1988

Computer-Based Doctoral and Master's Programs for Professionals Delivered Through UNIX 1988

Nova Southeastern University

NOVA

UNIVERSITY

Computer-Based Doctoral and Master's Programs for Professionals Delivered Through UNIX*


HOLLYWOOD CENTER

Nova University's computer-based graduate programs are the direct result of the high technology information age in which we now live.

The Center for Computer-Based Learning serves as a university-wide resource in the field of computer science and telecommunications to assist in providing a new breed of leaders--professionals who are prepared to lead in the rapidly expanding information society. With the advent of Nova's "teleport" and new developments in telecommunications and satellite technology, the University itself has taken the lead in technologically-based education. The mission of Nova University emphasizes the importance of alternative delivery of education through technology and telecommunications, and the CBL is a major vehicle for supporting this work.

The CBL was established to facilitate an electronic community at Nova University in which faculty and students can share ideas, work cooperatively on projects, and advance in their professions through research and development activities. The electronic community is a new concept in learning. It promotes the application of computer tools and utilities to improve instruction, improves communication among participants in the learning environment, and enhances the overall effectiveness of education within the University.

The work of professionals is heavily involved with information. The explosive increase in the quantity of that information has created a demand for persons trained in information management skills, and it has placed pressure on the professions to respond by training their own members in information handling techniques. To name a few, the professions of law, information management, medicine, engineering, education, and the sciences have felt the need to provide additional training in the information and computer science fields to their constituencies.

A WELCOME

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Director, Training and Learning
Acting Director, Information Systems

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RATIONALE AND MISSION

Nova University works to meet these demands through its cadre of field-based and computer-based graduate programs.

In three fields, information science, information systems, and the vast area of training, a major problem has developed: the growth in technological tools for information handling and the escalation in the rate of growth of information itself have outstripped the rate with which professionals are able to maintain competency. This situation is aggravated by two conditions: the public's demand for more knowledge and the demand on organizations to understand their environments in new ways. The first condition has been brought on by the computer revolution, and the second was generated by the forces of international competition, especially the rise of industrial giants like Japan and Germany. Nova University works to meet these demands through its cadre of field-based and computer-based graduate programs.

Today, the computer is a necessary tool for knowledge workers. Much of the work in the information specialities, and in the field of training, is being accomplished using computers. Using the computer effectively is necessary for success in these fields. Nova University's philosophy is that it makes sense to use the student's natural work environment for learning.

The doctor of arts degree (D.A.) was designed originally for professionals in higher education and training. Today, the D.A. degree is granted in a wide range of disciplines in over fifty universities across the county. It has been viewed as a viable path to renewal and professional growth for practitioners who seek a terminal degree. The Nova D.A. degree program is a challenging opportunity for professionals who want to learn more about the new technologies while at the same time applying those technologies to earning credit in a graduate degree program and in their jobs.

Nova University offers the D.A. program in a field-based mode because of its experience with doctoral level programming. The University currently operates graduate programs in many states across the country. The rationale for field-based programs was stated by Dale Tillery of the University of California, Berkeley in his presentation before the National Board of Graduate Education:

"As in the clinic, the courts, and the laboratory the arena for much professional learning is in the daily life of real institutions. Why demand that the student leave these natural laboratories for the lecture hall or the seminar room? It makes more sense to import the theoretical and scholarly components to this real world than to deport the student from the very settings in which he needs to gain and refine new insights, sensitivities, and skills. This recognition of the great learning possibilities in professional settings need not result in provincialism or in self-confirmation."

To this day, Tillery's comments continue to justify the delivery of instruction to the professional's locale--in the field-based mode. In the D. A. program, the electronic link between student and professor couples the strengths of the field-based mode of delivery with telecommunications for a continuous interchange of ideas. The resulting environment for learning helps make the education of knowledge workers and information professionals a more meaningful and enriching experience. In this way Nova University expects to produce the leaders for the emerging information society.

Students interested in earning their master's degree online at Nova University can enroll in the master of science program. This master's degree is also delivered through a telecommunications format. The degree requires 18 to 24 months to complete and 36 semester hours of academic work. There are five specialities available: Training and Learning, Information Resource Management, Information Systems, Adult Education, and Electronic Education.

UNIX* Via Telecommunications: The Online Frontier

By
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Abstract

The authors describe their experiences with several computer-based online doctoral and master's programs that use the UNIX* operating system for delivery. These experiences include use of modems, terminal emulators, packet switching networks, teleconferencing, online tutoring, large statistical analysis packages, database management utilities, CAI authoring systems, and writing improvement tools. The advantages, challenges, and problems inherent in the use of modern technology based upon these experiences with the UNIX operating system suggest ways that educators can use telecommunications to improve learning. Several "next steps" for the use of telecommunications in education are suggested.

*Unix is a trademark of AT & T and Bell Laboratories

INTRODUCTION

The Role of the Electronic Community

W. Stanley Brown of Bell Laboratories, in a presentation at the American Library Association Annual Meeting of 1983 in Los Angeles, set the stage for online work of this nature. Brown called the futuristic collection of emerging computer and telecommunications technologies "electronic communities." His model contained four major categories: file systems (writing tools, electronic mail, computer conferencing, bulletin boards, and calendar aids); databases (bibliographic, historical, and scientific); advanced services (online ordering, news, and weather); and network services (file transfer, virtual terminal access, and cooperating processes). At the heart of all this was the UNIX operating system developed at Bell Laboratories by Ken Thompson and Dennis Ritchie. Following Brown's lead, Nova University's computer-based programs have grown into a true electronic community of teachers and students. To reach the frontier, a student needs only to dial a local Tymnet number and log-in to UNIX.

The computer-based programs at Nova depend heavily on microcomputers, modems, and telecommunication networks in conjunction with a supermini computer host. Students from across the country conduct their online classwork in coordination with lecturers who teach the seminars. Students complete their online work using the tools of UNIX, and complete their offline assignments using a personal computer with a word processor and other utilities.

There are many benefits derived from online participation in the electronic community. These stem from the UNIX system's ability to network a vast array of resources for communication and information processing. The benefits include--

1. Electronic mail that speeds communication and gives rapid feedback on learning problems, reduces paperwork, allows storage and retrieval of student records, and helps provide a better understanding of policies and procedures.

2. Computer conferences that support discussion of issues and concepts before seminars, allow contributions on topics over a period of weeks or months, provide a means for program development and evaluation. Nova has several modes of computer conferencing that include the Notesfile system (from PLATO designed at the University of Illinois) to several home-grown systems ranging from simple shell scripts to complex real time-group "talk" systems written in the C programming language.

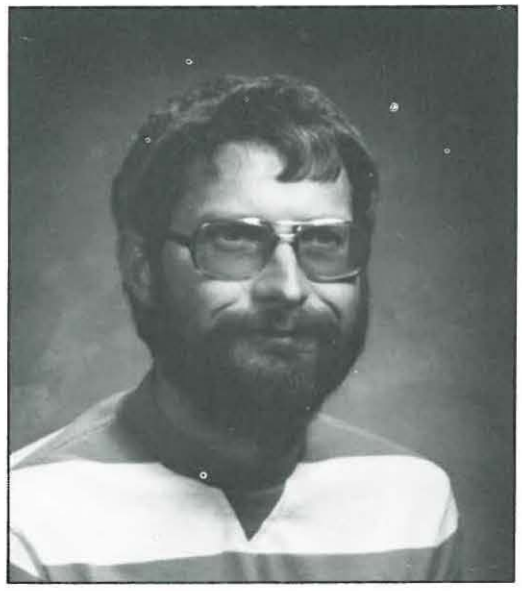
3. UNIX tools that support rapid retrieval of information required for learning and writing-improvement tools that enhance communication.

