



MEMORANDUM

TO: President Edward T. Foote II

FROM: *X* David L. Wilson *David L. Wilson*
Chair, Faculty Senate

DATE: June 23, 1998

SUBJECT: Faculty Senate Legislation #97009(B) – Establishment of the Bachelor of Science in Information Technology Degree

The Faculty Senate, at its meeting on February 23, 1998, voted to approve the establishment of the Bachelor of Science in Information Technology degree (FS #97009(B)). on the condition that the College of Arts and Sciences and College of Engineering Deans would present a report to the Senate as to the resolution of remaining issues. The proposal is attached for your information.

This legislation is now forwarded to you for your action.

DLW/b


cc: Provost Luis Glaser
Dean K. Subbaswamy, College of Arts and Sciences
Dean M. Lewis Temares, College of Engineering
Dr. Tzay Young, Chair, Electrical and Computer Engineering

7/1/98
David,
✓ approved.
Thanks.
[Signature]



FACULTY SENATE COMMITTEE REPORT
on the
Department of Electrical and Computer Engineering
Bachelor of Science in Information Technology Proposal

Respectfully submitted
January 13, 1998
by

Dr. John F. Stewart 
Computer Information Systems Department
Chairman

Dr. Deborah Mash
Department of Neurology

Dr. Victor Milenkovic
Department of Mathematics and Computer Science

Dr. Michael Sacks
Department of Biomedical Engineering

1. RECOMMENDATION: The Committee is pleased to recommend that the Faculty Senate approve the Bachelors in Science degree program in Information Technology (IT) submitted by the Department of Electrical and Computer Engineering (EEN). This recommendation is unanimous.
2. DISCUSSION: The Committee has reviewed the IT proposal submitted by EEN. Over the last several months, the proposal has undergone significant change based on recommendations made by Committee members. A copy of the most important sections of the final proposal are attached to this letter for your review.

In addition to considering the merits of the proposal, discussions were held with the Deans of Engineering, and Arts and Sciences, to try to coordinate the computer related offerings in the program with those of the Department of Mathematics and Computer Science (Math&CS). In the past there has been conflict between these two departments related to duplication of course offerings and faculty capabilities. A framework for an agreement to resolve these issues, proposed by Dean Swamy and based on a common course designation, has been accepted by the EEN and Math&CS faculties. Although it may take several months to work out all

Department of Computer Information Systems
P.O. Box 248818
421 Jenkins Building
Coral Gables, FL 33124-6540
305-284-6105 Office
305-284-5161 Fax

Intelligent Computer Systems Institute
P.O. Box 248235
421 Jenkins Building
Coral Gables, FL 33124-6546
305-284-5195

UNIVERSITY OF MIAMI

Bachelors of Science in

Information
Technology

at

**Department of Electrical and
Computer Engineering**

College of Engineering

the modern information infrastructure. These factors have created a significant number of job opportunities for information technologists.

Consequently, a large force of skilled graduates will be needed who are aware of a variety of aspects of information technology including techniques for encoding, storage, communication, manipulation and use of information in digital form.

2.1 Distinguishing Aspects of Program

Information Technology differs significantly from typical Computer Engineering and Science (CES) programs. In addition to computing, Information Technology places emphasis on computer connectivity, communication, system integration, interactive multimedia design, network computing, agent technology, information modeling, information processing, high performance computing, and technology deployment. It encompasses the full range of human communications including animation, simulation, virtual reality, video and sound. In the area of telecommunications, it places a new emphasis on broad bandwidth communication to establish a richer interface between humans and information.

2.2 Information Technology Education

The information technology education offered by this program will go beyond that of being a means of transferring technical education to students. It will provide them with tools that will enable them to discover, formulate and then solve real life problems that enterprises face.

The nature of complex problems in modern organizations requires an information technologist to systematically analyze problem areas to determine the most efficient cost-effective solutions. The overall design of the curriculum, and teaching methodologies will be geared towards building student skills in two related areas: Analysis of requirements and group problem solving in an information technology society. The students will gain the capability of solving real life challenges based on their understanding of Object Oriented analysis techniques, and experience in solving real life problems through group interactions. (See Appendix 2: Letter from Industry)

The program also includes a background in mathematics, physics, and humanities and social sciences, some knowledge in Electrical Engineering (i.e. telecommunications and digital signal processing), and experience in design. A broad background in science and engineering will enable students to understand the "big picture" of information technology infrastructure and help them adapt to future developments in the field.

3. IT Program at College of Engineering, UM

3.1 Exact Title of Degree

Bachelor of Science in Information Technology.

3.2 Assessment of Demand and Job Market

There is a great demand for individuals with a broad knowledge of modern information technologies. The market place has shown the necessity for this program with the placement of computer engineers and computer scientists and the high salaries companies are willing to pay to attract quality individuals. Further enhancements in information technologies are expected to further proliferate information

Table 1: Budget Analysis in 1997 Dollars

Budget Year	1998-99	1999-00	2000-01	2001-02	2002-03
Revenue					
Estimated Enrollment	10	23	36	50	50
Tuition generated	\$180,000	\$414,000	\$648,000	\$900,000	\$900,000
Financial Aid (27%)	\$48,600	\$111,780	\$174,960	\$243,000	\$243,000
Net Revenue	\$131,400	\$302,220	\$473,040	\$657,000	\$657,000
Expenses					
Faculty (Salary & FB)		\$90,000	\$90,000	\$180,000	\$180,000
Part-time staff (Salary & FB)			\$15,000	\$15,000	\$15,000
Teaching assistants (Inc. Tuition)		\$24,000	\$24,000	\$48,000	\$48,000
Equipment & Operating Costs	\$10,000	\$20,000	\$30,000	\$30,000	\$30,000
Total Expenses	\$10,000	\$134,000	\$159,000	\$273,000	\$273,000
ECE Costs/Net Revenue	7.6%	44.3%	33.6%	41.6%	41.6%

4. Faculty

Name	Specializations
Dr. Mansur R. Kabuka	Information Technology and Medical Informatics
Dr. John W. Collins	Object Oriented Programming and Artificial Intelligence
Dr. Christos Douligeris	Telecommunications and Computer Networks
Dr. Philip S. Liu	VLI Design, Computer Architecture, and Object Oriented Programming
Dr. Moiez A. Tapia	Fault Tolerance, and Object Oriented languages.
Dr. Saeed A. Rajput	Information Integration, Telecommunications, and Software Engineering
Dr. Michael S. Scordilis	Digital Signal and Speech Processing
Dr. Tzay Y. Young	Computer Vision, Image Processing and Pattern Recognition

We have the assurance of the administration that we have two faculty lines in information technology. We plan to recruit additional faculty members in the area of information technology when the enrollment reach the target as proposed.

The departments of Mathematics / Computer Science and Electrical and Computer Engineering have worked with their respective deans to develop a joint relationship. There will be a joint coordinating committee as stated in the draft agreement attached (Appendix 1). Thus, the IT students will have access to both CE and CS faculty, and to an expanded selection of courses.

6. Curriculum

Bachelor of Science in Information Technology

A. General

	Course Title		Credits
	Social Sciences/Humanities Electives		18
ENG 105	English Composition		3
ENG 107	Scientific Writing		3
MTH 110	Calculus I		5
xxx 111	Introduction to Engineering I		3
xxx 112	Introduction to Engineering II	Pre: xxx 111	2
MTH 112	Calculus II	Pre: MTH 110 or 111	4
PHY 205	University Physics I	Pre: MTH 110, 111 or 131	3
PHY 207	University Physics III	Pre: PHY 205, MTH 112 or 132	3
PHY 209	University Physics III Lab	Pre or Co: PHY 207	1
MTH 210	Vectors and Matrices	Pre: MTH 112 or 132	3
	Subtotal		48

B. Required Courses

	Course Title		Credits
EEN 118/ MTH120	Introduction to C and Software Engineering		3
EEN 201	Electrical Circuit Theory	Pre or Co: MTH 112	3
EEN 304	Logic Design		3
EEN 307	Linear Circuit & Signals	Pre: EEN 201	3
MTH 309	Discrete Mathematics I		3
IEN 311	Applied Probability and Statistics	Pre or Co: MTH 112 or 132	3
EEN 312	Microprocessor	Pre: EEN 304	4
EEN 315	Digital Design Lab	Pre: EEN 304	1
EEN 317/ MTH 220	Algorithm and Data Structure in C++	Pre: EEN 118/MTH 120	3
EEN 400*	Internet & Intranet: JAVA Computing	Pre: EEN 317/MTH 220	3
EEN 404	Communication Systems	Pre: EEN 307	3
EEN 414	Computer Organization and Design	Pre: EEN 304	3
EEN 424*	UNIX Systems and Servers	Pre: EEN 317/MTH 220	3
EEN 436	Digital Signal Processing (DSP): Multimedia Approach	Pre: EEN 307	3

7. Semester by Semester Table

Bachelor of Science in Information Technology

FRESHMAN YEAR

FIRST SEMESTER

MTH 110 Analytic Geometry & Calculus I	5
ENG 105 English Composition I	3
xxx 111 Introduction to Engineering I	3
EEN 118/ Introduction to C and Software	3
MTH120 Engineering	
Socio-Humanistic Elective	3

SECOND SEMESTER

MTH 112 Calculus II	4
PHY 205 University Physics I	3
ENG 107 Writing about Science	3
xxx 112 Introduction to Engineering II	2
Socio-Humanistic Elective	3
EEN 304 Logic Design	3

17

18

SOPHOMORE YEAR

FIRST SEMESTER

EEN 201 Electrical Circuit Theory	3
PHY 207 University Physics III	3
PHY 209 University Physics III Lab	1
MTH 309 Discrete Mathematics I	3
EEN 317/ Algorithms and Data	3
MTH 220 Structure in C++	
EEN 315 Digital Design Lab	1
Socio-Humanistic Elective	3

17

JUNIOR YEAR

FIRST SEMESTER

EEN 436 Int. to Digital Signal Processing	3
EEN 414 Computer Organizat. & Design	3
CIS 520 Analysis of Information Syst.	3
EEN 570 Network Client-Server Prog.	3
EEN 523 Princ. of Database Systems	3
Adv. Socio-Humanistic Elective	3

18

SENIOR YEAR

FIRST SEMESTER

EEN 572 Distributed Systems & Object-Oriented Database Mgmt.	3
EEN 571 Interactive Multimedia Comp	3
EEN 534 Computer Comm. Networks	3
Elective	3
Elective	3

15

SECOND SEMESTER

EEN 404 Communication Systems	3
EEN 424 Unix Systems & Servers	3
EEN 512 Object-Oriented Software Eng.	3
CIS 524 Design of Information Systems	3
Socio-Humanistic Elective	3

15

SECOND SEMESTER

EEN 573 Network Computing: The New Enterprise	3
Elective	3
Senior Project	3
Adv. Socio-Humanistic	3

12

Grand Total = 128 credits

9. Information Technology Options

Examples

Machine Intelligence

EEN 537/MTH 545	Artificial Intelligence
EEN 553	Neural Networks
EEN 548	Machine Learning
EEN 574	Agent Technology

Multimedia

EEN 538	Introduction to Digital Image Processing
EEN 571	Interactive Multimedia Computing
MTH 529	Introduction to Computer Graphics
EEN 540	Speech and Audio Processing

Others

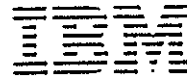
Return-path: <azame@bellsouth.net>
Date: Thu, 11 Dec 1997 17:04:03 -0500
From: Alan Zame <azame@bellsouth.net>
Subject: cs/ce framework
To: swamy@miami.edu
Organization: University of Miami

We have approved the version of the framework that follows. There are some differences with engineering's version, and an additional section. We feel very strongly that the common designation must be "CSE". In fact, Stewart himself objected to the CES designation for, if nothing else, being too much like "CIS".

1. Use the common designation CSE for all courses pertaining to computer science or computer engineering. The catalog will list all CSE course in a single location along with descriptions of the CS and CE programs and a list of faculty who have taught or teach these courses. To the extent that it becomes necessary, the deans will ensure that tuition revenue by the two units are appropriately tracked and credited.
2. Appoint a committee made up of two faculty from each department (to be appointed by the two deans in consultation with the respective chairs) who, along with the respective chairs will jointly coordinate CS/CE course schedule and course changes.
3. The degree programs continue to reside where they currently reside. Each CSE course is assigned a "home" department based on the nature of the content; CSE courses will be distributed equitably between the two departments. The content of a course that serves as a requirement to a degree that is in the other college will be determined by mutual agreement of the relevant faculty in the two departments, paying attention to national standards and relevant accreditation requirements.
4. All qualified regular faculty in both departments may teach the CSE courses, but must adhere to the agreed upon syllabi. The course schedule for each semester will be prepared jointly by the coordinating committee. Any disagreements will be referred to the two deans. The assignment of non-tenure track faculty to teach courses should be carefully monitored by both deans to assure high quality for the courses.
5. Both colleges will coordinate their student recruitment efforts for the computing degree programs.
6. The coordinating committee will make recommendations to the respective departments as to the most desired area needed to fill a vacancy.
7. The CSE designation and the coordination of course should in all cases be designed to strengthen the two departments' separate missions: teaching science, and teaching engineering. For the sake of enrollment and the image of the university, science students should not be forced, nor should they even have the perception that they are being forced, to study engineering solely for reasons of economy, and vice versa.

