

1992

# Doctor of Science in Computer Information Systems

Nova Southeastern University

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**CENTER  
FOR  
COMPUTER  
AND  
INFORMATION  
SCIENCES**

**DOCTOR OF SCIENCE IN  
COMPUTER INFORMATION  
SYSTEMS  
1992-1993**

## **Nova University Mission**

Nova University provides educational programs of distinction from prekindergarten through the doctoral level at times and in locations convenient to students, prepares students for leadership roles in business and the professions, encourages research and community service, and fosters an atmosphere of creativity and innovation utilizing technology where appropriate.

## **Center Mission**

Nova University's Center for Computer and Information Sciences (CCIS) is committed to the education of practicing professionals. The mission of the Center is to provide quality education, utilizing both traditional and nontraditional instructional delivery systems at the undergraduate and graduate levels in the computer and information sciences.

*Nova University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award bachelor's, master's, educational specialist, and doctoral degrees. Nova University admits students of any race, sex, age, color, nondisqualifying handicap, religion or creed, or national or ethnic origin.*

# The University

Nova University is a fully accredited, independent institution in its third decade of operation. Nova offers courses of study leading to the bachelor's, master's, educational specialist, and doctoral degrees in computer and information sciences, business, hospitality management, law, education, psychology, physical sciences, and social sciences. The Nova degree programs include a law school, which is approved by the American Bar Association and the American Association of Law Schools; an Oceanography Center; and the School of Psychology, which is approved by the American Psychological Association. Currently there are over 11,000 students enrolled throughout all programs and more than 33,000 Nova graduates who work and contribute with distinction to their businesses and professions worldwide. From the beginning, the University has distinguished itself by its innovative outlook, its unique programs that provide both traditional and nontraditional choices in educational programs, and its research in many fields aimed at solving the problems of immediate concern to humankind. Nova University's centers and programs share a common mission--to educate students for leadership roles in a variety of professions. Students develop a sense of professional ethics and responsibility and learn to appreciate the role of the professional as a key individual in society.

Nova programs stress the critical relationship between theory and practice; they reinforce and test classroom experience through applied research and industrial experience as integral parts of academic experience. Nova University extends its resources to provide educational opportunities to working professionals nationwide, with its faculty teaching at corporate and other locations across the country. Nova also delivers programs through a variety of educational technologies, including telecommunications. Nova University is committed to the idea that education should not be timebound or placebound. Through its educational offerings, research projects, and programs of public service, the University encourages the free exchange of ideas and the search for knowledge that is the cornerstone of the academic tradition.

## Center for Computer and Information Sciences

Nova University has become a major force in educational innovation. It is distinguished by its commitment to provide quality education to practicing professionals utilizing both traditional and nontraditional delivery systems. Innovation is reflected in the undergraduate and graduate programs offered by the Center for Computer and Information Sciences (CCIS).

Consistent with Nova's philosophy and mission, programs of the Center are designed to provide breadth and depth of knowledge as the basis for a quality education that keeps pace with rapidly changing professional and academic needs. Research activities stress a blend of theory and practice in an applied setting. Today, CCIS faculty and staff serve the educational needs of undergraduate and graduate students throughout the United States.

## **DOCTOR OF SCIENCE IN COMPUTER INFORMATION SYSTEMS**

This program offers a course of study leading to the degree of Doctor of Science (Sc.D.) in Computer Information Systems (CIS). The program produces technology-oriented professionals with knowledge in major areas of computer information systems and the ability to develop creative solutions to substantive real-world systems problems. Six major areas require work on a research project to bridge the gap between theory and practice.

The format of the Sc.D. in CIS Program is especially well-suited to professionals working in business, government, education, or industry who are involved with the design, implementation, management, maintenance, evaluation, and utilization of computer information systems.

The curriculum integrates information systems and computer science theory, technique, and methodology. Coursework in the CIS program focuses on an effective blend of current research and practice.