4. Computer-assisted instruction that provides rapid feedback to students and a log of students' progress. The LEARN CAI system in UNIX applies its own CAI style to teaching users about UNIX. The Instructional Workbench has been added to the list of programs that can be used for lesson and course design.

5. An online environment that provides an ideal setting for students to share completed projects (databases of approved practicum proposals, completed practicums, and major field projects).

The electronic community idea has been implemented fully in the computer-based graduate degree programs of Nova University. The availability of telecommunications networks, sophisticated software, and affordable personal computers makes these programs a reality today. Now, the programs are able to blend naturally with the real world environments: electronic communication, networking of resources, word processing, and interlibrary loan servicing through electronic mail. The reduced costs of mounting a national effort of this kind came about within this decade. The role of UNIX in supporting the entire program should not be discounted, and Brown's organization, AT&T Technologies (Bell Laboratories), can take credit for both UNIX and Dr. Brown.

In line with its role as a developer of alternative delivery systems, in 1983, Nova University introduced a computer-based doctor of arts in information science degree (DAIS) that was based on students'



"Nova University's MSTL program has allowed me to work full time and pursue a Master of Science degree at the same time. I have found the program to be both stimulating intellectually and practical to my occupation. The Nova faculty have been quick to answer questions and have been very supportive of my efforts. The work has been challenging and interesting, with more student interaction than is often found on a traditional college campus. The ability to work at my own place and have the power of the mainframe computer makes this style of education unique and great fun. I am satisfied that I made the decision to join the Nova CBL program."

Larry Van Pelt, MSTL, Nevada

"I believe that professionals ought to be able to avail themselves of interesting, relevant, high-quality graduate education that can be applied directly to their job situations. That's exactly what I've found at Nova after doing lots of looking around. I work full time and travel more than half the time, yet I can 'go to school' whenever and wherever I can find a computer and modem. There's lots of student-professor dialogue and I get quick feedback to questions and assignments. It's great!"

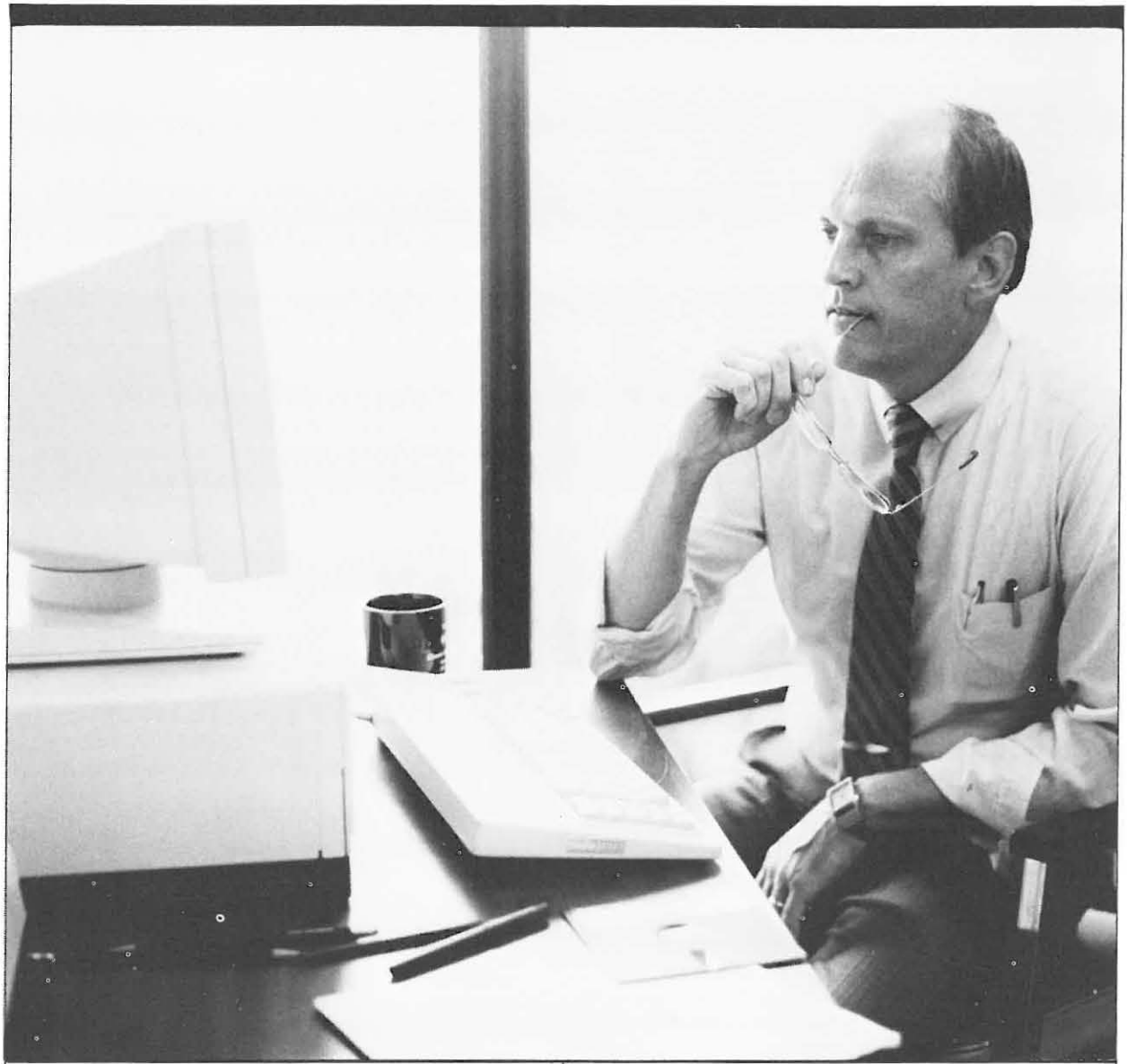
Martha Lane, MSTL, Pennsylvania

use of a personal computer, modem, and regular telephone lines. Students made connection online with a campus-based mainframe computer, central staff and faculty on the main campus, and fellow students across the country. In 1984, two additional doctorates were developed and offered: the doctor of education degree in computer education (CED-72 credit hours) and the doctor of arts in training and learning (DATL-67 credit hours). Each is a three-year program. In early 1986, the first pilot students began the master of science in computer-based learning program, and now the first students in the educational specialist program have begun work toward their degrees.

The delivery system that was developed includes eight major components: 1) face-to-face seminars (cluster meetings and extended weekend at the Summer Institute); 2) study guides with readings and assignments; 3) online communications with faculty and fellow students; 4) computer-assisted instruction online via a supermini computer; 5) online conferences in each study area to discuss issues related to the area; 6) online transmission of assignments and receipt of feedback from instructors; 7) final exams in each study area taken in person at the seminar or institute meetings; and 8) field-based action research projects known as practicums.

Students begin work, after acceptance into the program, by learning how to communicate within the operating system on the Nova University VAX-11/780 host computer using the Tymnet long distance packet switching system. They upload and download files and papers that they create offline using their own home personal computer.