If you have any problems with this, or if you otherwise feel we need to discuss this framework any further, please let me know.

AZ



NOV 24 1997

November 17, 1997

1798 NW 10th St.
Boca Raton, FL 33431

M. Lewis Temares, Ph.D
Dean
University of Miami
College of Engineering
P.O. Box 248294
Coral Gables, FL 33124-0620

Dear Dean:

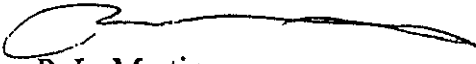
Thank you for the opportunity to review the Bachelors of Science in Information Technology proposal. I cannot emphasize enough its importance to industry, the competitiveness of the students and the continued success of the School of Engineering.

In industry the demand for information technology is unfulfilled and increasing at an incredible pace. Industry often compromises its sourcing of talent with candidates lacking the rigorous fundamentals that academia offers, this is typically due to the lack of available talent. The Information Technology program offers an outstanding platform targeted at today's real needs.

It is no accident that the proposal has such high merit. You have continuously sought the advice of us in industry and have set a course responsive to your customers needs. The program provides good coverage of the fundamental building blocks of Information Technology. It also provides the much needed hands-on experience through laboratory work. I especially appreciated the "Network Computing: The New Enterprise." Network Computing is the new enterprise. It is an unbelievable transformation every company is going through often lacking direction and expertise.

Because this is such a dynamic area, changing faster than courses can be developed, I would encourage supplementing the curriculum with periodic lectures from industry focusing on: technology developments, new applications, the changing business dynamics and the role of the engineer in the new culture. You should also consider good merchandising of this program early-on. This would put the spotlight on U.M. as a potential source of: talent, good co-op assignments and increased grants and research candidate.

Continued Success,


P. L. Martinez
Director
Worldwide Consulting
IBM Corporation

NOV 24 1997
M. LEWIS TEMARES



IBM Latin America
Route 9, Rockwood Road
Sleepy Hollow, NY 10591

Office of Raul Cosio
Vice President, Marketing
(914) 332-3080
Fax: (914) 332-3416

Monday, November 03, 1997

M. Lewis Temares, Ph.D.
Dean
University of Miami
College of Engineering
P.O. Box 248294
Coral Gables, FL 33124

NOV 10 1997

Dear Lew,

Working for the IBM Corporation for 22 years, the impact of information technology on our customers, suppliers and employees has never been more profound. Information technology is being integrated into the fabric of most any operation from simple ATM transactions at a bank to more complex business processes such as supply chain management.

I've reviewed the proposed program for a Bachelor of Science in Information Technology at the College of Engineering and fully endorse its implementation. The demand for I/T skills continues to grow as the globe is becoming more connected and interdependent. Graduating students with knowledge and experience in I/T will certainly be more valuable and require less of a learning curve when they leave the campus.

Congratulations for continuing to push for higher standards of excellence and academic achievement at the College of Engineering.

With best regards,

Raul Cosio
Vice President, Marketing
Latin America

RC/jmn

cc: Tad Foote
University of Miami
President

CAPSULE: Faculty Senate Legislation #97009(B) – Establishment of the Bachelor of Science in Information Technology Degree

RESPONSE BY THE PRESIDENT: Approve DATE: 7/1/98

OFFICE OR INDIVIDUAL TO IMPLEMENT: Provost

APPROVED: Yes SJD

EFFECTIVE DATE OF LEGISLATION: _____

NOT APPROVED AND REFERRED TO: _____

REMARKS (IF NOT APPROVED): _____

Faculty Senate

From: Green, Steven M.
Sent: Thursday, May 13, 1999 6:17 AM
To: Faculty Senate
Subject: confidential for cs/ce file

>Date: Wed, 12 May 1999 15:13:59 -0400
>From: Dean Subbaswamy <swamy@mail.as.miami.edu>
>Subject: RE: Departmental fission
>To: "Green, Steven M." <steven.green@miami.edu>
>X-Mailer: Internet Mail Service (5.5.2448.0)
>Delivered-to: steven.green@miami.edu
>Original-recipient: rfc822;sgreen@umiami.ir.miami.edu

>
>Thanks. I will let you know if this becomes a reality for any current
>department in the College!

>Swamy
>Kumble R. Subbaswamy
>Dean, College of Arts & Sciences
>University of Miami
>Coral Gables, FL 33124-4620
>(305) 284-4021

>
>
>-----Original Message-----
>From: Green, Steven M.
>Sent: Wednesday, May 12, 1999 11:44 AM
>To: Subbaswamy, Kumble R
>Subject: Departmental fission

>
> I have investigated the matter and, confirming our conversation, the
> handling of a departmental fission would be as follows:

>
> If there are two different majors now being offered by one
>department, then
> a new department can be established within the College by whatever
>means is
> consistent with the College's bylaws with one of those two majors
>(and any
> minor or program, as appropriate) being its purview.

>
> The name of that new department is then subject to approval by the
>Faculty
> Senate.

>
> If the removal of the major (as well as the minor and other
>programs, if
> any) from the original host department warrants a change of its
>name, that
> also is a matter for the College's action under its bylaws and is
>also then
> subject to approval by the Faculty Senate.

>
> Good luck!!

>
> -Steve

>
> +=====+
>
> Email response preferred. For fastest delivery, use:
> sgreen@umiami.ir.miami.edu

>
> USPS:

>
> Steven Green
> Dept. Biology, Univ. Miami
> P.O. Box 249118
> Coral Gables, FL 33124

Faculty Senate

From: Green, Steven M.
Sent: Wednesday, May 12, 1999 11:45 AM
To: Faculty Senate
Subject: Departmental fission (For CE/CS file -
CONFIDENTIAL)

>Date: Wed, 12 May 1999 11:44:18 -0400

>To: Swamy

>From: "Steven Green; Dept. Biology (305) 284-4272"

<sgreen@umiami.ir.miami.edu>

>Subject: Departmental fission

>

>I have investigated the matter and, confirming our conversation, the handling of a departmental fission would be as follows:

>

>If there are two different majors now being offered by one department, then a new department can be established within the College by whatever

means is consistent with the College's bylaws with one of those two majors

(and any minor or program, as appropriate) being its purview.

>

>The name of that new department is then subject to approval by the Faculty Senate.

>

>If the removal of the major (as well as the minor and other programs, if any) from the original host department warrants a change of its name, that

also is a matter for the College's action under its bylaws and is also then subject to approval by the Faculty Senate.

>

>Good luck!!

>

>-Steve

+=====+

Email response preferred. For fastest delivery, use:
sgreen@umiami.ir.miami.edu

USPS:

Steven Green
Dept. Biology, Univ. Miami
P.O. Box 249118
Coral Gables, FL 33124

Voice: (305) 284-4272 [direct line; no voice mail]

or (305) 284-3721 [Faculty Senate office -
secretary or answering machine]

FAX: (305) 284-3039

Position: Professor of Biology
and (1998-9;1999-2000) Chairman of the Faculty Senate

Eligibility Criteria for Senate Officers

The Chair reminded the Senate about the legislation introduced by an ad hoc committee charged with recommending modifications to Section B3.6. There were five issues being considered, but the Senate asked that the discussion be deferred to a later time. Today's discussion centered around whether the Chair and Vice Chairs must be members of the Senate at the time of the election versus whether they can be elected from outside the Senate. Professor Yacoub clarified the possibilities. They include: 1) only members of the Senate could be elected officers of the Senate; 2) any faculty member could be elected an officer of the Senate; and 3) other members of the faculty may be elected in special cases, with additional restrictions. After discussion, the Chair called for a straw vote on whether the election of the Senate Chair should be restricted under all circumstances to someone who is a Senator. The vote *failed*. Professor Green presented two possibilities: 1) remain mute on the issue, thereby leaving the interpretation unresolved and the precedent of a Senate chair being elected from outside the Senate open to future Senate decision; or 2) recommend that the committee prepare legislation specifying some kind of eligibility restrictions, e.g., must have been a Senator within the past five years, etc. The Provost suggested that a small committee be appointed to formulate a proposal. He recommended restricting the election of officers to members of the tenured faculty with some minimum amount of time at the University and with certain types of administrators being ineligible. The Chair called for a straw vote on option 1, namely that the eligibility remain open to all faculty, without restriction. The straw vote *failed*. The Chair then asked the Committee to bring back to the Senate a draft of legislation using today's discussion as a guideline.

Update on CE/CS Issues

Professor Alexandrakis reported that the Department of Electrical and Computer Engineering and the Department of Mathematics and Computer Science unanimously accepted the CE/CS proposal. He expressed his appreciation for the cooperative efforts of those involved. Professor Clasby queried a statement in the agreement concerning the teaching of courses and was assured that the language does not preclude the teaching of these courses by non-tenure track faculty. Professor Coomes thanked the Senate for its role in helping to resolve the issues. The Chair expressed thanks on behalf of the Senate to Professor Alexandrakis for his assistance in resolving the matter.

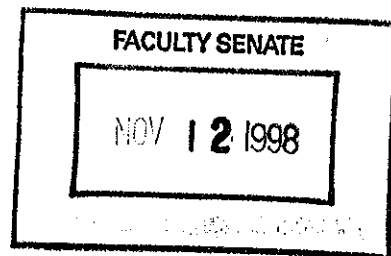
Administration's Recommendation for Changing the University of Miami Tuition Remission Benefit for Dependents

Three background items were presented by the Chair: 1) the Employee Benefits Committee recommended tuition co-payments, by new employees only, for dependents pursuing degrees at the University of Miami; 2) the Administration's view aired by Mr. Lieberman has been to have co-payment changes affect current, as well as new employees; and 3) a petition from 1500 current employees protesting the proposed change has been received. The administration has now withdrawn its proposal to have any change in policy affect anyone other than those hired in the future. Mr. Lieberman has requested advice and feedback. Since the current benefit is part of the *Faculty Manual*, the benefit to faculty cannot be changed without faculty approval or the Board of Trustees would resolve any difference between the faculty and the administration.



MEMORANDUM

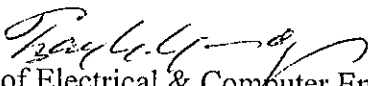
November 12, 1998



To: Dr. George Alexandrakis
Chair, Department of Physics

Dr. Steven Green
Chair, Faculty Senate

Copies to: Dr. M. Lewis Temares
Dean, College of Engineering
Dr. Kumble Subbaswamy
Dean, College of Arts & Sciences
Dr. Alan Zame
Chair, Department of Mathematics & Computer Science

From: Tzay Y. Young 
Chair, Department of Electrical & Computer Engineering

Subject: Proposed CS/CE Coordination Agreement

The proposed Computer Science/Computer Engineering Coordination Agreement with modifications suggested by Dr. Alexandrakis, Faculty Senate Representative, was presented at the Faculty Meeting of the Department of Electrical & Computer Engineering on November 6, 1998. The ECE faculty unanimously approved the modified agreement (see Attachment).

Thank you for your effort to help resolve the differences between the two departments.

Attachment

Department of Electrical and Computer Engineering
P.O. Box 248294
Coral Gables, Florida 33124-0640
Phone: 305-284-3291
Fax: 305-284-4044
E-mail: ece@eng.miami.edu

Computer Science-Computer Engineering Proposal Agreement
(including modifications suggested by the Faculty Senate Representative)

1. The courses offered in computer science and computer engineering will be coordinated by the Computer Science - Computer Engineering Coordinating Committee nominated by the Departments and appointed jointly by the deans of the College of Engineering and the College of Arts and Sciences. The chairmanship of the committee will rotate annually between the two departments. The Chairs of the two departments will be ex-officio members of the Committee. Matters that cannot be resolved within this committee, when necessary will be referred to the two deans and the Provost for resolution.

2. There should be no unnecessary duplication of courses at any level. In any given academic year, two sections of courses that have substantial overlap in content cannot be offered unless it is justifiable by enrollment history.

3. The Appendix gives the details of the agreement pertaining to courses in the two programs. A home department has been assigned for all courses as shown in the Appendix. A common designation, CPT will be cross-listed with the respective home department courses.

4. There are six 500-level courses that will be designated as shared courses, listed as such in the Appendix. The two departments shall alternate as the teaching department in the offering of these courses. The frequency in the offering of these courses will be subject to enrollment guidelines as indicated above.

5. The faculty teaching in computer engineering and computer science courses should be assigned to these so as to maximize the benefits to students and to best use the available expertise, regardless of the home department of the faculty member.

6. To the maximum extent possible, most courses should be taught by regular tenure-track faculty. In no case should the quality of the teaching be compromised by this understanding. The hiring of full-time faculty who will teach courses in either program should be done in consultation with the coordinating committee, and is subject to normal University approval process.

7. Tenure-track computer faculty in either program should be hired with a view toward achieving a healthy balance between the teaching and research needs of the entire computing area, encompassing both departments. While ensuring that all courses at all levels can be adequately covered, the areas of research expertise of new hires might overlap where research funding opportunities may be enhanced by doing so. The two deans will coordinate the hiring in their colleges to achieve a strong, competitive academic and research program at the University of Miami.

MEMORANDUM

TO Faculty Senate

11/16/98

FROM Alan Zame
Chair, Math & CS



We accept the CS/CE agreement as modified by Professor Alexandrakis and approved by the faculty of the Department of Electrical and Computer Engineering.