The four-year program requires courses and applied projects in these major areas:

- Structure of Computer Information Systems
- Database Management Systems
- Data Communications and Computer Networking
- Decision Support Systems
- Human-Computer Interaction
- Software Engineering
- Statistics, Research, and Design
- Artificial Intelligence

### **CURRICULUM**

In addition to allowing working professionals to pursue a systematic program of graduate study, the courses, research projects, and dissertation are specifically oriented toward the direct application of theory to professional practice.

The 68-semester hour program (48 semester hours of which are required subject courses and project courses) may be completed in four years, although students have seven years to complete the program requirements.

## **PROGRAM FORMAT**

The Doctor of Science in Computer Information Systems program operates on six-month semesters. Each student must complete eight core courses, six projects, a qualifying exam and a dissertation. During the first three years, the student is required to complete six major courses and six related projects. Each semester, one three-credit subject course and its related four-credit course project are taken concurrently. Each course and project requires six months to complete. Each semester, the student attends two seminars at Nova University, completes the requirements for the major course, develops a proposal for the project, and completes the project.

During the fourth year of the program, in addition to the final two courses, the student is required to pass a qualifying examination and present a dissertation. The dissertation is the main focus of the final year of study and is the most important requirement for the Sc.D. degree. Each student is expected, with the help and approval of an advisor, to select an appropriate topic of sufficient scope to satisfy this requirement. Students should produce results that advance knowledge and improve professional practice in the field of computer information systems.

Each Sc.D. candidate is required to attend four seminars per year at Nova University. Seminars are held quarterly, each on an extended weekend (Friday, Saturday, and half a day Sunday). Sc.D. courses are taught by distinguished full-time faculty and by distinguished computer and information systems professionals who generally hold the doctoral degree. The seminars are intense and demanding. In the months between seminars, students study the course material, complete assignments, read professional literature, prepare project proposals, and complete research papers and applied research projects. Between meetings, students communicate regularly with the faculty via electronic media.

Dissertation results must be sufficiently strong to be accepted for publication in a professional journal in the field. Although such publication is not a requirement for completing the Sc.D. degree, students are strongly encouraged to submit their dissertation research work for publication.

Students are responsible for their own lodging and travel expenses related to the seminars.

## **FIVE-YEAR COMBINED MASTER'S/DOCTORAL OPTION**

The Center for Computer and Information Sciences offers a five-year combined master's and doctoral option.

Students interested in this option must first be accepted into the master's program. Once students have completed eight courses (24 credits) in the master's program with a grade point average of at least 3.25, they may be accepted into the doctoral program. (Students must also fulfill all other doctoral admission requirements.)

Upon acceptance into the doctoral program and after the completion of 14 credits in the doctoral program, the student is awarded the master of science degree. These 14 credits also count toward the doctoral degree, thereby reducing the total time needed to acquire both degrees if they had been taken separately. Once admitted into the doctoral program, students follow the format that pertains to doctoral students. For more information about this option, write to the CCIS Program Office.

**DOCTOR OF SCIENCE  
IN  
COMPUTER INFORMATION SYSTEMS**

<b>Year*</b>	<b>Fall Courses</b>	<b>Year*</b>	<b>Spring Courses</b>
1992	Software Engineering Course: 3 credits Project: 4 credits	1993	Data Communications and Computer Networking Course: 3 credits; Project: 4 credits
1993	Decision Support Systems Course: 3 credits Project: 4 credits	1994	Statistics, Research, and Design Course: 3 credits Project: 4 credits
1994	Artificial Intelligence Course: 3 credits Project: 4 credits	1995	Database Management Systems Course: 3 credits Project: 4 credits
1995	Human-Computer Interaction Course: 3 credits Project: 4 credits	1996	Structure of Computer Information Systems Course: 3 credits Project: 4 credits
	Qualifying Examination (1) Dissertation Proposal (2): 10 credits		Dissertation Report: 10 credits Dissertation Defense

(1) The qualifying examination is a written examination administered at the beginning of the student's seventh semester. It covers the material presented in the first six courses.

(2) The dissertation must represent a significant contribution to knowledge in the field of computer information systems.