To make these programs work, a host of questions had to be answered about the curriculum, the faculty, the delivery process, the hardware and software, and the students themselves. The university-wide curriculum committee and the Academic Council had to be satisfied that the quality of the programs would be maintained and that the programs would be financially viable. In attempting to answer these questions, it was found that a great deal was being learned by trial and error. Lessons learned in the first doctoral program were used in the next program, and so on. Some of the lessons learned were also used in an undergraduate offshoot of the program and a proposal is now being prepared for the K-12 laboratory school so that group can benefit from the lessons being learned. It seems reasonable that other institutions are going to be exploring this approach to education and this article will help document some of the experiences here so that others can benefit from the initial work being done.



The following is a brief description of three of the doctoral programs, three of the master's programs, and the four-year combined master's and doctoral program options offered by the Center of Computer-Based Learning through the electronic community.

Doctor of Arts Programs

The three doctoral programs in Training and Learning (DATL), Information Systems (DIS), and Information Science (DAIS) are quite similar in format.

The entry requirements include a master's degree in the major field of study, a portfolio of work that demonstrates competency at the doctoral level, and appropriate letters of recommendations. If the master's degree is not in the major field of study, work experience will be evaluated by the Center for Computer-Based Learning on a case by case basis. In addition, students need a personal computer and modem to access the Tymnet system.

Once online, students begin their initial orientation to telecommunications and the UNIX operating system. In the doctor of arts programs, students meet quarterly for a weekend at a "cluster location" in their part of the country. All students in a cluster begin together and move through the program as a unit. However, due to the individualized nature of the medium, students can set their own working pace within the general time framework.

Doctor of Arts Programs
Common Structure

The doctor of arts program consists of five 5-credit core courses with their module of expertise (MOE). Two speciality courses are taken on campus during the Summer Institute as part of an extended weekend. The program also requires two practicums (i.e., real-world, problem-solving activities using computers or telecommunications to help solve the problems identified).

The core courses are--

1. Computer-Based Research and Statistics;
2. Database Management Systems;
3. Human Factors in Software Design;
4. Strategic Management;
5. Systems Analysis, Expert Systems, and Artificial Intelligence.

Each core course consists of two weekend seminars taken in the field, with core assignments and an area of specialization called a module of expertise (MOE), both completed online. The common part of the course awards three credits, the MOE awards two credits, resulting in a total of 5 credits for each core course. The first seminar is devoted to the common part of the course. The second seminar is devoted partly to reviewing the common course, partly to preparing the student for the MOE. Each core course is completed by an examination taken at the first seminar of the following course.

Students are required to complete online assignments in a set of generic content fields, as well as to specialize in one area of each course, the module of expertise (MOE). For example, in the Strategic Management course, students have a choice of specializing in leadership, marketing, strategic planning, finance and budgeting, or the management of information technology. Whatever the speciality, students are expected to demonstrate leadership skills in addressing significant improvements in their work environments.

Summer Institute (On campus specialities in the extended weekend format) --

The Summer Institute will be the occasion for the student to become acquainted with Nova University and the Center for Computer-Based Learning faculty. Each Summer Institute will carry a theme highlighting emerging advanced technology.

Specialty courses will be taken by students on campus during the first extended weekend (3 days, July 22 - 24, 1988). Registration for the extended weekends will take place on Thursday evening. At this meeting, advanced technology will be presented by vendors and manufacturers. Students will also participate in formal classroom activities and share in informal activities on campus. The Summer Institute speciality courses are listed for D.A.T.L., D.I.S., and D.A.I.S. programs in the course descriptions.

Doctoral Program Course Sequence

	six months	six months	Summer On-Campus ext. Week-End
YEAR #1	Research/Statistics core (3 credits) and MOE (2 credits)	Database Management core (3 credits) and MOE (2 credits)	Specialty 1
	Practicum Proposal #1 (4 credits)	Practicum Proposal #1 (4 credits)	
YEAR #2	Expert Systems core (3 credits) and MOE (2 credits)	Strategic Management core (3 credits) and MOE (2 credits)	Specialty 2
	Practicum Proposal #2 (4 credits)	Practicum Proposal #2 (4 credits)	
YEAR #3	Human Factors core (3 credits) and MOE (2 credits)		
	Major Field Proposal (10 credits)	Major Field Project (10 credits)	

UNIX Training Workshop

For the student who is not proficient in the UNIX operating system, the Center for Computer-Based Learning offers two ways to learn UNIX:

1. On-campus UNIX training workshops
2. Preseminar UNIX training workshops

Students receive training on how to log in on the Nova UNIX computer system and how to use UNIX commands and applications available online. Demonstrations and actual hands-on experiences are provided to students who attend the on-campus UNIX training workshop. Additional UNIX workshops are scheduled on Friday afternoons before seminars at the Nova main campus in Ft. Lauderdale and at other off-campus locations.

The following dates are for the UNIX workshop on campus:

On-Campus Workshop
Dec. 4-5, 1987
Jan. 15-16, 1988
Feb. 19-20, 1988
Apr. 22-23, 1988
June 10-11, 1988

On-Campus Pre-Seminar Workshops
Jan. 22, 1988
April 29, 1988

Off-Campus Pre-Seminar Workshops
Wilmington (DE)
Feb. 5, 1988
May 6, 1988

St. Louis (MO)
Feb. 12, 1988
May 13, 1988

California (CA)
Feb. 26, 1988
May 20, 1988

"Nova University's DATL program provides an innovative solution to my needs for graduate study in telecommunications and training. The courses are well planned and provide a flexible structure that closely parallels my current professional needs as well as being future-oriented. The faculty and student support systems are excellent. The high quality faculty-student interchange of ideas and learning found in Nova's Graduate program cannot be matched by traditional graduate programs. The faculty support and advising at Nova is what other universities dream about."

Walter Deal, DATL Virginia

Doctor of Arts in Information Science

The D.A.I.S. program is designed for professionals in public, academic, and special libraries; school media centers; and business, government, and corporate information centers. The program's emphasis is on professional training and is intended for professionals acquiring, handling, and transmitting information and decision relevant data.

The D.A.I.S. student will acquire knowledge through a combination of core courses, modules of expertise (MOE), and speciality courses. Students must complete five core courses (two cluster site seminars for each course) with five modules of expertise (taken online with an expert in the field) and two specialty courses (taken during an extended weekend seminar). The extended weekend will be scheduled during the summer as part of the Summer Institute. The modules of expertise (MOE) include the following:

1. Research Methods in Information Science
   (Corequisite core course);
2. Information Retrieval and Dissemination
   (Corequisite core course);
3. Strategies for Human/Machine Interface in Information Science
   (Corequisite core course);
4. Finance and Budgeting, Tools and Techniques in Information Science
   (Corequisite core course);
5. Applications of Artificial Intelligence and Expert Systems in Information Science
   (Corequisite core course).

The D.A.I.S. program consists also of two speciality courses taken on campus (an extended weekend at the main campus). The on-campus speciality courses for the D.A.I.S. program include--

1. Telecommunications;
2. Emerging Technologies in Information Science.

As in other CBL doctor of arts programs, students are required to complete two practicums, a major field project, and a comprehensive examination. In-person seminar sessions as well as online presentations are given.