Update on CE/CS Issue

Professor Green explained that the CE/CS issue arose from having resources of two departments in two different schools join in a program for a degree that can be advertised as individual degrees but cooperating in their curriculum and teaching of courses. College of Engineering Dean Temares reported that an agreement has been reached with the deans and the Provost. However, the Department of Electrical and Computer Engineering faculty is waiting to meet with their chair. Dean Subbaswamy of the College of Arts and Sciences reported that the Department of Mathematics and Computer Science chair and faculty have asked him to sign the agreement as well.


Administration's Proposal for Changes in UM Tuition Remission Benefits for Dependents.

The Chair announced that the origin of the proposal was from OMB. Their position is that universities compete unfairly with non-university bidders on government contracts because they cannot offer this kind of benefit. Professor Yacoub said that the proposal for modifying the tuition remission benefit for dependents would not affect present employees. He explained the rationale for the Employee Benefits Committee's proposal for dependents of new hires and stated that the new formula would not include tuition remission beyond 90%. The new formula would be 75% the first five years, 85% the next five years and 90% thereafter. Professor Yacoub explained that his presentation would serve as the required 90-day notice. According to Professor Yacoub, there is revenue associated with \$10M of tuition. The revenue loss is approximately \$1.9M, but there is \$150,000 to offset the loss. Following discussion regarding the generous fringe benefits offered by the University, it was suggested that Mr. David Lieberman should be invited to the next Senate meeting.

Extension of Benefits to Domestic Partners

Professor Awad presented the School of Medicine's proposal, endorsed unanimously by the School of Council, that any form of domestic arrangement would receive any employee benefit, regardless of gender arrangement. President Foote presented the historical view of the issue and reiterated the Board of Trustees' refusal to change the present policy. Following discussion, it was *moved* and seconded to establish a committee to examine the issue of extending benefits to domestic partners and bring a recommendation to the Senate. The *motion carried*.

The meeting adjourned at 6:05 p.m.


Barbara L. Hoadley
Secretary of the Faculty Senate

SYNOPSIS OF ACTIONS

Taken by the
Executive Committee
University of Miami Board of Trustees
November 17, 1998

AUTHORIZED administration to spend an additional \$300,000 for the completion of the 50% construction documents for the Batchelor Children's Center.

APPROVED amendments to the Faculty Charter regarding: Revisions to Undergraduate Honor Code; Rescission of Section B8 of the Bylaws, pertaining to Graduate School of International Studies; Establishment of the School of International Studies; Establishment of a Department of Geography in the School of International Studies; Transfer of the International Studies Program from the College of Arts and Sciences to the School of International Studies; Restructuring the Honors Program; Establishment of the Bachelor of Science in Information Technology Degree; Approval of the Center for Research on Sport in Society; Change in name for the Department of Geography, and Change in name and status of the "Advanced Diploma in Performance".

AUTHORIZED administration to enter into a contract with UNUM for long term care starting in 1999, with the understanding that full premium cost will be covered by faculty and staff.

APPROVED the establishment of the quasi-endowment fund for the School of Continuing Studies.

AFFIRMED and reaffirmed the sense of the Executive Committee that it supports President Foote's recommendation to grandfather current employees to retain tuition remission and that the administration should respect Faculty Senate's processes in regards to tuition remission.

Report of Ad Hoc Committee on Tenure Review Board Recommendations

Professor Joanna Lombard, Chair of the Ad Hoc Committee on Tenure Review Board Recommendations, thanked Drs. Wilson and Ullmann for their help in clarifying several situations. She continued by reviewing the Committee's final report. The standards and criteria for tenure used by each school and college should be on file with the Faculty Senate. Those entities without such materials are encouraged to review and document current practice and to file the information with the Senate Office. This concludes the function of the ad hoc committee.

Progress Report on CE/CS Courses

The Chair reminded the Senate that this item is a continuation of the Senate's consideration of the new degree program in Information Technology. He asked Deans Subbaswamy and Temares to present an update on the unresolved issues as requested by the Senate. Dean Temares stated that the committee continues to meet to discuss courses and where they will be housed. The Chair requested another update in the fall indicating whether the remaining issues have been resolved. Professor Yacoub reiterated the view that the Provost needs to be assured that the two departments are optimizing the use of their resources. Therefore, the chairs should see to it that cross-listed courses should not be taught by both departments in the same semester and, that where there is need to offer only one section of the cross-listed courses per year, the two department chairs shall agree on a yearly rotation of such course listings. The deans should guarantee that the respective chairs will coordinate these offerings accordingly and thus there will be no need for either faculty to give up any of their current course listings.

Calendar Committee Report (Second Reading)

Dr. Wilson reminded the Senate that previous discussions indicated an interest in only the two-day fall break. Senators were asked to discuss the issue with their schools to determine whether there were any problems with the proposed calendar. Professor June Dreyer stated that the School of Business School Council unanimously voted against the proposal of a two-day break. In fact, they oppose the new one-day break and would prefer the status quo. The Provost stated that the one-day break legislation had been discussed by the Academic Deans Administrative Council, the Academic Standards Committee, and students presented their views to the Senate before it was voted upon. Professor Yacoub explained the rationale for the calendar he prepared. He suggested that it be given to the Provost as a working document to assist him in preparing a calendar for 1999-2000. Provost Glaser said he would discuss it with the deans at his first meeting in the fall. The proposal will then be brought back to the Senate before it is finalized. There was a brief discussion about the validity of scheduling reading days in the calendar.



Please Hand Deliver This Facsimile To:

Professor Steven Green, Chair # 5515
Faculty Senate

Message To Recipient

For your information.
Minor changes only were needed.
The draft was agreed to by
the chairs.
We will wait and see.

George

Date _____

Time _____

This Message Is From _____

Pages (including cover) _____

James L. Knight Physics Building
1320 Campo Sano Drive
Coral Gables, FL 33146

Phone: (305)-284-2323

Post Office Box 248046, FL 33124

FAX: (305)-284-4222

Computer Science-Computer Engineering Proposal Agreement
(including modifications suggested by the Faculty Senate Representative)

1. The courses offered in computer science and computer engineering will be coordinated by the Computer Science - Computer Engineering Coordinating Committee nominated by the Departments and appointed jointly by the deans of the College of Engineering and the College of Arts and Sciences. The chairmanship of the committee will rotate annually between the two departments. The Chairs of the two departments will be ex-officio members of the Committee. Matters that cannot be resolved within this committee, when necessary will be referred to the two deans and the Provost for resolution.

2. There should be no unnecessary duplication of courses at any level. In any given academic year, two sections of courses that have substantial overlap in content cannot be offered unless it is justifiable by enrollment history.

3. The Appendix gives the details of the agreement pertaining to courses in the two programs. A home department has been assigned for all courses as shown in the Appendix. A common designation, CPT will be cross-listed with the respective home department courses.

4. There are six 500-level courses that will be designated as shared courses, listed as such in the Appendix. The two departments shall alternate as the teaching department in the offering of these courses. The frequency in the offering of these courses will be subject to enrollment guidelines as indicated above.

5. The faculty teaching in computer engineering and computer science courses should be assigned to these so as to maximize the benefits to students and to best use the available expertise, regardless of the home department of the faculty member.

6. To the maximum extent possible, most courses should be taught by regular tenure-track faculty. In no case should the quality of the teaching be compromised by this understanding. The hiring of full-time faculty who will teach courses in either program should be done in consultation with the coordinating committee, and is subject to normal University approval process.

7. Tenure-track computer faculty in either program should be hired with a view toward achieving a healthy balance between the teaching and research needs of the entire computing area, encompassing both departments. While ensuring that all courses at all

levels can be adequately covered, the areas of research expertise of new hires might overlap where research funding opportunities may be enhanced by doing so. The two deans will coordinate the hiring in their colleges to achieve a strong, competitive academic and research program at the University of Miami.

A handwritten signature in cursive script, appearing to read "Gene S. ...". The signature is written in black ink and includes a long, sweeping underline that extends to the right.

Faculty Senate

From: Green, Steven M.
Sent: Tuesday, September 15, 1998 7:25 AM
To: Alan Zame
Cc: Faculty Senate
Subject: Re:

At 19:34 9/14/98 -0500, you wrote:

>What does this mean then? If what you say is correct, the provost is
>misinformed about what has happened (and is misinterpreting the document
>anyway). What are we supposed to do now if EE rejects the agreement? What
>are we supposed to do if EE accepts the agreement and the provost persists
>in his misintepretation?
>
>AZ

I don't know what is likely to occur at this point. An College Council meeting in Engineering may address the issue. Among other issues, they are objecting (quite correctly I think you will agree) to having budgets/lines being held hostage to an agreement to coordinate curricula. I think that the Dean of Engineering misunderstood or misspoke where the matter stands in the Department.

-Steve

```
+=====+  
# Steven Green      #  
# Dept. Biology, Univ. Miami #  
# P.O. Box 249118   #  
# Coral Gables, FL 33124 #  
# SGREEN@UMIAMI.IR.MIAMI.EDU #  
# (305) 284-4272    #  
# FAX: (305) 284-3039 #  
+=====+
```

Faculty Senate

From: Green, Steven M.
Sent: Wednesday, September 16, 1998 11:21 AM
To: Faculty Senate
Subject: For files re CE-CS

>Date: Wed, 16 Sep 1998 09:25:00 -0400 (edt)
>From: "YACOUB, DR. KAMAL" <KYACOUB@engine01.msmail.miami.edu>
>Subject: THE CASE AGAINST THE PROPOSED CE-CS AGREEMENT
>To: "Glaser, Luis" <lglaser@miami.edu>, "Temaes, M. Lewis"
<mtemares@miami.edu>
>Cc: "Foote, Edward T." <efoote@miami.edu>,
> "Yacoub, Kamal" <kyacoub@eng.miami.edu>,
> "Green, Steven" <steven.green@miami.edu>,
> "Subbaswamy, Kumble R" <swamy@miami.edu>,
> "Young, Tzay Y." <tyoung@eng.miami.edu>
>X-Mailer: Microsoft Mail V3.0
>Encoding: 113 TEXT
>Delivered-to: steven.green@miami.edu

>
>
>I prepared the following statement for presentation to the appropriate
>Faculty Senate Group after the Faculty Senate Chair decide how to proceed
>with the complaint lodged in my memo of 9-8-98.
>Collegiality suggest that I inform you of this statement in advance of such
>proceedings.
>respectfully submitted, K. Yacoub

>-----
> The case against the PROPOSED agreement for CE-CS

>Coordination

>
>
>Our School of Engineering was born in 1947 as a response to the GI bill. We
>have received professional accreditation continuously since 1964.

>
>Computer Engineering was initiated in 1972 as an option under our Electrical
>Engineering program. Later, it was upgraded to a stand alone program and has
>received separate accreditation since 1988.

>
>In 1981, we became the first State-wide Engineering Program to receive the
>State of Florida Tuition Subsidy Contract. It was also the first such
>University of Miami Contract outside Medicine and Nursing. This conquest
>followed and was a direct result of an out of state Advisory Group visit to
>all public and private computer programs in Florida, as advisory to the
>Florida Legislature.

>
>Since we received the State Contract in 1981, we have graduated over a
>thousand computer engineers who are spread all over the South Florida
>high-tech industry and the nation in general.

>
>In short, we are proud of our Department, our Programs and our
>accomplishments. We deserve better treatment from our Provost and better
>defense from our academic Dean.

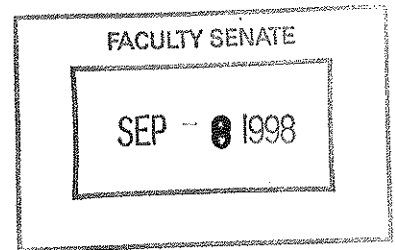
>
>If you read the proposed agreement either the one prepared by the Deans or
>the one slightly amended by the Provost, I hope you will agree that it
>sounds like a contract governing the behavior of an indigent or someone on
>probation. well, we are neither and we ask you to save us from this proposed
>humiliation that is being forced upon us under the continued threat of the
>Provost's budget freeze of open faculty lines. A freeze which he has imposed
>for the past two years.

>
>WHAT IS WRONG WITH THE PROPOSED AGREEMENTS and COULD IT BE FIXED WITHOUT
>WEAKENING THE NECESSARY COORDINATION? (YES, WE HAVE STRONG RESERVATIONS AND
>APPROPRIATE AMENDMENTS TO PARAGRAPHS 1 & 6).