**\*Note:** The student may enter the program at the beginning of any semester. **The Course and project in each area are offered only once every four years.**

**MEETING DATES FOR 1992**

October 16, 17, 18 (Term beginning)  
December 4, 5, 6

**MEETING DATES FOR 1993**

March 6, 7, 8 (Term beginning)  
June 5, 6, 7  
September 10, 11, 12 (Term beginning)  
December 3, 4, 5

## ADMISSION

The Doctor of Science in Computer Information Systems Program is designed for students with a graduate degree in computer information systems, computer science, or a related area and meet the following requirements:

- A master's degree from a regionally accredited college or university representing completion of course work that fulfills prerequisites for doctoral work in one of the above areas
- A graduate GPA of at least 3.25.
- A portfolio with appropriate work experience and credentials
- Three letters of recommendation
- A completed application with application fee and official transcripts of all prior graduate and undergraduate work
- Satisfaction of graduate prerequisites or equivalent experience in:
  - Information systems
  - Programming languages
  - Database management systems
  - Systems analysis and design
  - Data communications and networks
  - Computer architecture
  - Statistics.

Students not fully satisfying the prerequisites or entry requirements will be asked to make up the deficiencies before being formally admitted to the doctoral program. (At the option of Nova University, students may be admitted on a provisional basis pending the completion of prerequisites.)

## READMISSION

Individuals on withdrawal status who wish to be readmitted must complete a new application form and be approved for readmission by the Admissions Committee for the Center for Computer and Information Sciences. Students dismissed from the Center for Computer and Information Sciences because of poor academic performance may not be readmitted, as stated in the grading policy.

## WITHDRAWAL POLICY

Students who wish to withdraw from the program--either temporarily or permanently--must inform the Admissions Office in writing to be eligible for allowable refunds. Students who give written notice of their intent to withdraw prior to the beginning of a seminar will not be assessed for subsequent courses until they are formally readmitted. Students who are readmitted are subject to the prevailing tuition rate.

## TUITION

Tuition is \$6,000 per year. There is a \$60 yearly registration fee. Included in the tuition are the course seminars and on-line computer time. Students must purchase their own textbooks. Tuition and fees are subject to change.

## TUITION PAYMENT POLICY

Tuition and fees may be paid by cash, check, money order, credit card or financial aid as authorized on an individual's official award letter. There are three options for tuition payment for those not on financial aid: Full Payment, Installment Payments, and Deferred Payment .

### Full Payment

Full payment of tuition can be made at the time of registration with no additional charges required.



# Administration

## PROGRESS RECORDS

The Center for Computer and Information Sciences maintains up-to-date progress records on each student. After each term, the University furnishes students with grade reports showing current status and all work completed and/or attempted.

## GRADING SYSTEM

Faculty for the Doctor of Science in Computer Information Systems program assign grades to courses and projects according to the following system:

Grade	Quality Points
A	4.0
B	3.0
C	2.0
F	0
I	Incomplete
W	Withdraw

Dissertations are assigned grades of Pass (P), No Pass (NP), Incomplete (I), and Withdraw (W).

### INCOMPLETE (I)

Indicates that the student has not completed the course requirements and that the instructor has given additional time to do so. An "I" grade is only assigned when there are extenuating circumstances to prevent completion of the course requirements.

Incompletes may be assigned at the discretion of the instructor at the request of the student. Should the instructor choose to assign an incomplete, an incomplete contract must first be completed and signed by the instructor and the student, with the original kept on record in the program office.

### WITHDRAW (W)

A grade of W may be assigned when the student officially requests a withdrawal (in writing) from the course, project, or dissertation no later than one month prior to the end of the term. A student may be administratively withdrawn if he or she fails to maintain continuous registration without a prior written request and approval from the program director.

### ACADEMIC STANDING

The grading policy for the doctor of science degree requires that the student maintain a minimum cumulative grade point average of 3.0. Failure to meet this requirement will result either in academic probation or dismissal as detailed below. Students who receive two FAIL grades will be dismissed from the program and may not be readmitted.