Doctor of Arts in Training and Learning

The D.A.T.L. program is based on the premise that training personnel today are managers of information. In this context, their role has been similar to the information scientist. Students in this program take a core of courses in common with the D.A.I.S. and D.I.S.. (See Core Courses above)

The new demands on specialists in the computer-based training field require them to collect the "right" information and package it in a form that leads to effective training programs. Students in the D.A.T.L. program also take five modules of expertise (MOE). These courses carry two hours of credit and are presented online. The modules of expertise (MOE) include the following:

1. Data Analysis for Training and Learning (Corequisite core course);
2. Relational Databases in Organizations (Corequisite core course);
3. Design of Human Interfaces (Corequisite core course);
4. Finance and Budgeting in Training and Learning (Corequisite core course);
5. Artificial Intelligence and Expert Systems for Training and Learning (Corequisite core course).

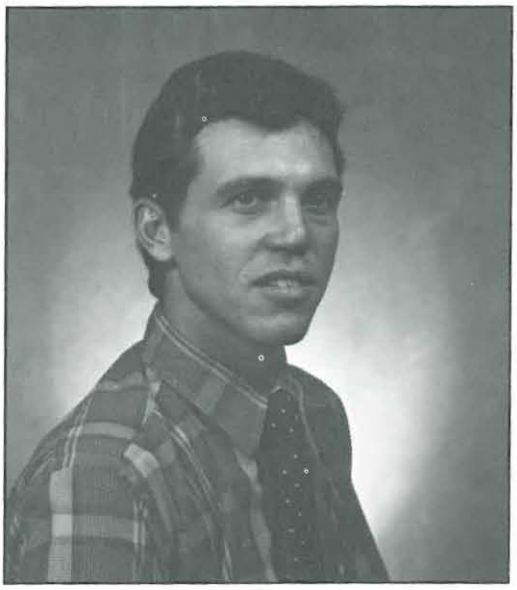
The D.A.T.L. program consists also of two speciality courses taken on campus (an extended weekend at the main campus). The on-campus speciality courses for the D.A.T.L. program include --

1. Software and Courseware Design for Computer-Based Learning;
2. Emerging Computer and Information Technologies for Training and Learning Design.

As in other CBL doctor of arts programs, students are required to complete two practicums, a major field project, and a comprehensive examination. In-person seminar sessions as well as online presentations are given.

"The DAIS program at Nova University is possibly the most innovative program in a university setting. My professional growth as an educator and information specialist was enhanced by this doctoral program. I would highly recommend any of the Computer-Based Learning programs at Nova. The DAIS program offered the opportunity to explore new and exciting technological advancements and to concentrate on areas of interest to the individual or to solve work related problems using technology as the springboard." (Grad – 1987)

Penny Brown, DAIS, Florida



"The DAIS program at Nova University is one of the truly innovative programs in the country. It offers librarians, school media specialists and information managers the opportunity to obtain skills in data communications and information storage and retrieval. In my three years in the program I progressed to a confident and knowledgeable manager of information technologies. Through Nova, I was able to learn the electronic techniques so vitally important in the changing world of information science."
(Grad – 1987)

Paul Catano, DAIS, Rhode Island

Doctor of Arts in Information Systems

The D.I.S. program is designed for professionals and managers in business, government, or industry, who are involved in computer-based information processing. The program's emphasis is on professional training and is offered for practitioners working in information fields such as computer centers and information centers.

The information systems student will acquire knowledge through a combination of core courses, modules of expertise, and speciality courses. Students must complete five core courses (two cluster site seminars for each course) with five modules of expertise (taken online with an expert in the field) and two specialty courses (taken during an extended weekend seminar). The extended weekend will be scheduled during the summer as part of the Summer Institute. The modules of expertise (MOE) include --

1. Data Analysis for Information Systems (Corequisite core course);
2. Relational Databases in Organizations (Corequisite core course);
3. Design of Human Interfaces to Information Systems (Corequisite core course);
4. Finance and Budgeting in Information Systems (Corequisite core course);
5. Artificial Intelligence and Expert Systems for Decision Support Systems (Corequisite core course).

The D.I.S. program consists also of two speciality courses taken on campus (an extended weekend at the main campus). The on-campus speciality courses for the D.I.S. program include --

1. Planning and Policy Formulation In Management Information Systems;
2. Emerging Computer and Information Technologies for Information Systems Design.

As in other CBL doctor of arts programs, students are required to complete two practicums, a major field project, and a comprehensive examination. In-person seminar sessions, as well as online presentations are given.

Master of Science in Computer-Based Learning:

The Center for Computer-Based Learning offers master's programs in Training and Learning (MSTL), Information Systems (MIS), Information Resource Management (MIRM), Adult Education (AE) and Electronic Education (EE). The entry requirements include a bachelor's degree from a regionally accredited institution, a portfolio of work that demonstrates competency at the master's level, and appropriate letters of recommendations. In addition, students need a personal computer and modem to access the Tymnet system.

Once online, students begin their initial orientation to telecommunications and the UNIX operating system. In the master of science programs, students meet once a year for a week-long institute on Nova's main campus, during the summer, but there are many ways for the students to keep in contact with the faculty other than through telecommunications:

- going to the UNIX training workshops offered on Nova's Main Campus,
- going to the UNIX preseminar workshops offered at one of the cluster sites in the United States,
- participating during the FICC convention in Orlando, in discussions and classes.

This degree requires 18 to 24 months to complete and 36 semester hours of academic work. The master of science degree consists of a common core of eight courses and a specialization area of four courses, including a practicum proposal and a practicum report that focuses on the area of specialization. In addition, master's students are required to attend two 1-week summer institutes during the program.

In all computer-based programs, students work extensively at home with a personal computer preparing assignments and projects for transmission online. They also contact their professors online and participate in electronic conferences and attend electronic classroom presentations. There are several electronic tools online in the UNIX system that all students must master as well.

When students meet at seminars or institutes, they attend formal class presentations and interact with fellow students and the staff. They also use this time together to take exams in each study area to validate their online work and to demonstrate mastery of the content in the study area. Nationally known scholars, practitioners, and other experts give presentations at these meetings in addition to the formal classes.