>
>AS TO PARAGRAPH #1
>
>Since certain authority currently lodged in the two departments will have to
>be delegated to the Coordinating Committee, therefore, the membership of
>this committee should be elected respectively by the two departments that
>are delegating this authority rather than appointed by the two Deans.
>
>The actual authority delegated to the coordinating committee is at least
>defined in the Deans proposal as modified by the ECE Faculty. These
>modifications were rejected by the Deans and ignored by the Provost without
>any explanation. On the other hand, both the Deans Proposal and that of the
>Provost does not define what authority will be delegated and leaves the very
>likely interpretation that complete authority on all computer courses are
>herewith delegated.
>
>While the size of the coordinating committee is not specified in either
>proposal, our Dean made it clear that it is the intention of both Deans to
>appoint only two faculty members from each Department, and not to include
>the chairs as the current committee is currently composed. In addition, both
>proposals state that disagreements within this committee will be directly
>referred to the Deans and the Provost, in essence, bypassing both
>Departments and both Chairs.
>
>DOES THE INAPPROPRIATENESS OF THE ABOVE REQUIRE ANY EXPLANATION? I THINK
>NOT.
>
>AS TO PARAGRAPH #6
>
>Consider the following two sentences: "To the maximum extent possible, all
>courses should be taught by regular tenure-track faculty. Any deviation from
>this should be remedied as soon as possible."
>
>Which department at U.M. does not aspire to be able to do that? I believe
>every department at U.M. wishes to do that, if it can afford it. On the
>other hand, how many departments at U.M. has reached these aspiration? I
>believe very few if any.
>
>We believe that the above aspiration, which should be the aspiration of all
>departments and Schools if and when budgets allow, should either be taken
>for granted or if necessary published in the Faculty Manual. However, it
>does not belong in any one coordination agreement. To do otherwise would
>imply one of two undesirable meanings described below:
>
> - Either that one or both departments are under special Probation.
>
> -or that this aspiration is not the norm for our University, but rather the
>aspiration of only those two Super Departments with Super Resources.
>
>WELL, WE ARE NEITHER UNDER PROBATION NOR A SUPER DEPARTMENT WITH SUPER
>RESOURCES. We are simply a hard working and proud Department well lead that
>pulls itself with its own boots. We have been choked for the past two years
>by a freeze on our open lines, until we say uncle. In addition, we have been
>choked a third year earlier when we were forced to give a leave of absence
>to one of our Faculty members without positive recommendation of our
>Department. Our department was convinced that the Faculty member is not
>planning to come back but is rather using us as a spare tire, a position we
>could ill afford. Add to these three years two more years of cuts in our
>Faculty lines due to the re-engineering of the College of Engineering. I
>hope you agree now that the above condition does not belong to our singular
>agreement.
>
>I assure you that if this Proposed agreement was reviewed and amended not
>necessarily by our Department, but by an appropriate committee of peers
>appointed by the Faculty Senate and to the satisfaction of the Faculty
>Senate, then the ECE Department will accept the amended proposal
>Unanimously.

+=====+
Steven Green #
Dept. Biology, Univ. Miami

P.O. Box 249118 #
Coral Gables, FL 33124 #
SGREEN@UMIAMI.IR.MIAMI.EDU #
(305) 284-4272 #
FAX: (305) 284-3039 #
+=====+



To: Faculty Senate Chair
From: K. Yacoub; Senator, College of Engineering
Date: September 08, 1998
Subject: Authority of the Provost

Copies to: President Edward T. Foote III
Provost Luis Glaser
Dean M. Lewis Temares; College of Engineering
Dean Kumble Subbaswamy; College of Arts and Sciences
Electrical and Computer Engineering Faculty
College of Engineering Council

The need for coordination of course content and course scheduling between Computer Engineering and Computer Science is an issue on which all Faculty agree. In achieving such coordination, it is not uncommon that issues of turf protection would appear and divide the two concerned Faculties and possibly the Faculty Senate. Yet, the current proposals on the above issue from the two Deans and from the Provost include many dangerous precedents concerning Faculty Rights and Faculty Authority over its curriculum, and yet these issues are being obscured by the minor issue of turf protection.

Currently, I find my department under pressure from both Deans, the Provost and the Faculty Senate to accept those proposed agreements without regard to their content and the danger they bring to the rights of all faculties in all Departments and Schools with regard to their authority over their curricula. Therefore in order to bring this bigger danger to light, I am herewith recommending strongly to all my colleagues in the Department of Electrical and Computer Engineering to accept that part of the proposed agreement that relates to turf without any reservations. This means that all six courses will be shared and coordinated as to their content and scheduling by a coordinating committee. I also ask my colleagues that with the turf protection issue behind us, let us turn our attention and the attention of the Faculty Senate and all concerned Faculty to the issues of Departmental Faculty rights and whether these rights could be threatened or coerced by budgetary means.

Therefore I wish to raise the following question to my Senate colleagues. Does the Senate believe that the authority of the Provost on budgetary matters is absolute such as that of a king or a sovereign, or whether such budget authority is bound by the best interest of the institution and as such, it is the responsibility of the Provost to explain to the satisfaction of the Faculty Senate how any unusual exercise of such authority is in the best interest of this University.

Department of Electrical and Computer Engineering
P.O. Box 248294
Coral Gables, Florida 33124-0640
Phone: 305-284-3291
Fax: 305-284-4044
E-mail: ece@eng.miami.edu

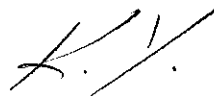
In particular, does the provost have the right to use his authority over our budget to force us to accept a reduction of our academic authority on our programs beyond that which we are willing to agree to as above, an academic authority that we derived from the academic authority of the Faculty of the College of Engineering and which in turn was derived from the authority of the Faculty Senate rather than that of the Administration. An authority that we believe we have used well to build our programs and get them both accredited by ABET as well as becoming the first University of Miami Engineering Program to receive the State of Florida Tuition Contract and the first such U.M. Program outside the health profession (Medicine and Nursing).

We feel that the intrusion of the two Deans with the help of the Provost into our academic authority will weaken our programs at a time when the number of our computer engineering student majors have been increasing at the rate of 20% per year over the last three years and the national trend is for continuing growth in this major. However, rather than investing in this program to attract the best candidates in students and faculty, the administration is wasting valuable time by freezing the open faculty positions for the last two years in order to force us to accept a new structure that in essence will create a new quasi department without Senate approval but by an administrative edict.

We ask that the Senate clarify our departmental faculty rights and authority over our curriculum, and help us establish whatever new structure that is appropriate by cooperation between the faculty and the administration rather than confrontation and shotgun marriages.

As soon as you decide how to proceed with this complaint (Advisory Council or General Welfare Committee or full Senate), I will supply you with the appropriate number of copies of the Deans' proposal, our proposed modifications to that, and finally the proposal from the Provost.

Respectfully Submitted



K. Yacoub; Senator,
College of Engineering

Faculty Senate

From: Green, Steven M.
Sent: Monday, September 14, 1998 7:04 PM
To: alan zame
Cc: Faculty Senate
Subject: Re:

At 15:32 9/14/98 -0500, you wrote:

> I just received a copy of a memo from Glaser to Temares and Swamy,
> dated September 4 and received by A&S on September 9. The subject is "Good
> News- CE and CS Have Agreed!" Has CE agreed? My impression last week was
> that they had still not had a meeting to sign off on the proposal. In
> addition, Glaser says "everything is now in place for the joint program to
> get started." What joint program is he referring to? Finally, he says "As
> per our agreement.....we proceed as soon as possible to identify the areas
> in which we would like to recruit two faculty members....by the fall of
> 1999." There is nothing in the agreement that says we should hire (only)
> two faculty members this year, although in the provost's preamble to the
> agreement he does say that he thinks that is what we should do.
> Do you have any reaction to this?
>
> Thanks.
>
> AZ

My understandin is that they have not agreed and I hear that they are unlikely to agree with the document under consideration.

-Steve

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+=====+  
# Steven Green      #  
# Dept. Biology, Univ. Miami #  
# P.O. Box 249118   #  
# Coral Gables, FL 33124 #  
# SGREEN@UMIAMI.IR.MIAMI.EDU #  
# (305) 284-4272    #  
# FAX: (305) 284-3039 #  
+=====+
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Bachelor of Science in Information Technology (First Reading)

Professor John Stewart, Chair of the Ad Hoc Review Committee, reported on the committee's investigation of the proposal for the Bachelor of Science in Information degree, and its subsequent approval. He mentioned that the proposal combines electrical engineering with basic computer courses, with a strong emphasis on the computer end. Deans Subbaswamy and Temares have discussed the details of the program. The Committee recommended approval of the program. It was suggested that before the second reading, a resolution of the remaining issues between Computer Engineering and Computer Science should be in place. If an impasse exists, a written document should be prepared for discussion with both deans at the Senate meeting. The second reading will be scheduled when the committee is ready. Professor Oxman asked for reaction to the proposal from the relevant faculty, not just the chairs.

It was suggested that when proposals are brought forward for Senate discussion in the future, the relevant faculty should be notified.

Report from the Distinguished Faculty Scholar Committee

Professors Frank Millero, former Distinguished Faculty Scholar, presented the Committee's report and recommendation that Professor J. Maxwell McKenzie, Chairman Emeritus of the Department of Medicine, be awarded the 1998 award. The Senate unanimously approved the recommendation.

Proposed Center for Research on Sports in Society

The Chair indicated that a request would be forthcoming from the College of Arts and Sciences for Senate approval of the name for a proposed Center for Research on Sports in Society. Professor Wilson explained that the *Faculty Manual* defines an Independent Center and an Institute or Sponsored Center. It appears that the proposed Center falls into the second category, Section B6.6, of the *Faculty Manual*. One Arts and Sciences Senator stated that most of the faculty of the College does not know of the existence of such a program and that the information should be circulated. Professor McKenry noted that the School of Education has a similarly named program and that any possible conflict should be considered. It was pointed out that the faculty of the College of Arts and Sciences need to approve the new Center, and that information about the Center should not have been distributed prior to the approvals of the faculty, Senate, and President.

The President then asked Mr. David Lieberman, Senior Vice President, to address the issue of outsourcing the bookstore and the possibility of its relocation. According to Mr. Lieberman, the University has asked for bids from five companies, which will then need to be evaluated by the administration and the Senate's Administrative Services Committee. In response to a query about how present employees will be affected, Mr. Lieberman stated that the University will require responsible actions of a winning bidder by guaranteeing employment for a limited time and then providing a rationale for any changes they would want to make. Professor Berman asked whether the funds generated by outsourcing will be given directly to the Coral Gables campus or will the Medical School bookstore still maintain control over the monies they receive. Mr. Lieberman's responded that all Medical School bookstore surpluses would continue to be the property of the Medical School and will fund scholarships, as has been the case for several years. He also said there would be no cost increase for books for students with outsourcing the bookstore. Professor Clasby inquired whether consideration had been given to the bookstore employees' retirement benefits.

Mr. Lieberman went on to say that an article in the *Chronicle* indicated that for the year ending June 30, endowments were up 21.9%, not only from investment return but also from gifts and other sources. The University's investment return in the growth pool was 19.5%.

Approval of the Minutes

The minutes of the January 26 meeting were approved as submitted. Excused absences were approved for Professors Chandar, Curtis, Dreyer, Fishman, Mash, Peterson, Warren and Yacoub.

Proposal for the Bachelor of Science in Information Technology (Second Reading)

Professor John Stewart, Chair of the ad hoc committee to review the proposal for the Bachelor of Science in Information Technology, presented an update for the second reading of the proposal. He reminded the Senate that two issues were of concern at the last Senate meeting: 1) the scope of the demand for information technology professionals; and 2) what plan is in place for the elimination of duplication of courses between the Department of Mathematics and Computer Science and the Department of Electrical and Computer Engineering. Professor Stewart cited several sources that explained job opportunities in the information technology field. In an effort to work out an agreement between the departments, Professor Stewart noted there is now a scheduled committee meeting each week. The committee consists of the two deans, the two chairs, and two faculty members from each department. There has been substantial progress in resolving the remaining issues, according to Professor Stewart. Dean Temares and Dean Subbaswamy spoke about the merits of the program and the reasons for approving it. Discussion followed and members of the Department of Mathematics responded to several questions from the body. Professor Sumanth urged approval of the proposal and informed the Senate that the Executive MBA, Master of Science in Industrial Engineering program was a similarly cooperative venture that has continued for over fifteen years. It was ~~moved and seconded to~~

~~approve the proposal by adding the condition that a report from the Deans shall be forwarded to the Senate as to the resolution of the remaining issues at the earliest possible time.~~ It is the understanding of the Senate that the resolution of issues may occur in ways other than those outlined in the proposal. Provost Glaser reiterated his commitment to the success of the new program and recommended its approval. The *motion carried*.

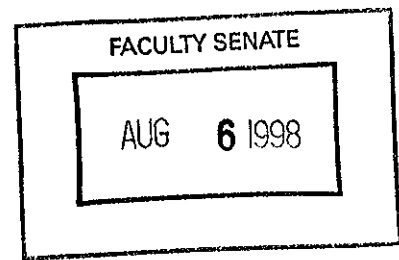
Academic Standards Committee Report on the Drop Date

Professor Tom Steinfatt, a member of the Academic Standards Committee, presented the Committee's report and recommendation with regard to moving the drop date from the sixth to the tenth week of the semester. They felt that the best way to serve students would be to give the students two exams before the drop date. Following discussion, it was *moved* and seconded to approve the recommendation. The *motion failed*.