### PROBATION POLICY

Students failing to achieve a minimum of a 3.0 (B) grade point average are not eligible to receive the doctoral degree. Should a student's grade point average fall below 3.0 after the initial completion of four courses, he or she is placed on probation. The student is allowed one academic year to bring the grade point average up to the 3.0 minimum. Failure to achieve the minimum at that time results in dismissal from the program.

**Installment Payments**

When registering, students may elect an installment payment plan. This plan requires three payments spread over 90 days. The first payment of 50 percent of the total tuition is due at registration, 25 percent is due 60 days after registration, and the remaining 25 percent is due 90 days after registration. The charge for this option is \$50 and post-dated checks or credit-card authorizations for each installment must be submitted at the time of registration.

**Deferred Payment - Employment Tuition Reimbursement**

The deferred payment policy is for students eligible for company tuition reimbursement benefits. Proof of eligibility must be provided at the time of registration. A student choosing this option will pay 50 percent of the total tuition at the time of registration, with the remaining 50 percent due five weeks after the registration period ends. A deferment fee of \$50 must be paid at the time of registration.

Students who are not eligible for employer reimbursement (or who choose not to provide a letter confirming eligibility) continue to have all tuition and fees payable in full at the time of registration, or may choose the installment plan.

**REFUNDS**

Students notifying the Center of their intention to withdraw from the program prior to the beginning of a new term will be entitled to a full refund of all monies paid, with the exception of the \$40 nonrefundable application fee. If an applicant is rejected, all monies will be refunded except the \$40 application fee.

**Withdrawal Period with a Refund:**

Students who wish to receive a refund of tuition upon withdrawal from a term must submit a written request certified mail to the CCIS program office. The following schedule will apply:

100 percent refund:	a written request for withdrawal must be received within 14 days after the term begins.
50 percent refund:	a written request for withdrawal must be received after the 14th day but before the 30th day of the beginning of the term.
25 percent refund:	a written request for withdrawal must be received after the 30th day of the beginning of a term, but before the 60th day after the term begins.

NOTE: The registration fee is nonrefundable; therefore, the adjustments above are for tuition charges only.

## **GRADUATION REQUIREMENTS**

To be eligible for graduation, a student must fulfill the following requirements:

1. Successful completion of eight core courses and six projects with a cumulative GPA of 3.0
2. Successful completion of the qualifying exam
3. Successful completion of a dissertation
4. Completion of a graduation form at the time of registration for the student's final term of course work.

## **GRIEVANCES**

When questions about procedures, decisions, or judgments occur, counseling is available for discussion and resolution of differences. Students may also have recourse to more formal avenues of appeal and redress. An appeals policy is available upon request from the program director.

## **INTERNATIONAL STUDENTS**

International Student Advising Service  
(305) 370-5695 or (800) 541-6682, Ext. 5695

An international student applying to Nova University must (1) obtain a student (F) visa or an exchange visitor (J-1) visa (students are not permitted to study in the United States on a visitor (B-2) visa); (2) submit all secondary school and/or college-level transcripts (transcripts must be an official English language translation); (3) demonstrate the ability to meet all costs of his or her education without financial aid from Nova University; (4) purchase medical insurance (J-1 visas only); contact the international student advisor for further information concerning insurance; (5) demonstrate proficiency in the English language by submitting a minimum score of 550 on the Test of English as a Foreign Language (TOEFL) exam.

## **VETERANS' SERVICES AND BENEFITS**

(305) 370-5685 or (800) 541-6682, Ext. 5685

Nova University's academic programs are approved for the training of veterans and other eligible persons by the Bureau of State Approval for Veterans' Training, Florida Department of Veterans' Affairs. Eligible veterans and veterans' dependents should contact the Office of the University Registrar, 3301 College Avenue, Fort Lauderdale, Florida, 33314, or telephone (305) 370-5685 or (800) 541-6682, Ext. 5685.