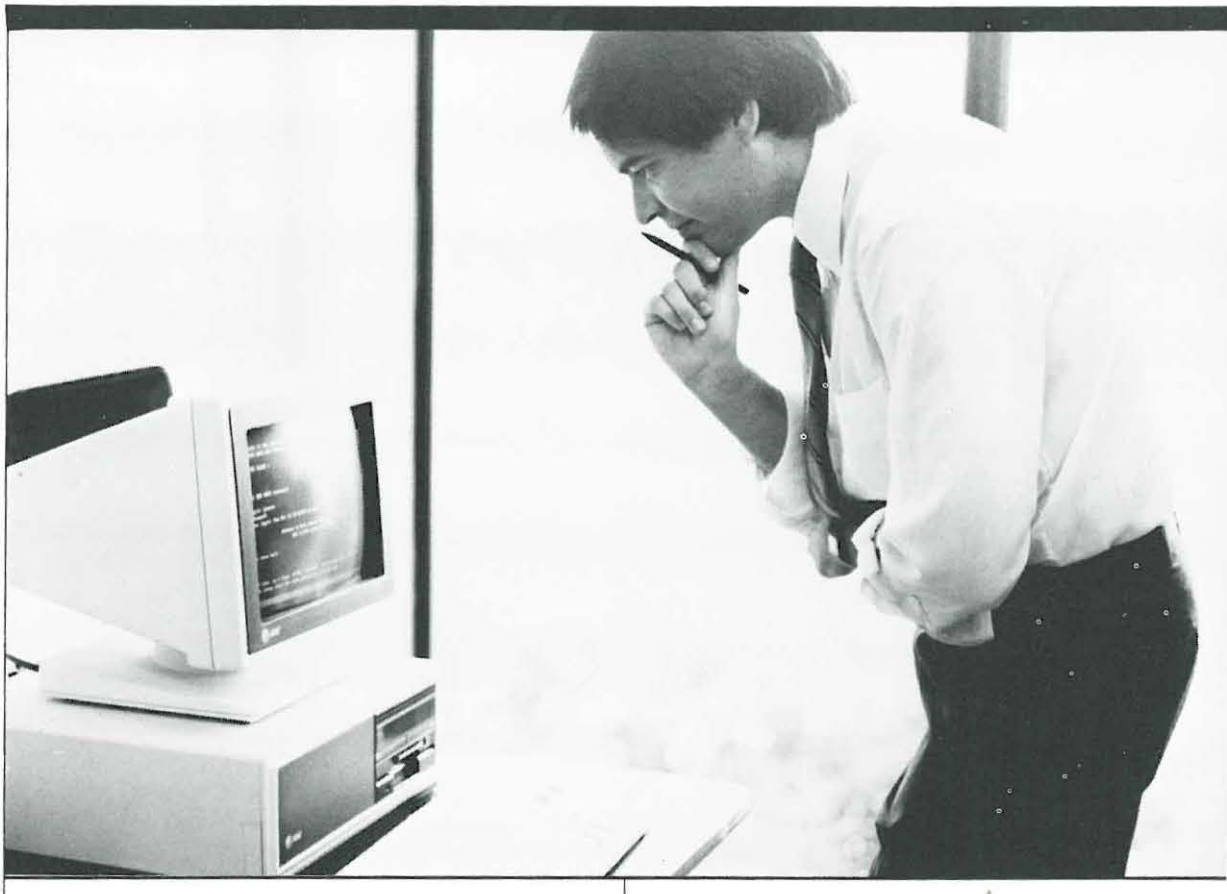
Master of Science Course Sequence:

First Year:

Term	Winter	Spring	Summer	Fall
	Digital Computers (3 credits)	Database Management (3 credits)	Specialty #1 (3 credits)	Statistics (3 credits)
	Systems Analysis (3 credits)	Strategic Management (3 credits)	Case Analysis (3 credits)	Human Factors (3 credits)

Second Year:

Term	Winter	Spring	Summer	Fall
	Practicum Proposal (3 credits)	On Line IS Info System (3 credits)	Specialty #2 (3 credits)	Practicum Report (3 credits)



The first year, students are advised to register for two courses per term. The second year, students may either register for one or two courses per term, provided they want to get their master's degree within two years or 18 months.

Common core and specialization courses in the master of science program include the following:

COMMON CORE COURSES

1. An Introduction to the Digital Computers and Telecommunication
2. Online Information Systems
3. Statistics, Measurement and Quality Control
4. Theory of Human Factors
5. Database Management Systems
6. Systems Analysis
7. Strategic Management and Finance
8. Case Analyses

Courses in the specialization areas include the following:

Training and Learning (TL) Specialization:

1. Practicum Proposal in Training (Part I)
2. Practicum Report in Training (Part II)
3. Courseware and Software Design (offered on campus during the Summer Institute)
4. Emerging Technologies in Computer-Based Training (offered on campus during the Summer Institute)

Information Systems (MIS) Specialization:

1. Practicum Proposal in MIS (Part I)
2. Practicum Report in MIS (Part II)
3. Project and Planning of Information Systems (offered on campus during the Summer Institute)
4. Emerging Technologies in Information Systems (offered on campus during the Summer Institute)

Information Resource Management (MIRM) Specialization:

1. Practicum Proposal in MIRM (Part I)
2. Practicum Report in MIRM (Part II)
3. Telecommunications (offered on campus during the Summer Institute)
4. Emerging Technologies in Information Sciences (offered on campus during the Summer Institute)

Adult Education (AE) and Electronic Education (EE) Specialization:

1. Practicum Proposal in Adult Education or Electronic Education (Part I)
2. Practicum Report in Adult Education or Electronic Education (Part II)
3. Introduction to Structured Programming in Pascal (offered on campus during the Summer Institute)
4. Advanced Computer Programming in Pascal (offered on campus during the Summer Institute)

Master's / Doctoral Four Year Option:

The Center for Computer-Based Learning offers a four-year combined master's/doctoral option in training and learning, information science, or information systems. After completing 24 semester hours in the master's program, students with good standing may be accepted into a corresponding CBL doctoral program. Upon completion of 12 semester hours in the doctoral program, students will be awarded the master's degree. Students choosing the four-year master's/doctoral option can save up to six months to complete both degrees.

Doctor of Education in Computer Education

The doctor of education in Computer Education (Ed.D./CED) is a program with the same qualifications as the doctor of arts program offered by the Center for Computer-Based Learning except that the master's degree may be in any area. Teachers and educators should contact the Center for Advancement of Education for more information.

"In addition to equipping me with new skills to work in today's information environment, the credential will provide increased recognition as my college strives to add more doctorate degrees to its faculty. I am proud to be associated with an institution of Nova's caliber where programs are delivered by a scholarly faculty of national and international acclaim and where immediate feedback is received."

Evelyn Bonner, DAIS, Alaska

The UNIX operating system, serves as the host environment for all online work.

ONLINE UTILITIES: A RAPID OVERVIEW

UNIX As An Environment for Learning

There are several good reasons why UNIX was selected for use in the programs at Nova University. The obvious reason is that it is a powerful system that has been tested by thousands of Bell Laboratories employees for almost two decades, and it works well. UNIX has over 300 commands that can be used by students as they acquire the generic skills needed to function in the complex information environments of the 1980 s. The UNIX system promises hope for professionals in meeting the challenges posed by the diverse and complex information problems of modern organizations.

The UNIX operating system, developed by Bell Laboratories, serves as the host environment for all online work. Application packages used by students in the program include relational databases, statistical tools, simulation languages, and numerous search and retrieval tools. All assignments, practicums, and dissertations (major field projects) are uploaded to the host machine where they are stored in online database for future reference by faculty and students. UNIX provides utilities to integrate the computer into the teaching/learning process in ways vastly different from the traditional classroom environment. In the UNIX environment, the student maintains a high degree of control of his or her own learning. The positive attributes of the UNIX environment are--