Away Tuition Proposals

The report on proposals for away-tuition, prepared by Professors Clasby, Dreyer, and Hill, was discussed. Three options were identified in the proposal as possible scenarios for the program. It was suggested that the members of the UMMG plan should not vote on the proposal. Professor Oxman distributed a summary of points in opposition to a mandatory away-tuition proposal. He then proposed that a vote be taken on the option of individual choice. Professor Green informed the Senate that it was decided some time ago that the UMMG funding would be kept entirely independent from a single pool of funds that would apply to all other participants in a separate plan. Professor Munter suggested that one alternative to the proposal would be for the University to participate in a consortium program which would function as an extended tuition-remission program. Several comments were made in opposition to a mandatory program. It was *moved* and seconded to approve Option 2, Section (1)(a)(b)(c)(ii)(a). The vote was by secret ballot. The Chair thanked the Committee for its work and for the participation of the Senate. The *motion to approve Option 2 failed*, by a vote of 14 in favor with 20 opposed. In response to a question about whether the status quo would preclude an individual school from presenting a plan for its own people, the President said he did not think it would preclude any school from bringing forward any proposal. Any proposal would be considered on its merits. It was *moved* and seconded to retain the status quo. The *motion carried*.

Monies sequestered by the Provost for the establishment of an away-tuition program would now be available for benefit enhancement, according to Professor Green. He presented three possible benefits that will be considered by the Employee Benefits Committee and requested instruction by the Senate as to the priority of each. The enhancements would apply to the following areas: 1) long-term disability; 2) participation and funding for a long-term care program; and 3) an enhanced UM contribution to the dental plan. It was *moved* and seconded to instruct the Senate Chair to negotiate with the Provost and the President that the \$250,000 is returned to the salary pool as quickly as possible. The *motion carried*. The one-time amount should also be put into



MEMORANDUM

August 6, 1998

To: Dr. M. Lewis Temales, Dean, CoE
Dr. Alan Zame, Chair, MCS Department

From: Tzay Y. Young, Chair, ECE Department *Tzay Y. Young*

Copies to: Dr. Luis Glaser, Provost
Dr. Kumble Subbaswamy, Dean, A&S
Dr. David Wilson, Chair, Faculty Senate
Dr. Steve Green, Chair Elect, Faculty Senate

Subject: CS/CE Course Coordination

Dr. Zame presented in his memorandum of August 1, 1998 his view on the issue of six courses. It contains statements that we consider to be misleading and statements that omit essential facts. I could argue with him point by point, but choose not to do so. I feel that the continuation of this type of argument by memorandum is counter-productive. Dr. Zame did not address the issue of course assignment to non-tenure track full-time faculty.

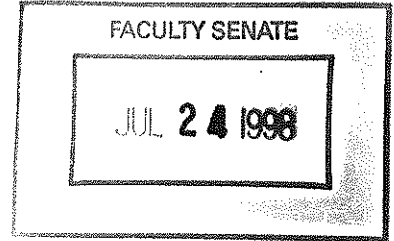
This short memo is simply to make clear without getting into details that we disagree with many of the statements in Dr. Zame's memo. At the same time I believe that since the issue now involves only two courses, EEN 511 and EEN 572, it can be resolved by negotiation.

TY Y/ mp

Department of Electrical and Computer Engineering
P.O. Box 248294
Coral Gables, Florida 33124-0640
Phone: 305-284-3291
Fax: 305-284-4044
E-mail: ece@eng.miami.edu




COLLEGE OF ARTS AND SCIENCES



Office of the Dean

MEMORANDUM

TO: M. Lewis Temares
Dean, College of Engineering

FROM: Kumble R. Subbaswamy 
Dean, College of Arts and Sciences

DATE: July 24, 1998

SUBJECT: Agreement for Coordination of CS and CE Courses

I received the "amended" agreement concerning the coordination of CS and CE courses from Professor Young, and I am deeply distressed. Basically, we are back to square one. The changes pertaining to shared courses lead us immediately to historical controversies of who copied whose course first, which started the two programs down the path to the present chaos in the first place. Needless to say, the Math & CS faculty find these changes completely unacceptable. The changes pertaining to the assignment of faculty to courses represent, to me and my colleagues in Arts & Sciences, a retrenchment from the very essence of a research university that we claim to be. I personally find these changes unacceptable.

As the joint memo from you and me to the two programs indicated, our proposed draft was indeed a compromise. There are items in the original version that neither group likes. The time has come for all relevant faculty to set aside parochial interests and personal egos in order to make the University of Miami a better academic institution. Dr. Zame and the computer science faculty are willing, in spite of all their reservations, to abide by the terms of the original agreement that you and I drafted (and the Provost indicated he would go along with it). There is no point in further negotiations if, after a full year of intense, time-consuming conversations, we go back essentially to issues that divided the two sides in the first place. With deep regret I am canceling the meeting scheduled for July 29th for the two groups of faculty. I will strongly urge the Provost to either enforce a version of an agreement that he thinks is in the best interests of the institution or let Arts & Sciences go ahead with its own plans for rebuilding computer science independently of the plans and designs of Engineering.

Professor Young's cover memo speaks of good will. I think I have shown enormous good will in lobbying for and supporting the passage of the B.S.I.T program in the College of Engineering in spite of my own reservations about the proposal and the strong opposition from Arts & Sciences faculty and senators. I think the amendments that take us back to the same divisive positions are totally counterproductive.

To: M. Lewis Temares
Dean, College of Engineering
July 24, 1998
Page 2

I think those engineering faculty who are invoking faculty autonomy to oppose the proposed agreement are being disingenuous. Given the strong overlap that has developed in the courses of the two academic programs (e.g., required courses for one program being taught in the other department, and vice versa), a certain loss of departmental autonomy is inevitable. If the two groups of faculty can't reach accommodation, what would the Faculty Senate suggest the administrators do? I will be making my case directly with the Senate as well.

pc: Luis Glaser
Executive Vice President and Provost
Steve Green
Chair, Faculty Senate
Alan Zame
Chair, Department of Mathematics and Computer Science
Tzay Young
Chair, Department of Electrical and Computer Engineering



FACULTY SENATE

JUN 10 1998

Executive Vice President and Provost

M E M O R A N D U M

June 30, 1998

TO: Dean Kumble Subbaswamy
College of Arts and Sciences

Dean M. Lewis Temares
College of Engineering

Dr. David Wilson
Chair, Faculty Senate

FROM: Luis Glaser
Executive Vice President and Provost

A handwritten signature in dark ink, appearing to be "Luis Glaser", written over the printed name.

SUBJECT: Computer Science - Computer Engineering

I received a memo from David Wilson addressed to both Dean Swamy and Dean Temares and was confused about the meaning of it, but I understand this somewhat better after Steve Green talked to me. I am afraid that in this case the more we all work together the more we create confusion rather than enlightenment. Let me try to explain what I believe is the relevant issue.

Faculties indeed have a right to determine the intellectual content of their programs, subject to all the approvals that we know about, and obviously the evolution of the field, and always with respect for academic freedom. Not included in this, however, are constraints as to who teaches a course, or how many sections of a course are to be taught or even the time in which the course is to be offered, all of which are considered administrative matters.

In the long and difficult discussions between the Department of Mathematics and Computer Science and the Department of Electrical and Computer Engineering, the purpose of which has been to avoid waste and duplication and provide the very best educational experience to our students, I assume that departments have been kept informed of these discussions in whatever informal way is appropriate. At the end of the day, however, we are not dealing with the ultimate intellectual content of the program (which I think is fundamentally a departmental issue) but with the common use of shared resources, in this case

Subbaswamy, Temares, Wilson, cont. Page 2
June 30, 1998

primarily faculty. I will remind everyone that the *Faculty Manual* clearly specifies that reasonable teaching assignments must be accepted by faculty and that these assignments are therefore subject to administrative decisions.

If we now propose to go back to each of the departments for yet another series of reviews, discussions, etc., I think we are creating a very unhealthy environment. At the present time I have taken the position that until these issues are resolved, and this has been ongoing for over a year, no new appointments will be made in either of these two departments, not only in this area but in any other related areas. In the absence of that, it may become necessary to review totally how we provide instructions to our students in these very important fields. By not moving forward, we not only do not serve our students well but may soon miss a major opportunity for the University.

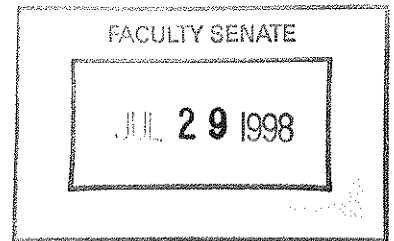
I believe that the deans have more than reasonably exerted their appropriate authority in these matters, and expect that they will continue to do so. I also fully expect all of these matters to be resolved before the academic year starts in the fall. Let me say that the proper channels by which discussions need to be conducted, if any, should involve the deans as well as the chairs, and I hope that this can happen as expeditiously as possible.

It is not clear to me why this has now become a matter of discussion for the Faculty Senate, although it has been discussed in other contexts with the full Senate at several meetings.

If the three of you believe that it would be appropriate for us to sit down and discuss this, I would be glad to do so, but I am leaving town on July 16th for a couple of weeks and if such a meeting is deemed necessary, it should take place immediately. Thank you for your understanding.

LG:tmp

cc: President Edward T. Foote II



MEMORANDUM

July 29, 1998

CDFHI

To: Dr. M. Lewis Temares, Dean, CoE

From: Tzay Y. Young, Chair, ECE Department *Tzay Y. Young*

Copies to: Dr. Luis Glaser, Provost
Dr. David L. Wilson, Chair, Faculty Senate
Dr. Steve Green, Incoming Chair, Faculty Senate
Dr. Kumble Subbaswamy, Dean, Arts & Sciences
Dr. Alan Zame, Chair, MCS Department

Subject: Proposed Agreement for Coordination of CS and CE courses

I have received a copy of the memorandum of July 24, 1998, from Dean Subbaswamy to you. I am distressed that he cancelled the July 29 meeting, depriving us the opportunity to explain the reasons for the ECE amendments on the proposed "agreement".

There are disagreements on two issues. The first is on the assignment of non-tenure track faculty to computer courses. I respect Dean Subbaswamy's interest in improving research which we all share; however, a major mission of any university is teaching. When a department assigns faculty to teaching undergraduate students, it should be mainly based on teaching performance, and this is precisely what we proposed in the amendment. Also, I get the impression that the issue was raised originally because of personal reasons against one of our non-tenure track full-time faculty who is an excellent teacher. It makes no sense to us to let personal and emotional reasons affect a formal agreement.

I would like to quote the several versions of the proposed agreement with regard to this issue:

"The assignment of non-tenure track faculty to teach courses should be carefully monitored by both deans to assure high quality for the courses." - Deans' proposed agreement, Nov. '97.

Department of Electrical and Computer Engineering
P.O. Box 248294
Coral Gables, Florida 33124-0640
Phone: 305-284-3291
Fax: 305-284-4044
E-mail: ecc@eng.miami.edu

"The assignment of non-doctorate faculty to teach courses . . ." - as amended by ECE faculty, Nov. '97.

"The assignment of non-tenure track faculty to teach courses . . ." - MCS faculty, Dec. '97.

After seven months of intense negotiation, the two deans proposed the following, which is also the view of the MCS faculty.

"Regular, tenure-track faculty of either program shall have precedence in teaching these courses over non-tenure track faculty . . . To the maximum extent possible, all courses at the 300- and above levels should be taught by regular, tenure-track faculty. Since each department will depend heavily on the courses offered by the other department, the hiring of non-tenure track faculty who will teach courses in either program should be overseen by the Coordinating Committee. Each program should work to achieve this goal by the year 2001." - Deans' proposed agreement, June '98.

This imposes a much stronger and stringent constraint on the hiring and course assignment of non-tenure track faculty. Any serious and good-faith negotiation would narrow the differences between the two parties and seek compromise. The above proposed item moved in the wrong direction, and significantly expanded the differences. It makes one wonder whether Dean Subbaswamy and the MCS faculty are seriously interested in an agreement, knowing that the stronger constraint would only exacerbate the difficult negotiation.

The ECE faculty amended this item into the following:

"The best available full-time faculty of either program (based on peer and student teaching evaluation) shall have precedence in teaching these courses over other faculty . . . To the maximum extent possible, all computer courses at the 300- and above levels should be taught by full-time faculty. The hiring of full-time computer faculty who will teach courses in either program should be done after consultation with the Coordinating Committee." - as amended by ECE faculty, July '98.

We believe that this is more reasonable and realistic, since here we are dealing with teaching and course assignment, not research.

The other issue is concerned with shared courses. The MCS faculty believe that there are six courses that should be designated as shared courses, while the ECE faculty believe there are only three. Our reasoning is based on current facts as shown in the 1997-

98 UM Bulletins, not on historical controversies. All six courses are listed in the 97-98 Bulletin as EEN courses (including EEN 621 which was changed recently to EEN 572), and only three of the six courses are listed as MTH courses. We have offered to make EEN 521 to be a fourth shared course as a gesture of good will. Overall, the two faculties have agreed on 53 computer courses, including the 4 shared courses. The disagreement on this issue now involves two courses only.

Finally, I would like to say that I appreciate very much Dean Subbaswamy's support in the passage of the B.S.I.T. program, and he is sincere in advocating research. I also believe that the ECE and MCS faculty have made significant progress toward an agreement. We are all for good teaching and good research. The non-tenure track faculty issue is basically a non-issue if we can remove the personal and emotional elements, and realize that it has very little to do with research. I sincerely believe that with good faith and good will, the two departments can reach an acceptable agreement.

TYY/mp

KY



MEMORANDUM

June 18, 1998

To: ECE Faculty
From: K. Yacoub, Acting Chair *K.Y.*
Subject: Proposed coordination between CE & CS

This week our department received the attached draft agreement proposed by Deans Temares and Subbaswamy. The document was addressed to the members of the CE-CS Coordinating Committee and a meeting to finalize this proposal and submit it to the Provost was called for Tuesday, July 7.