## **FINANCIAL AID INFORMATION**

(305) 475-7411 or (800) 541-6682, Ext. 7411

Nova University offers several programs of student financial aid in order to assist the greatest number of its students possible in meeting educational expenses. In order to qualify and remain eligible for financial aid, students must be accepted for admission into a University program; be eligible for continued enrollment; be a United States citizen or in the U.S. for other than a temporary purpose; and be making satisfactory academic progress toward a stated educational objective in accordance with the University's policy on satisfactory progress for financial aid recipients.

## **RESEARCH FACILITIES**

The Center's doctoral and master's programs utilize the campus-based fiber-optic network to gain access to various computing resources. Library and other media resources are available electronically to computer-based students through the use of the electronic library and HYTELNET. The UNIX operating system provides a common base for research activities on microcomputers, minicomputers, and superminicomputers throughout the Center. The Center houses a lab of various computing resources, which include AT&T 3B2, Gould Power Node, and DEC RISC-based systems. In addition to the computing resources of the Center, students have access to University computing facilities including DEC minicomputers, IBM PC laboratories, and Apple Macintosh laboratories. Nova is a member of SURAnet and maintains a T-1 link to the Internet.

## **OTHER INFORMATIONAL PHONE NUMBERS**

### **Nova College Admissions (Undergraduate)**

Professional Studies (Day School)  
(305) 475-7360 or (800) 541-6682, Ext. 7360

Career Division (Night School)  
(305) 475-7034 or (800) 541-6682, Ext. 7034

### **Registrar's Office**

(305) 475-7400 or (800) 541-6682, Ext. 7400

### **Student Housing**

(305) 475-7052 or (800) 541-6682, Ext. 7052

# CCIS Degree Offerings

## **Doctoral and Professional Degrees**

Doctor of Education (Ed.D.) in:

Computer Education

Doctor of Science (Sc.D.) in:

Computer Information Systems

Computer Science

Information Systems

## **Master's Degrees**

Master of Science (M.S.) in:

Computer-Based Learning

Computer Information Systems

Computer Science

## **Bachelor's Degree**

Bachelor of Science (B.S.) in:

Computer Engineering

Computer Information Systems

Computer Science

Computer Systems

## **FURTHER INFORMATION**

To receive further information on the programs described in this catalog contact the Center for Computer and Information Sciences, Nova University, 3301 College Avenue, Fort Lauderdale, Florida 33314, (305) 475-7352 or (800) 541-6682, Ext. 7352.

## CENTER FOR COMPUTER AND INFORMATION SCIENCES FACULTY

Phillip M. Adams, Professor; Sc.D. Nova. Compilers, artificial intelligence and expert systems, operating systems, systems software, computer architecture.

Raymond Barrett, Assistant Professor; Ph.D. Florida Atlantic. Digital signal processing, modeling and simulation, and VLSI design.

Harvey Deitel, Professor; Ph.D. Boston. Operating systems, open systems, software engineering, computer networks, object-oriented design.

Jacques Levin, Professor; Ph.D. Grenoble (France). Database management, modeling and decision support systems, numerical analysis.

Edward Lieblein, Professor; Ph.D. Pennsylvania. Software engineering, object-oriented design, programming languages, automata theory.

Freeman Rawson, Visiting Professor; Ph.D. Stanford. Operating systems, artificial intelligence and expert systems

Edward R. Simco, Professor and Dean; Ph.D..Nova. Numerical analysis, modeling and decision support systems, operations research and statistics.

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

Raisa Szabo, Associate Professor; Ph.D. Budapest Technical. Computer architecture, artificial intelligence and neural networks, robotics and automated systems, operations research.

Clovis L. Tondo, Visiting Professor; Sc.D. Nova. Data structures, programming languages, object-oriented programming, compilers.

# DOCTOR OF SCIENCE IN COMPUTER INFORMATION SYSTEMS

## COURSE DESCRIPTIONS

### **DCIS 700 Statistics, Research, and Design (3 credits)**

An in-depth treatment of the research and evaluation process including design, measurement, and statistical analysis. Techniques for planning, designing, and conducting research and evaluation projects and collecting and analyzing data using various statistical techniques. Problem solving methods. Review of statistical analysis software.