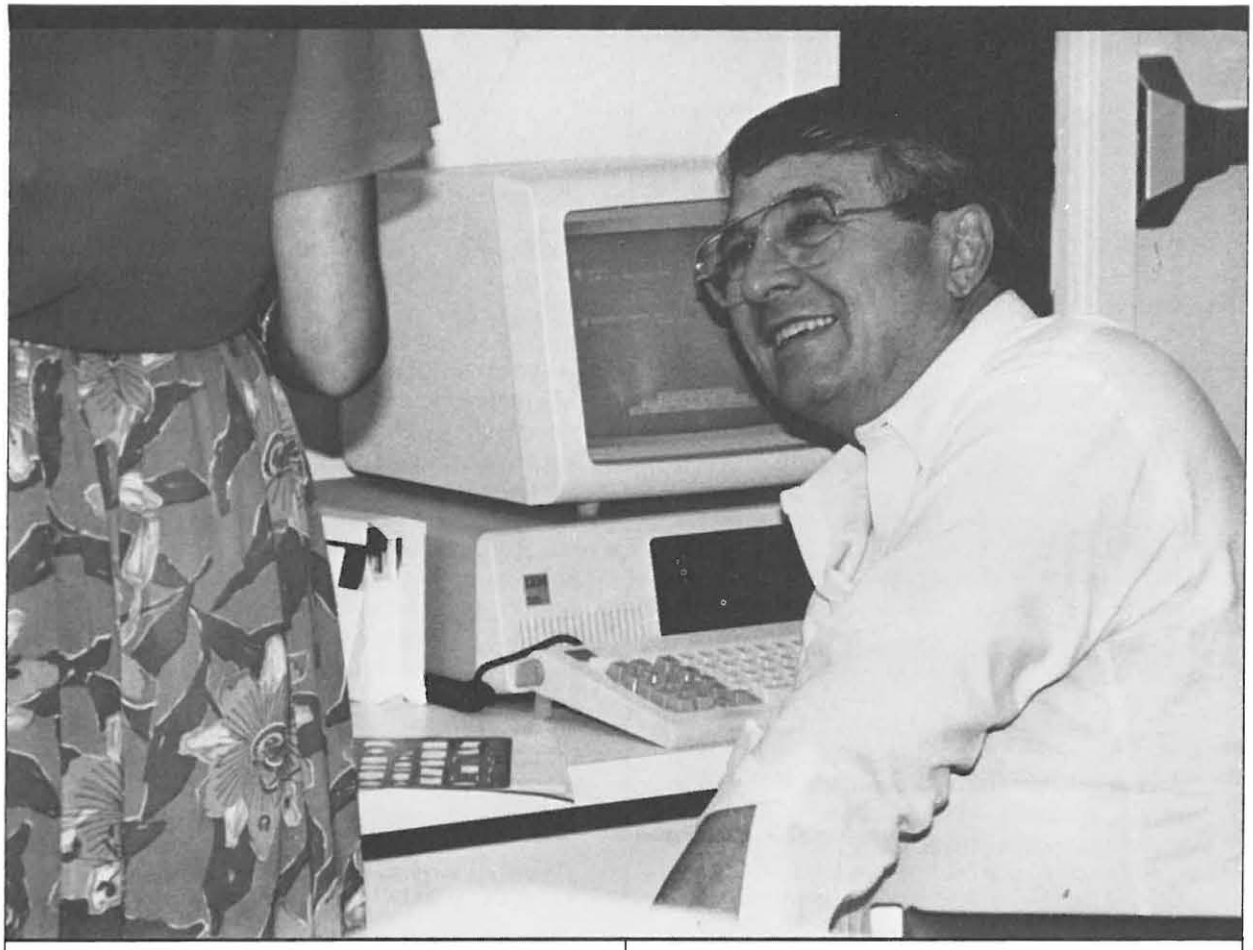
1. It integrates the tools of information science into the learning situation in a continuous process;
2. It provides a high degree of independence for students while permitting monitoring and control by program staff;
3. It provides opportunities for exploration, design, and creativity with novel forms of tools, processes, and systems.

The UNIX system provides a built-in computer-assisted instruction (CAI) utility that presents the basics of the system to students through scripts or lessons. Bell Laboratories named this CAI system "LEARN." LEARN is a CAI authoring system and is used to develop customized scripts for the programs. New students are encouraged to take all the LEARN courses available in the system. An online manual describing each command can be accessed, and a user friendly menu system has been developed that presents several options for CAI.

In addition to LEARN, our UNIX system supports the AT&T Instructional Workbench (IWB). The IWB is an authoring system designed especially for UNIX. It includes menu systems, lesson templates, and test templates, as well as a system for managing student progress. The IWB comes equipped with courses about the UNIX operating system that can be used for a basic introduction to work online.

A UNIX laboratory has been established on the Nova campus with various microcomputers and terminals connected by direct lines and modems to Nova's VAX. The lab is used to introduce students to the system in a hands-on, coaching manner. The lab is used extensively by all students enrolled in computer-based programs.

UNIX is both the message and method of delivery, and this presents some problems. For example, in the course on digital computers in information science, students explore the tools and application programs of UNIX, but to do so students should be comfortable moving about



within the UNIX environment. To accommodate a wide variety of learning styles and beginning competencies a series of menu driven options was created. These options are included in a general menu that leads the student through a series of other menus and to the menus accompanying the seminar conferences.

Electronic mail is a key utility in delivering the program. Students send all assignments, receive all feedback, and communicate with their peers and their instructors through electronic mail. On log-in the students are notified if mail has been delivered during their electronic absence.

The mail utility provides a way for one user to transfer files to any other user on the system. The electronic community extends to all parts of the University. For example, the president of Nova University is an active user and enjoys discussing academic matters online with students and faculty.

All course assignments are available both online and in study guides for each course. Much of the work on assignments is done offline and then uploaded to the student's home directory. Later, assignments are mailed (electronically) to the proper destination or directory. Assignments are designed to require extensive manipulation of text or data by the many application programs in UNIX, and all text submitted to Nova must be treated by the appropriate tools of the Writer's Workbench (WWB). This paper has been analyzed by WWB programs and formatted with a UNIX program called nroff.

A computer conference is conducted before each seminar. Each conference follows a common format: a conference "seed" solicits comments on a given topic; comments are entered by students through a menu driven program; indexes and other commands are used by students to read responses.

UNIX provides many methods for students to communicate directly with their peers and their professors. One provides a split screen--the top half for the user and the bottom for the individual receiving the message. The other method is less attractive but useful for users who lack a cursor control feature for their screens. A recent addition called "phone," not only provides the split screen feature

but enables several users to hold "conference calls" online. In this utility, users have their own window; and it is possible for users to issue commands to UNIX without leaving the phone conversation.

In addition, UNIX provides a hierarchical file system that is tree shaped and contains special files called directories that contain lists of file names. By developing their own tree structures, students can organize information in novel ways. UNIX provides many tools for data management without the need for special software additions.

Group participation online is made possible by a program called Electronic Classroom (ECR). This utility enables a classroom atmosphere to prevail online. The Electronic Classroom uses the "curses" cursor motion modules of UNIX to display a lecture window and a student attendance/question window. The attendance window displays a list of user codes of students who have logged into the ECR, and it also shows how students are responding to questions asked in the true/false or multiple choice modes (only the instructor can view these student responses). The text of the lecture is presented by an instructor through the 16 x 80 window at the top of the screen. The instructor can read in text from UNIX files or display the output of commands run in the UNIX shell. A student can ask a question at any time during the lecture, and the instructor is notified of this through the appearance of a question mark to the left of the questioner's name. A question window is made to appear by the instructor, and in it appears the text of the question typed in by the student. All students can see the content of both the lecture and the question windows.