I believe that the content of this draft agreement have very serious implications on our ability to function as a normal department responsible for its programs and their accreditation. Therefore, I am calling an ECE faculty meeting for Monday, July 6th at 11:00 a.m. in EB 409. By then both Tzay and I will be on campus. The purpose of the meeting will be to give our instructions to the Committee that will represent us at that meeting the next day.

To help us prepare for that meeting, I am attaching copies of the above document and my own proposed amendments for your consideration. Please let me know your opinion of the document, the proposed amendments and other amendments you may wish to propose so that we can finalize our draft at our Monday meeting.

KY/mp

Department of Electrical and Computer Engineering
P.O. Box 248294
Coral Gables, Florida 33124-0640
Phone: 305-284-3291
Fax: 305-284-4044
E-mail: ece@eng.miami.edu



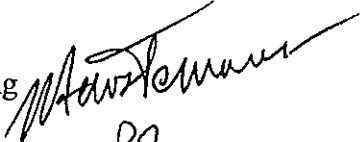

COLLEGE OF ARTS AND SCIENCES

Office of the Dean

MEMORANDUM

TO: Mansur Kabuka, professor
Philip Liu, professor
Tzay Young, chair and professor
Department of Electrical and Computer Engineering

Victor Milenkovic, associate professor
Dilip Sarkar, associate professor
Alan Zame, chair and professor
Department of Mathematics and Computer Science

FROM: M. Lewis Temares
Dean, College of Engineering 
Kumble R. Subbaswamy
Dean, College of Arts and Sciences 

DATE: June 9, 1998

SUBJECT: CS/CE

First of all, we want to thank all of you for working so hard to arrive at an arrangement for CS and CE courses that address the various concerns raised by the Provost. Clearly, it is in the best interests of the University to tie up all loose ends and start hiring faculty as soon as possible. Towards that end, and pursuant to our discussions with you and with the Provost, we suggest the following compromise agreement between the two Colleges. A meeting will be scheduled shortly to finalize the draft to be presented to the Provost. We hope that after our discussions we can turn to more constructive issues such as the sharing of facilities and resources, strategies for increasing enrollments, etc.

Agreement between the College of Engineering and the College of Arts & Sciences
concerning computer engineering and computer science courses.

(June 9, 1998)

Page 1

1. The course offerings in the CS and CE programs will be coordinated by a CS/CE Coordinating Committee appointed jointly by the deans of the Colleges of Engineering and Arts & Sciences. The chair of this Committee should rotate once a year, alternating between the two departments. Where there are matters that cannot be resolved within this Committee, such matters will be referred to the two deans (and the Provost, where necessary) for resolution.
2. There should be no unnecessary duplication of courses at any levels. That is, in any given academic year, two courses that have substantial overlap in content cannot be offered unless it is justifiable by enrollments. If this rule is violated, the Provost will impose a budget penalty of not less than \$10,000 each on the two departments for the following year.
3. The enclosed Appendix gives the details of the agreement pertaining to courses in the two programs. The common designation CPT has been assigned to many of the courses, and a home department has been assigned for almost all courses as shown in the Appendix.
4. There are six 500-level courses that will be designated as shared courses (listed as such in the Appendix). The College of Engineering and the College of Arts & Sciences shall alternate as the "teaching school" for these courses. The offering of these courses will be subject to the enrollment guidelines and penalties indicated in paragraph 2 above. Regular, tenure-track faculty of either program shall have precedence in teaching these courses over non-tenure-track faculty.
5. The faculty of the CE and CS programs should be assigned to courses so as to maximize the benefit to students and to best use the available expertise regardless of the home school of the faculty member.
6. To the maximum extent possible, all courses at the 300- and above levels should be taught by regular, tenure-track faculty. Since each department will depend heavily on the courses offered by the other department, the hiring of non-tenure-track faculty who will teach courses in either program should be overseen by the Coordinating Committee. Each program should work to achieve this goal by the year 2001.
7. Tenure-track faculty in either program should be hired with a view towards achieving a healthy balance between the teaching and research needs of the entire computing area encompassing both departments. While ensuring that all courses at all levels can be adequately covered, the areas of research expertise of new hires might overlap where research funding opportunities might be enhanced by

DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT

Agreement between the College of Engineering and the College of Arts & Sciences
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(June 9, 1998)

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doing so. The Coordinating Committee will give advice and monitor the hiring of new faculty in either program. The two deans will coordinate the hiring in their schools to achieve a strong, competitive academic and research program at the University of Miami.

Kumble R. Subbaswamy
Dean, College of Arts & Sciences

M. Lewis Temares
Dean, College of Engineering

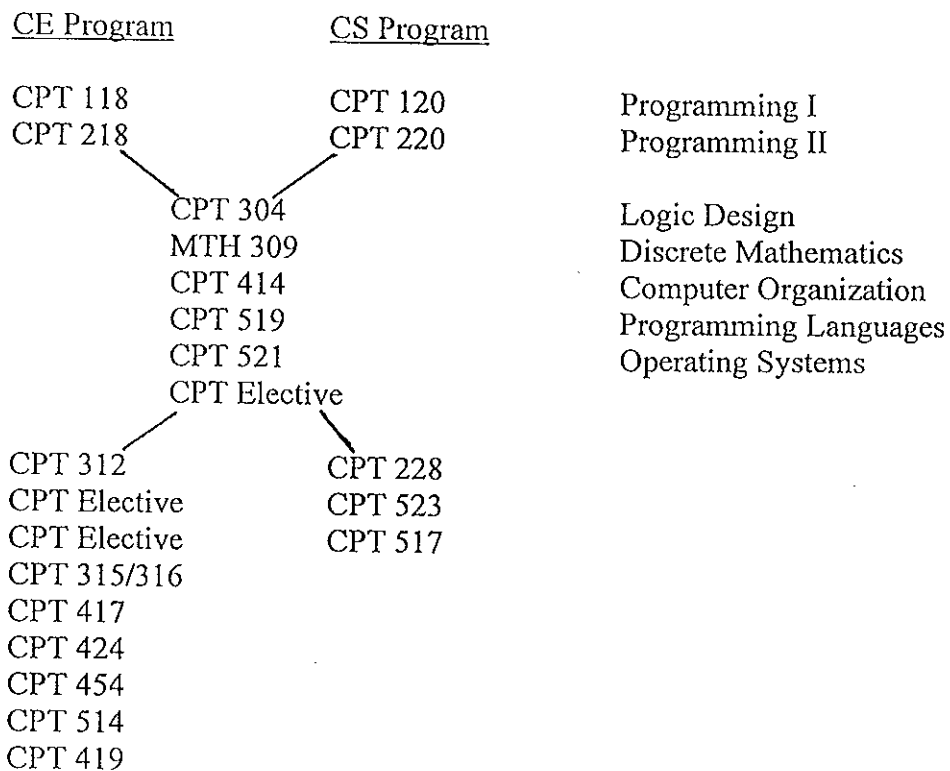
Luis Glaser
Executive Vice President and Provost

Agreement between the College of Engineering and the College of Arts & Sciences
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APPENDIX

Since the second reading of the Information Technology Proposal at the Faculty Senate Meeting on February 23, 1998, the CS/CE Curriculum Committee (Profs. Kabuka, Liu, Milenkovic, Sarkar, Young, and Zame) has met three times on February 27, April 3, and April 10. In addition, the two deans and two chairs met on March 23, 1998.

1. It was agreed that the common designation would be CPT.
2. Computer Engineering – Computer Science Curriculum



3. The committee assigned home departments (MCS or ECE) to 49 CPT courses. The committee was unable to reach an agreement on six CPT courses. The committee also discussed briefly areas of specialization of new faculty to be recruited and was unable to reach an agreement.

Agreement between the College of Engineering and the College of Arts & Sciences
concerning computer engineering and computer science courses
(June 9, 1998)

APPENDIX

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Computer Science

- 120 Programming I
- 220 Programming II
- 228 Assembly Language Programming
- 322 C and UNIX
- 517 Data Structures and Algorithms
- 518 Interpreters and Compilers
- 527 Theory of Automata
- 529 Introduction to Computer Graphics
- 540 Algorithm Design and Analysis
- 544 Computer Modeling
- 555 Multimedia Systems
- 606 Logic Programming
- 609 Cryptography and Data Security
- 611 Theory of Computation
- 612 Complexity Theory
- 623 Theory of Relational Databases
- 628 Parallel Algorithms
- 645 Expert Systems
- 646 Neural Computing
- 655 Advanced Multimedia Systems

Computer Engineering

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- 315 Digital Design Laboratory
- 316 Structured Digital Design
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- 414 Computer Organization and Design
- 417 Embedded Microprocessor System Design
- 454 Digital System Design and Testing
- 470 Object Oriented Windows
- 512 Objected Oriented Software Engineering
- 514 Computer Architecture

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Computer Engineering (continued)

- 532 VLSI Systems
- 534 Computer Communication Networks
- 544 Application Specific Integrated Circuits (ASIC) Design
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- 547 Intro. to Expert Systems
- 553 Neural Networks
- 571* Interactive Multimedia Information Systems
- 570* Network Client/Server Programming
- 573* Network Computing: The Enterprise Architecture
- 574* Agents Technology
- 614 Advanced Computer Architecture
- 634 Model and Analysis of Computer Networks
- 638 Computer Vision
- 650 Fault Tolerant Computer Design

Shared Courses

- 511 Software Engineering
- 519 Programming Languages
- 521 Operating Systems
- 523 Databases
- 545 Introduction to Artificial Intelligence
- 572* Objection Oriented and Distributed Database Management Systems

Amendment Proposed by K. Yacoub

Cross out language as shown.

Insert the following phrases at the appropriate places. *(as shown)*

- The scheduling of certain courses
- after consultation with the respective departmental Faculty
- relating to course scheduling
- history. Therefore, such course offering will be planned ahead by the two chairs and approved by the Deans
- will be cross-listed with
- The best available Doctoral
- based on teaching evaluations
- done after consultation with the
- Approved by the Faculty of the Department of Math & Computer Science at its regular meeting held on _____
- Approved by the Faculty of the Department of Electrical and Computer Engineering at its regular meeting held on _____

Chair, MTH

Chair, ECE

- Courses (to be listed under MTH & CPT)
- Courses (to be listed under EEN and CPT)
- (to be listed under MTH - EEN and CPT)

Agreement between the College of Engineering and the College of Arts & Sciences concerning computer engineering and computer science courses. (June 9, 1998)

The scheduling of certain courses

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4. There are ^{four} ~~six~~ 500-level courses that will be designated as shared courses (listed as such in the Appendix). The College of Engineering and the College of Arts & Sciences shall alternate as the "teaching school" for these courses. The offering of these courses will be subject to the enrollment guidelines and penalties indicated in paragraph 2 above. Regular, ~~tenure-track~~ ^{teaching in} faculty of either program shall have precedence in teaching these courses ~~over non-tenure-track faculty~~.

based on teaching evaluations

The best available Doctoral

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Doctoral

6. To the maximum extent possible, all courses at the 300- and above levels should be taught by regular, ~~tenure-track~~ ^{teaching in} faculty. Since each department will depend heavily on the courses offered by the other department, the hiring of non-tenure-track faculty who will teach courses in either program should be overseen by the Coordinating Committee. Each program should work to achieve this goal by the year 2001.

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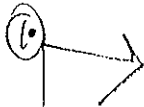
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Agreement between the College of Engineering and the College of Arts & Sciences
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(June 9, 1998)

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Kumble R. Subbaswamy
Dean, College of Arts & Sciences

M. Lewis Temares
Dean, College of Engineering

Luis Glaser
Executive Vice President and Provost

Approved by the Faculty of the Department of Math & Computer Science
at its regular ^{or} meeting ^{by called} held on -----

Approved by the Faculty of the Department of ~~Math~~ Electrical and
Computer Engineering at its regular ^{or} meeting ^{by called} held on -----

Chair - MTH

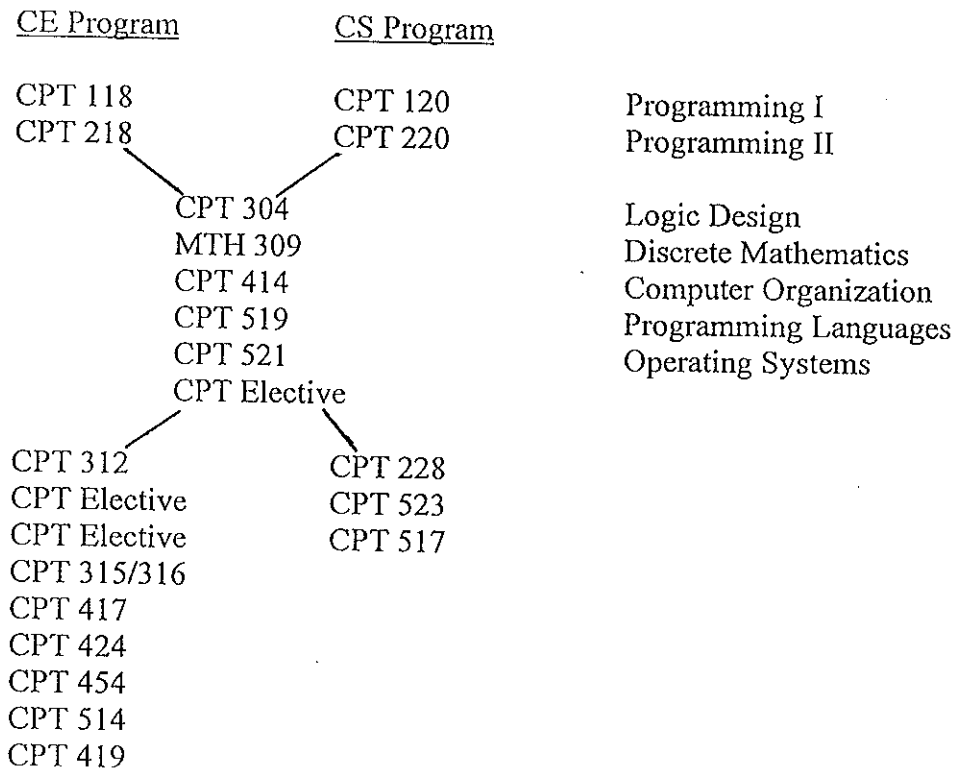
Chair ECE

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Computer Engineering Courses (to be listed under EEIV and CPT)

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Agreement between the College of Engineering and the College of Arts & Sciences
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- 574* Agents Technology
- 614 Advanced Computer Architecture
- 634 Model and Analysis of Computer Networks
- 638 Computer Vision
- 650 Fault Tolerant Computer Design
- 572

Shared Courses (*to be listed under MTH - EEN and CPT*)

- ~~511~~—Software-Engineering
- 519 Programming Languages
- 521 Operating Systems
- 523 Databases
- 545 Introduction to Artificial Intelligence
- ~~572*~~ Objection Oriented and Distributed Database Management Systems.