### **DCIS 710 Decision Support Systems (3 credits)**

Principles and techniques relating to decision making, systems modeling, and support. Topics include decision theory, simulation, decision support system architecture, constructing a decision support system, executive information systems, and expert systems to support decision making in information systems.

### **DCIS 720 Human-Computer Interaction (3 credits)**

The multidisciplinary dynamics of human-computer interaction, theory of user interfaces and the relationship of user interface design to human-computer interactions, interface quality and evaluation, dimensions of interface variability, strategies for implementing effective human-computer dialogues, and computer-supported cooperative work.

### **DCIS 730 Structure of Computer 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.

### **DCIS 740 Data Communications and Computer Networking (3 credits)**

Data transmission encoding, interfacing, synchronization, data-link control, multiplexing, networking, circuit switching, packet switching, radio and satellite networks, local area networks, network access protocols, transport/session/presentation/application protocols, TCP/IP, OSI, and ISDN.

### **DCIS 750 Database Management Systems (3 credits)**

Theory and principles of databases and their management. Design, implementation, and traditional and non-traditional applications of database management systems.

### **DCIS 760 Artificial Intelligence (3 credits)**

Covers the theory of and major approaches to artificial intelligence including knowledge representation, heuristics, search, learning techniques, tools and techniques for applying artificial intelligence, and knowledge-based expert systems.

### **DCIS 770 Software Engineering (3 credits)**

The development of software-intensive systems, quality factors and principles related to software engineering, system life-cycles, requirements definition and analysis, behavioral specification, design, implementation, verification and validation, system evolution, project management.

### **DCIS 800 Advanced Topics and Project in Statistics, Research, and Design (4 credits)**

Students complete a statistically-based research project in computer information systems and prepare a research report that includes the following: an account of the research problem and its significance, a review of the literature and related studies, a description of the methods and procedures for data collection and analysis, and an interpretation of the research findings.

**DCIS 810 Advanced Topics and Project in Decision Support Systems (4 credits)**

Students advance their knowledge through the completion of a research paper or project in the area of decision support systems. Some topics of current interest include comparisons of decision support aids, the relationship between decision support systems and expert systems, DSS hardware and software, group DSS, distributed DSS and data communications, and human problem solving through DSS.

**DCIS 820 Advanced Topics and Project in Human-Computer Interaction (4 credits)**

Students complete a research paper or project that examines, in depth, a current topic in HCI such as HCI modeling, interface quality and evaluation, computer system and interface architecture, social aspects of computing, legal and ethical aspects of computing, and computer-supported cooperative work (CSCW).

**DCIS 830 Advanced Topics and Project on Structure of Computer Information Systems (4 credits)**

Students pursue a research project, implementation, or simulation study on a current topic in computer information systems. Some topics of current interest are: distributed information systems, information systems management, security, enterprise models, evolution models, technology transition, real-time systems, manufacturing systems, and system simulation.

**DCIS 840 Advanced Topics and Project in Data Communications and Computer Networking (4 credits)**

Students pursue a research project, implementation, or simulation study on a current topic in data communications and/or computer networking. Some topics of current interest are client/server computing, internetworking, network management, ONC, DCE, DME, TCP/IP, OSI, and ISDN.

**DCIS 850 Advanced Topics and Project in Database Management Systems (4 credits)**

Students pursue a research study on a current topic in database systems or complete a database-oriented development project. Some areas of current interest include: object-oriented database systems, extended relational DBMS, deductive and logic-based expert database systems, federated or heterogeneous database systems, other high-performance parallel database systems, and advanced conceptual logic database modeling.

**DCIS 860 Advanced Topics and Project in Artificial Intelligence (4 credits)**

Students pursue a research project or implementation on a current topic in artificial intelligence. Some topics of current interest are natural language processing, understanding, parallel and distributed AI, expert systems, and connectionist models such as neural networks.

**DCIS 870 Advanced Topics and Project in Software Engineering (4 credits)**

Students pursue a research study in a current topic in software engineering or complete a software engineering development project. Some topics of current interest include object-oriented analysis and design, software/system life-cycles, reusability, specification, and verification.