Finally, the student's learning environment on UNIX contains a host of application packages for such as editors, statistical tools, database management systems, and language compilers and interpreters. Students are required to do their own analysis of problems in statistics through use of S and SPSS (two of the most powerful online statistical tools available in the world today). Prolog is used by students in many assignments dealing with artificial intelligence and several expert system shells are available online for building expert systems. The online environment is truly a "show-me" world in which one survives through hard work and intelligent use of time and tools.

In the online programs a steady flow of information moves to and from the students. Information management skills are necessary just to survive online. Acknowledgement of receipt of assignments, evaluative feedback, record keeping, tutorial interactions, and practicum reviews must be done with conservation of time and storage space in mind. Considerable thought goes into shaping the online community to its regular members. These online utilities make it possible for students to amplify skills that would otherwise lie dormant or underutilized. A host of expert systems tools has been developed by the staff to cope with the high volume of student work transferred in each day.

THE FUTURE OF TELECOMMUNICATIONS

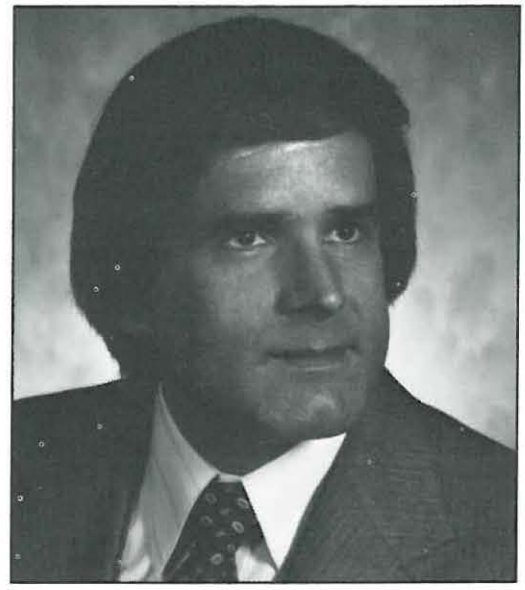
There are at least five recurring issues in online work that will continue to pose challenges for educators. These points are issues because the telecommunications field, as well as the students who come to learn, are changing continuously. Institutions must learn to cope with this change and provide environments that satisfy needs of learners with the most effective and efficient technology available. Students will demand no less, and we should not settle for less. These issues are--

1. Educational institutions should investigate alternate ways of getting computers into students' hands rather than purchasing the hardware for them. The problems of maintaining computers in operating condition for novice users far outweigh the advantages of encouraging new student participation. This aspect of entry level literacy in any educational program is crucial to success in telecommunications-based learning.
2. Online learning does not work the same for all students. The small samples used in early studies indicate complex interactions between learning styles and online work.

3. The computer-based learning environment must be modified regularly through systems programs to allow staff and faculty to adapt to changing student needs.
4. Faculty must have both traditional classroom skills and computer competencies to be effective.
5. Since the cost of personal computers and the cost of access to telecommunication nets have dropped significantly, the hardware and software choices made by institutions are more important than ever before; more alternatives are now available. The decisions will get even harder to make in the future. Obviously, help from computer hardware and software professionals is necessary in making these decisions as the alternatives continue to grow and the speed with which the decisions must be made increases.

At Nova University a great many lessons about online learning and the electronic community have been learned. A few of these lessons have been outlined above, and many more will be learned in the future. Any educational institution that enters into an electronic community must be prepared to make sacrifices to accommodate students. For example, to be effective the electronic community requires attention twenty-four hours a day. Different time zones and varied work habits of students can produce novel demands on professors and administrators. Therefore, professors and administrators involved in the electronic community must also be willing to work more and different hours from those found in the traditional workload standard.

Similar obligations fall on students. Students who do well online appear to have learning styles that give them the self-motivation and the stamina needed to complete complex tasks. Obviously, determination of this ability is helped by other parameters such as aptitude for computer work, high tolerance for ambiguity, and traits that fall in the realm of personality. Preliminary data show that many factors contribute to the ways students adapt to online environments.



"By enrolling at Nova, I have been able to learn about state-of-the-art instructional technology by using and applying state-of- the-art instructional technology. I have maximized my learning and study times; established dynamic telecommunication dialogues with faculty, national lecturers and colleagues regardless of geographical location; and have created and capitalized on a strong interface between my world of work and my world of education."
(Grad – 1987)

Alan White, DATL Virginia

Success in learning through telecommunications, however, will probably be determined (as usual) by teachers committed to hard work and their willingness to go beyond what is expected of them. Students who approach learning through telecommunications links will get no special treatment, but just more hard work. Both students and teachers will have to be aware of the new demands made by these new opportunities; the faint of heart need not apply. Life on this frontier is full of both its burdens and its rewards.


IBM
COMPLAIA.BAK
MENUP.BAK
MENUBAR.BAS
FORMAT.COM
MENU01.OVR
HANDBK
STUDENTS
BASICA.COM
SYS.COM
WORKSHOP.SSS
HANDBK.BAK
STUDENTS.BAK
CHKDSK.COM
WS.COM
INSTITUT
TERRES
COMMAND.COM
CORRSTAR.OVR

NOVA UNIVERSITY

CENTER FOR COMPUTER-BASED LEARNING
3301 College Avenue
Fort Lauderdale, Florida 33314
(305) 475-7047

OFFICE USE ONLY

Program
Cluster Code _____
Academic Unit _____
Admit Status _____
Major Code _____ Initial ___
Copy Made _____
(Sate)

ADMISSIONS APPLICATION

Center For Computer-Based Learning

MESSAGE TO THE APPLICANT:

Please send the completed form along with your $30 nonrefundable application fee. Then submit your portfolio, transcripts, and letters of recommendations to complete your application.

Expected Starting Date_____/_____/_____ Location_____
Mo. Day Year

Soc. Sec. No _____/_____/_____ Sex: ( ) M ( ) F Date of Birth _____/___/___
Mo. Day Year

_____
Last Name First Name M.I. Maiden Name

_____
Legal / Permanent Address: Street & Number Apartment

_____(___)_____(___)_____
City State Zip Home Phone / Business Phone
Ext._____

_____
Mailing Address While Attending Nova (Local) City State Zip

EMERGENCY Contact:

_____
Name

_____(___)_____(___)_____
Address Home Telephone Business Phone

ACADEMIC GOAL:

CHECK ONE:

The Doctor of Arts in:
- ☐ Information Science
- ☐ Training & Learning
- ☐ Information Systems
- ☐ Four-year combined Masters & Doctoral

Master of Science in CBL:
- ☐ Training and Learning
- ☐ Info Resource Management
- ☐ Information Systems
- ☐ Adult Education
- ☐ Electronic Education

Please list all colleges and universities attended. Official transcripts showing all graduate work are required.

Send them to: Nova University
Center for Computer-Based Learning
3301 College Avenue
Ft. Lauderdale, FL 33314

Name of College/University	State	Date Started (Mo/Yr)	Date Ended (Mo/Yr)	Major Field	Degree	G.P.A

Do you intend to transfer any graduate level credits toward your master's degree?
_____Yes _____No If yes, list: Course number, title, institution, and dates:

_____

_____

_____

CITIZENSHIP STATUS:

___U. S. Citizen

___Non-resident Alien

___Resident Alien

Do you require an I-20? Yes _____ No _____

If you have a visa, indicate Status Code _____

Country of Citizenship _____

Native Language _____

Additional procedures are required for admission of non-resident alien students.