The President then asked Mr. David Lieberman, Senior Vice President, to address the issue of outsourcing the bookstore and the possibility of its relocation. According to Mr. Lieberman, the University has asked for bids from five companies, which will then need to be evaluated by the administration and the Senate's Administrative Services Committee. In response to a query about how present employees will be affected, Mr. Lieberman stated that the University will require responsible actions of a winning bidder by guaranteeing employment for a limited time and then providing a rationale for any changes they would want to make. Professor Berman asked whether the funds generated by outsourcing will be given directly to the Coral Gables campus or will the Medical School bookstore still maintain control over the monies they receive. Mr. Lieberman's responded that all Medical School bookstore surpluses would continue to be the property of the Medical School and will fund scholarships, as has been the case for several years. He also said there would be no cost increase for books for students with outsourcing the bookstore. Professor Clasby inquired whether consideration had been given to the bookstore employees' retirement benefits.

Mr. Lieberman went on to say that an article in the *Chronicle* indicated that for the year ending June 30, endowments were up 21.9%, not only from investment return but also from gifts and other sources. The University's investment return in the growth pool was 19.5%.

Approval of the Minutes

The minutes of the January 26 meeting were approved as submitted. Excused absences were approved for Professors Chandar, Curtis, Dreyer, Fishman, Mash, Peterson, Warren and Yacoub.

Proposal for the Bachelor of Science in Information Technology (Second Reading)

Professor John Stewart, Chair of the ad hoc committee to review the proposal for the Bachelor of Science in Information Technology, presented an update for the second reading of the proposal. He reminded the Senate that two issues were of concern at the last Senate meeting: 1) the scope of the demand for information technology professionals; and 2) what plan is in place for the elimination of duplication of courses between the Department of Mathematics and Computer Science and the Department of Electrical and Computer Engineering. Professor Stewart cited several sources that explained job opportunities in the information technology field. In an effort to work out an agreement between the departments, Professor Stewart noted there is now a scheduled committee meeting each week. The committee consists of the two deans, the two chairs, and two faculty members from each department. There has been substantial progress in resolving the remaining issues, according to Professor Stewart. Dean Temares and Dean Subbaswamy spoke about the merits of the program and the reasons for approving it. Discussion followed and members of the Department of Mathematics responded to several questions from the body. Professor Sumanth urged approval of the proposal and informed the Senate that the Executive MBA, Master of Science in Industrial Engineering program was a similarly cooperative venture that has continued for over fifteen years. It was *moved* and seconded to

approve the proposal by adding the condition that a report from the Deans shall be forwarded to the Senate as to the resolution of the remaining issues at the earliest possible time. It is the understanding of the Senate that the resolution of issues may occur in ways other than those outlined in the proposal. Provost Glaser reiterated his commitment to the success of the new program and recommended its approval. The *motion carried*.

Academic Standards Committee Report on the Drop Date

Professor Tom Steinfatt, a member of the Academic Standards Committee, presented the Committee's report and recommendation with regard to moving the drop date from the sixth to the tenth week of the semester. They felt that the best way to serve students would be to give the students two exams before the drop date. Following discussion, it was *moved* and seconded to approve the recommendation. The *motion failed*.

Away Tuition Proposals

The report on proposals for away-tuition, prepared by Professors Clasby, Dreyer, and Hill, was discussed. Three options were identified in the proposal as possible scenarios for the program. It was suggested that the members of the UMMG plan should not vote on the proposal. Professor Oxman distributed a summary of points in opposition to a mandatory away-tuition proposal. He then proposed that a vote be taken on the option of individual choice. Professor Green informed the Senate that it was decided some time ago that the UMMG funding would be kept entirely independent from a single pool of funds that would apply to all other participants in a separate plan. Professor Munter suggested that one alternative to the proposal would be for the University to participate in a consortium program which would function as an extended tuition-remission program. Several comments were made in opposition to a mandatory program. It was *moved* and seconded to approve Option 2, Section (1)(a)(b)(c)(ii)(a). The vote was by secret ballot. The Chair thanked the Committee for its work and for the participation of the Senate. The *motion to approve Option 2 failed*, by a vote of 14 in favor with 20 opposed. In response to a question about whether the status quo would preclude an individual school from presenting a plan for its own people, the President said he did not think it would preclude any school from bringing forward any proposal. Any proposal would be considered on its merits. It was *moved* and seconded to retain the status quo. The *motion carried*.

Monies sequestered by the Provost for the establishment of an away-tuition program would now be available for benefit enhancement, according to Professor Green. He presented three possible benefits that will be considered by the Employee Benefits Committee and requested instruction by the Senate as to the priority of each. The enhancements would apply to the following areas: 1) long-term disability; 2) participation and funding for a long-term care program; and 3) an enhanced UM contribution to the dental plan. It was *moved* and seconded to instruct the Senate Chair to negotiate with the Provost and the President that the \$250,000 is returned to the salary pool as quickly as possible. The *motion carried*. The one-time amount should also be put into

Bachelor of Science in Information Technology (First Reading)

Professor John Stewart, Chair of the Ad Hoc Review Committee, reported on the committee's investigation of the proposal for the Bachelor of Science in Information degree, and its subsequent approval. He mentioned that the proposal combines electrical engineering with basic computer courses, with a strong emphasis on the computer end. Deans Subbaswamy and Temares have discussed the details of the program. The Committee recommended approval of the program. It was suggested that before the second reading, a resolution of the remaining issues between Computer Engineering and Computer Science should be in place. If an impasse exists, a written document should be prepared for discussion with both deans at the Senate meeting. The second reading will be scheduled when the committee is ready. Professor Oxman asked for reaction to the proposal from the relevant faculty, not just the chairs.

It was suggested that when proposals are brought forward for Senate discussion in the future, the relevant faculty should be notified.

Report from the Distinguished Faculty Scholar Committee

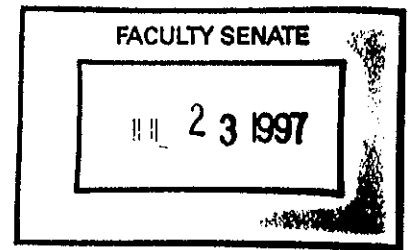
Professors Frank Millero, former Distinguished Faculty Scholar, presented the Committee's report and recommendation that Professor J. Maxwell McKenzie, Chairman Emeritus of the Department of Medicine, be awarded the 1998 award. The Senate unanimously approved the recommendation.

Proposed Center for Research on Sports in Society

The Chair indicated that a request would be forthcoming from the College of Arts and Sciences for Senate approval of the name for a proposed Center for Research on Sports in Society. Professor Wilson explained that the *Faculty Manual* defines an Independent Center and an Institute or Sponsored Center. It appears that the proposed Center falls into the second category, Section B6.6, of the *Faculty Manual*. One Arts and Sciences Senator stated that most of the faculty of the College does not know of the existence of such a program and that the information should be circulated. Professor McKenry noted that the School of Education has a similarly named program and that any possible conflict should be considered. It was pointed out that the faculty of the College of Arts and Sciences need to approve the new Center, and that information about the Center should not have been distributed prior to the approvals of the faculty, Senate, and President.



MEMORANDUM



DATE: July 18, 1997

TO: Dr. David L. Wilson, Chair, Faculty Senate

FROM: Dr. M. Lewis Temares, Dean, College of Engineering

RE: New Baccalaureate Degree Program

Attached is a proposal for a new baccalaureate degree program in the College of Engineering, the Bachelor of Science in Information Technology. This proposal was approved unanimously by the Faculty of the College of Engineering on April 23, 1997.

I fully endorse this proposal, including the proposed annual budget on page 4 of the proposal. The annual budget starts at \$20,000 for the 1998-99 academic year and increases gradually to \$273,000 for 2002-03 and thereafter, all in 1997 dollars. Please initiate the process of Faculty Senate consideration of this new degree program.

The new Information Technology program is to be administered by the Department of Electrical and Computer Engineering. Please contact Dr. Tzay Young, the department chair, with any questions on the proposed degree program and/or requests for any additional materials. The chairs of the Department of Mathematics and Computer Science and the Department of Computer Informations Systems have received copies of the program. Thank you in advance for your efforts on our behalf.

MLT:fc
Attachment

cc: Dr. Tzay Young, Chair, Dept. of Electrical and Computer Engineering
Dr. Samuel S. Lee, Associate Dean
Dr. Thomas D. Waite, Associate Dean, Research and Graduate Studies
Dr. Luis Glaser, Executive Vice President and Provost

College of Engineering
Office of the Dean
P.O. Box 248294
Coral Gables, Florida 33124-0620
305-284-2404
Fax: 305-284-3815
<http://www.eng.miami.edu>

COLLEGE OF
ENGINEERING



1947-1997
Creating
21st Century
Leaders

Dean

M.L. Temares
(94-97)

V. Beck
(91-94)

S. ...
(90-91)

A.G. Einspahr
(77-90)

H.P. ...
(57-77)

J. ...
(72-75)

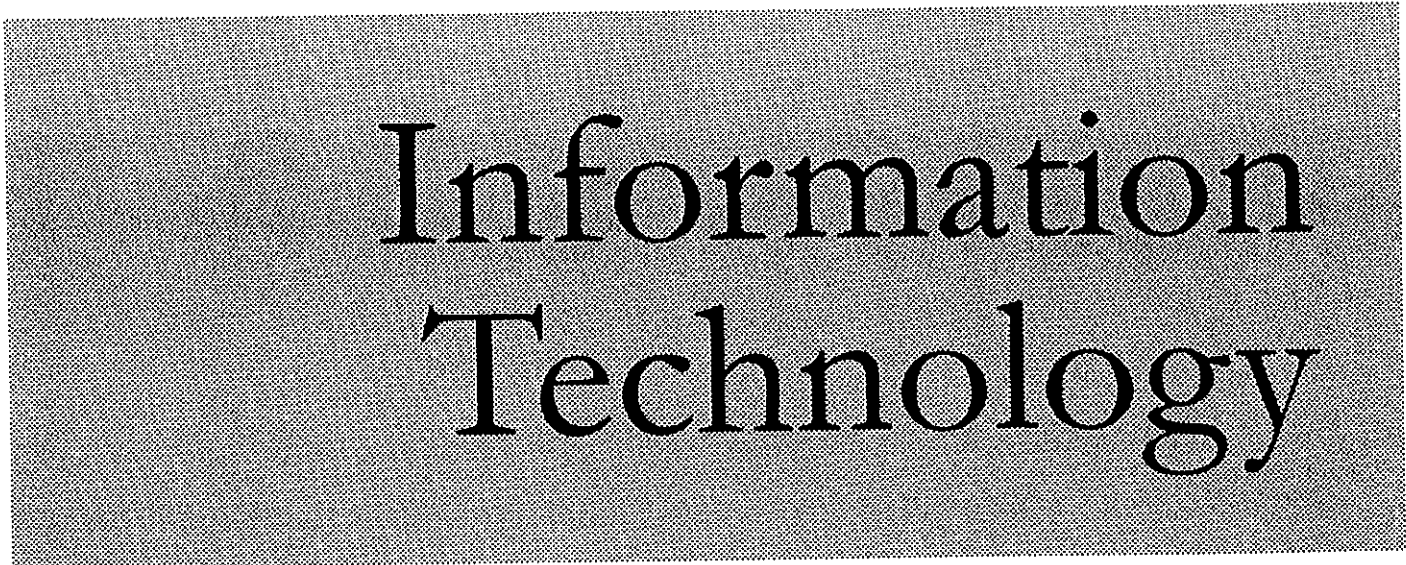
D.A. ...
(70-72)

W.C. ...
(66-71)

T.A. ...
(57-65)

J.H. ...
(47-58)

Bachelors of Science in



**Information
Technology**

at

**Department of Electrical and
Computer Engineering**

College of Engineering

Bachelors of Science in Information Technology

Recent advancements in world wide information infrastructure will dramatically change our lives. This change is no less dramatic than that brought by the printing press invented in the fifteenth century first initiated by Johann Gutenberg¹. Whereas it took centuries for mankind to fully benefit from this new technology, information technology has already penetrated our lives within two decades. Information technology includes computers, computer networks, phone system, and broadcast media. These media of communication are universally available – day and night at our homes and at work, whenever and wherever they are needed. The modern technology infrastructure is able to handle information of all sorts including text, graphics, audio and video, data and knowledge.