ETHNIC ORIGIN DATA: (This information is required for reporting purposes only)

Check one of the following:

___White Not of Hispanic Origin

___Black Not of Hispanic Origin

___Hispanic Origin

___Asian or Pacific Islander

___American Indian or Native Alaskan

APPLICANT STATUS AT TIME OF APPLICATION:

First time attending Nova University? ___Yes ___No

CENTER - SPECIFIC DATA:

a. Employment:
Job Title_____

_____(_____)_____
Employer Name Address Telephone

Essay: Please describe your reasons for pursuing this degree. Include the nature of work that you expect to be involved in after graduating from the program and your long-term goals. Why did you decide to apply to Nova? (Please continue on another page if necessary.)

HOW DID YOU FIRST HEAR ABOUT THIS PROGRAM?

☐ Colleague/Friend ☐ Advertisement ☐ Flyer or Announcement ☐ Conference
☐ Employer ☐ Nova Staff ☐ College Professor or Counselor ☐ Direct Mail
☐ Nova student or graduate ☐ Educational Directory
☐ Professional Publication (e.g., Barron's or Peterson's)

☐ Other_____

Specify_____

(over)

FINANCIAL AID:

Have you applied for Financial Aid? _____ Yes _____ No

Have you filed a College Scholarship Service Financial Aid Form (F.A.F.)?
_____ Yes _____ No

If yes, when was the F.A.F. sent to Princeton, N.J.? _____
Date

Are you eligible for V.A. benefits? Yes☐ No☐

To the Applicant:

Pursuant to the Family Education Rjights Privacy Act (Buckley Amendment) enacted on December 31, 1974, ☐ I DO, ☐ I DO NOT give permission for my name and/or address and phone number to be used for promotional purposes.

_____ _____
Applicant Signature Date

I declare that the above information, to the best of my knowledge, is complete and accurate. I agree to abide by all rules and regulations of Nova University.

_____ _____
Applicant Signature Date

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 practices a policy of nondiscrimination in employment and admission. Nova University does not discriminate on basis of race, color, age, sex, religion or creed, national or ethnic origin, or handicap.

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RECOMMENDATION FOR ADMISSION

DOCTOR OF ARTS IN:
- INFORMATION SCIENCE ☐
- TRAINING AND LEARNING ☐
- INFORMATION SYSTEMS ☐
- FOUR YEAR COMBINED MASTERS & DOCTORAL ☐

MASTER OF SCIENCE IN CBL:
- TRAINING & LEARNING ☐
- INFORMATION RESOURCE MANAGEMENT ☐
- INFORMATION SYSTEMS ☐
- ADULT EDUCATION ☐
- ELECTRONIC EDUCATION ☐

Name of Applicant _____

Institution or Organization _____

TO THE APPLICANT: One of the forms should be completed by an administrator or supervisor who can indicate the nature of your performance. Three recommendation forms are required.

TO THE EVALUATOR: The individual named above has made application to the Doctor of Arts or Master of Science program. One of the steps in the admissions process requires each applicant to obtain three letters of recommendation from administrators or supervisors denoting that the applicant has performed satisfactorily in his or her work. The items listed below concern the applicant's performance on the job. Your appraisal of the applicant will be used to help determine if the chosen program is appropriate for this person. Please rate the applicant on the following items:

1. Attitude toward work _____
   Somewhat negative — Average — Positive
2. Motivation toward work _____
   Low — Average — High
3. Ability to carry out tasks _____
   Low — Average — High
4. Resourcefulness in identifying and carrying out tasks _____
   Low — Average — High
5. Emotional Control _____
   Unstable — Usually well-balanced — Always well balanced
6. Interpersonal Relationship _____
   Avoided — Tolerated by others — Well liked by others

7. Most significant strength _____

_____

8. Most significant weakness _____

_____

9. I have known the applicant for _____years. The applicant has been a member of my staff_____years. I have known him/her well_____,slightly_____.

10. In my opinion, the candidate's potential for success in a doctoral program of studies is: Good_____, Average_____, Poor_____. I am unable to rate the candidate_____.

11.. In my opinion, the candidate has the ability to carry out effectively an institutional or organizational research project: Yes_____, No_____.

12. I have observed the candidate's work on institutional or organizational projects and find the product: Good_____, Average_____, Poor_____, Unknown_____.

13. The candidate works effectively with administrators or supervisors at his institution or organization. Yes_____, No_____.

14. The candidate has been involved in innovative projects at his institution or organization. Yes_____, No_____.

Date_____ Signature _____

Name_____

Title _____

Institution or
Organization_____ Department _____

MAILING ADDRESS: Admissions Office
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Nova University
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PORTFOLIO FORM

NAME _____

ADMISSIONS PORTFOLIO FORM*

1. EMPLOYMENT HISTORY (Specific job descriptions and dates)

2. GRADUATE COURSES FOR CREDIT

*Provide documentation or examples of any of the following items that you feel necessary to support your portfolio.

3. WORKSHOPS, SEMINARS, CONFERENCES, AND SPECIAL MEETINGS (List Topics)

4. PUBLICATIONS, PROPOSALS, AND REPORTS YOU HAVE AUTHORED

5. MAJOR IMPROVEMENT PROJECTS OR INNOVATIONS YOU HAVE INSTITUTED IN YOUR INSTITUTION OR ORGANIZATION

6. AWARDS, ACHIEVEMENTS, OR SPECIAL RECOGNITION YOU HAVE RECEIVED

7. OFFICES HELD IN PROFESSIONAL ORGANIZATION

8. HOW MANY TIMES HAVE YOU RUN FOR OFFICE?_____

9. COMMUNITY INVOLVEMENT (Clubs, churches, committees, etc.)

10. EXPERIENCE WITH AUTOMATED SYSTEMS OR COMPUTERS (Micro, mini or mainframe--describe the nature and length of the experience)

11. WHAT COMPUTER EQUIPMENT DO YOU HAVE AVAILABLE FOR USE IN THIS PROGRAM? (terminals, mainframes, microcomputers, etc.) Also indicate the types of operating systems you have used on these machines.

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3301 College Avenue, Fort Lauderdale, Florida 33314, 305/475-7047

TRANSCRIPT REQUEST FORM

STUDENT: To Request a Transcript from your past school to nova University. Fill in the blanks on both parts.

Dear Alma Mater:

Please send an official transcript of my academic work while attending your institution to Nova University. Return the form below to Nova University.

A. I attended your school from_____ to_____.

B. While in attendance my name on your records was:

_____

Last First Middle/Maiden

C. My student identification number was: _____

Thank you for your assistance.

Sincerely,

_____

Signature

DEAR ALMA MATER: PLEASE RETURN THIS FORM WITH TRANSCRIPT, THANK YOU

TRANSCRIPT TRANSMITTAL FORM

Social Security # _____ Date_____

Name_____

Last First Middle/Maiden

City _____ State_____ Zip_____

PLEASE SEND_____ COPIES TO NOVA PROGRAM: _____

Indicate Program Applied For

NOVA UNIVERSITY
CENTER FOR COMPUTER-BASED LEARNING
3301 College Avenue, Fort Lauderdale, Florida 33314, 305/475-7047

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City _____ State_____ Zip_____

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Indicate Program Applied For

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Ft. Lauderdale, FL 33314

National and Broward (305) 475-7047
Florida WATS (800) 432-5021 Ext. 7047