Modern information infrastructure provides us with easy access to distributed and heterogeneous information and services (related to shopping, entertainment, education, healthcare, law, politics, etc.). It also supports collaborative work among individuals from different organizations with different interests and different abilities. These technologies will also effect the way we deliver and receive education, electronic commerce, and healthcare records amongst other aspects of human society.

Information technology is radically altering the way software systems are developed and deployed to achieve the competitive advantage for large corporations. It changes the economics and possibilities of application development. These changes have significantly expanded their Information Systems departments. Furthermore, easy access and manipulation of information has made many small businesses appear and survive relying heavily on the modern information infrastructure. These factors have created a significant number of job opportunities for information technology specialists.

Consequently, a large force of specialists will be needed who are aware of all aspects of information technology including techniques for encoding, storage, communication, manipulation and use of information in digital form. Traditionally each of these technologies has been considered a distinct area and different experts typically were trained in the different areas. Whereas large corporation are able to maintain experts in all necessary areas, medium and small organization usually suffer from shortage of experts who can handle all aspects of their networking and computing needs. Hence the need for experts in the broad areas of information technology is increasing.

1.1 Distinguishing Aspects of Program

Information Technology differs significantly from typical Computer Engineering and Science (CES) programs. In addition to computing, Information Technology places emphasis on computer connectivity, communication, system integration, interactive multimedia design, network computing, agent technology, information modeling, information processing, high performance computing, and technology deployment. It encompasses the full range of human communications including animation, simulation, virtual reality, video and sound. In the area of telecommunications, it places a new emphasis on broad bandwidth communication to establish a richer interface between humans and information.

¹ The Gutenberg Bible was published at Mainz, France, by local printer Johann Gutenberg, 56, is a Vulgate bible that marks one of the earliest examples of printing from movable type in Europe in 1456. Gutenberg took 5 years to produce the bible, printing it in two volumes, folio, with two columns of 42 lines each per page.

1.2 Information Technology Education

The information technology education offered by this programs will go beyond that of being a mere means of transferring technical education to students. It will provide them with tools that will enable them to discover, formulate and then solve real life problems that enterprise faces.

The nature of complex problems in modern organizations requires an information technologist to systematically analyze problem areas to determine the most efficient cost-effective solutions. The over-all design of the curriculum, and teaching methodologies will be geared towards building student skills in two related areas: Analysis of requirements and group problem solving. The students will have full capability of solving real life challenges based on their thorough understanding of Object Oriented analysis techniques, and extensive experience in solving real life problems through group interactions.

Throughout the curriculum, by posing real problems to group of students as examples, emphasis will be placed upon the steps in creative problem solving, the basics of meeting planning to maximize group effectiveness, and helping a client to focus his concerns into a clearly defined problem.

2. IT Program at UM

2.1 Mission

The Information Technology (IT) program at University of Miami will train students in state-of-art technologies required for a successful career in the areas of computer network, network computing, communications, information modeling and information processing in the new enterprise model. The curriculum will prepare the students to solve real problems in real organizations.

2.2 Exact Title of Degree

Bachelor of Science in Information Technology.

2.3 Assessment of Demand and Job Market

There is a great demand for individuals that are aware of all aspects of modern information technologies. This demand exists today which is indicated by the high salaries companies are willing to pay to attract quality individuals. In future, further enhancements in information technologies are expected that will further proliferate information technologies into the general society requiring more experts to maintain and handle related infrastructure.

Information technology positions are found in government, business, and industry at all levels. Presently, there are well defined positions as computer engineer, system analyst, programmer, network manager, computer technologist, systems integrator, multimedia developer, facilities manager, or database administrator. Students will be capable of providing the organization with the skills necessary for the day to day operation of computing infrastructure. Their knowledge and experience in interactive media, telecommunications, and interface design will make them especially valuable.

2.3.1 Survey of the Job Market

The range of areas covered by Information Technology program include telecommunications, interactive multimedia design, information storage and organization, computer-human interaction, microcomputers, and computer programming. Each of these areas has shown tremendous growth, and the trends indicate that the growth will continue in future. It is estimated that the combined corporate network computing

market will jump from \$12 billion in 1995 to \$208 billion by the year 2000². Bureau of Labor Statistics', 1996-1997 *Occupational Outlook Handbook*³ lists information, computer and network related jobs as fastest growing occupations growing at Bachelor's level. It also lists some of these jobs as having the largest numerical increase in employment during the period 1994-2005. 1995 IEEE U.S. Membership Salary and Fringe Benefit Survey, declares the jobs in related areas as the best paid⁴. Since, the information technologist will have a broader range of expertise that would cover all aspects of jobs covered by these surveys, and will also be prepared to handle futuristic aspects, we anticipate an even better opportunities for our graduates.

2.4 Resources: Laboratories

1. Network Computing Laboratory (New)
2. Multimedia Laboratory (Arnold Center for Confluent Media Studies)
3. Software Engineering Laboratory
4. Telecommunication and Networking Laboratory
5. Microprocessor Laboratory
6. Image Processing Laboratory
7. Digital Signal Processing Laboratory

2.5 Budget Analysis

The estimated enrollment in the fourth year is 50. The budget needs include salaries and fringe benefits to two new faculty (Assistant/Associate level), a part-time staff and two teaching assistants, phased in over five years.

Table 1: Budget Analysis in 1997 Dollars

Budget Year	1998-99	1999-00	2000-01	2001-02	2002-03
Revenue					
Estimated Enrollment	10	23	36	50	50
Tuition generated	\$180,000	\$414,000	\$648,000	\$900,000	\$900,000
Financial Aid (27%)	\$48,600	\$111,780	\$174,960	\$243,000	\$243,000
Net Revenue	\$131,400	\$302,220	\$473,040	\$657,000	\$657,000
Expenses					
Faculty (Salary & FB)			\$90,000	\$90,000	\$180,000
Part-time staff (Salary & FB)				\$15,000	\$15,000
Teaching assistants (Inc. Tuition)			\$24,000	\$24,000	\$48,000
Equipment & Operating Costs	\$20,000	\$30,000	\$30,000	\$30,000	\$30,000
Total Expenses	\$20,000	\$30,000	\$144,000	\$159,000	\$273,000
ECE Costs/Net Revenue	15.2%	9.9%	30.4%	24.2%	41.6%

² Estimates by a research firm in Mountain View, California.

³ <http://stats.bls.gov/oco/ocotjt1.htm>

⁴ The highest median incomes were reported by engineers in communications (\$70,138), and computers (\$69,929): 1995 IEEE U.S. Membership Salary and Fringe Benefit Survey

3. Faculty

Name	Specializations
Dr. Mansur R. Kabuka	Information Technology and Medical Informatics
Dr. John W. Collins	Object Oriented Programming and Artificial Intelligence
Dr. Christos Douligeris	Telecommunications and Computer Networks
Dr. Philip S. Liu	VLI Design, Computer Architecture, and Object Oriented Programming
Dr. Saeed A. Rajput	Information Integration, Telecommunications, and Software Engineering
Dr. Michael S. Scordilis	Digital Signal and Speech Processing
Dr. Moiez A. Tapia	Fault Tolerance, and Object Oriented languages.
Dr. Tzay Y. Young	Computer Vision, Image Processing and Pattern Recognition

Currently we have one open faculty position in the area of database systems. We plan to recruit two additional faculty members in the area of information technology when the enrollment reaches the target as proposed.

4. New Courses

In following sections we provide detailed description of each new course.

4.1.1 EEN 4xx: Internet & Intranet: JAVA Computing

Object Oriented modeling concepts. Introduction to JAVA language. JAVA constructs and exceptions. Building and constructing JAVA applets. Java Tools: compiler, applet viewer and debugger. JAVA classes, JAVA graphical user interfaces, JAVA networking.

4.1.2 EEN 4xx: Object Oriented Windows

Introduction to message driven windows. Windows programming techniques and components including resource, device context, controls, and serializable objects. Document/view objects architecture, multitasking and object sharing.

4.1.3 EEN 5xx: Agents Technology

Agent definition and applications, agent modeling and theories, agent representation (KIF), agent behavior, ethical and emotional agents, agent communication languages (KQML), agent development environments and tools, agent systems (Cooperative agents, Interface agents, Information agents, learning agents, believable agents, agents for workgroups, mobile agents), and agent case studies (Internet spiders, softbots, workflow robots, knowbots).

4.1.4 EEN 5xx: Distributed Systems and Object Oriented Database Management

Object-Oriented modeling concepts in languages and database systems. Object Oriented database systems. Semantic data models, nested-relational object-relational databases. Distributed database system. Federated Databases. Application to engineering design problems.

4.1.5 EEN 5xx: Network Computing: The New Enterprise

Enterprise's Internet and Intranet architecture: scalability, language independence, and high availability. High performance computing: clustering and performance analysis. Integration through standards: object management model, reference object model, and IDL language. Directory services, Security: symmetric and public cryptography.

4.1.6 EEN 5xx: Interactive Multimedia Computing

Interactive multimedia technologies include hardware, software, standards, concepts and issues. Compression, Decompression, user interface design, query by content, multimedia indexing, and distributed multimedia.

4.1.7 EEN 5xx: Network Client-Server Programming

Introduction to server-client systems. Internet server-client communication programming. Advanced server-client design and implementation based on distributed component object model in Windows, Unix, and VMS.

4.1.8 EEN 5xx: Speech and Audio Processing

Introduction to human speech production, hearing and perception, speech and audio signal analysis in time and frequency, speech and audio coding, speech synthesis and recognition, speaker recognition, language modeling and human-machine spoken interaction.

5. Curriculum

Bachelor of Science in Information Technology

A. General

	Course Title	Credits
	Social Sciences/Humanities Electives	18
ENG 105	English Composition	3
ENG 107	Scientific Writing	3
MTH 110	Calculus I	5
MTH 112	Calculus II	4
MTH 210	Vectors and Matrices	3
PHY 205	University Physics I	3
PHY 207	University Physics III	3
PHY 209	University Physics III Lab	1
xxx 111	Introduction to Engineering I	3
xxx 112	Introduction to Engineering II	2
	Subtotal	48

B. Required Courses

	Course Title	Credits
EEN 118/MTH 120	Introduction to C and Software Engineering.	3
EEN 201	Electrical Circuit Theory	3
EEN 304	Logic Design	3
EEN 312	Microprocessor	4
IEN 311	Applied Probability and Statistics	3
EEN 315	Digital Design Lab	1
EEN 317/MTH 220	Engineering Data Structures in C++	3
EEN 404	Communication Systems	3
EEN 414	Computer Organization and Design	3
EEN 436	Digital Signal Processing (DSP): Multimedia Approach	3
EEN 4xx	Internet & Intranet: JAVA Computing	3
EEN 512	Object-Oriented Software Engineering	3
EEN 534	Computer Communication Networks	3
CIS 520	Analysis of Information Systems	3
CIS 540	Telecommunication: Introduction and Fundamentals	3

EEN 521/ MTH 521	Computer Operating Systems	3
EEN 523/MTH523	Principles of Database Systems	3
EEN 5xx	Network Client-Server Programming	3
EEN 5xx	Interactive Multimedia Computing	3
EEN 5xx	Network Computing: The New Enterprise	3
EEN 5xx	Distributed Systems and Object-Oriented Database Management	3
	Subtotal	62

C. Electives (Select Three Courses)

	Course Title	Credits
EEN 5xx	Agents Technology	3
EEN 4xx	Object Oriented Windows	3
EEN 5xx	Speech and Audio Processing	3
MTH 517	Data Structures and Algorithm Analysis	3
EEN 537/MTH 545	Artificial Intelligence	3
EEN 538	Introduction to Digital Image Processing	3
EEN 553	Neural Networks	3
EEN 548	Machine Learning	3
EEN 514	Computer Architecture	3
EEN 546	Reliable Digital System Design	3
MTH 529	Introduction to Computer Graphics	3
MTH 544	Computer Modeling	3
EEN 519/MTH 519	Programming Languages	3
	Subtotal	9

D. Senior Project

	Title	Credits
	Senior Project	3
	Subtotal	3

Grand Total = 122 credits

6. Detailed Description of new Courses

6.1 EEN 4xx:

Title: Internet & Intranet: JAVA Computing

Course Description

Object Oriented modeling concepts. Introduction to JAVA language. JAVA constructs and exceptions. Building and constructing JAVA applets. Java Tools: compiler, applet viewer and debugger. JAVA classes, JAVA graphical user interfaces, JAVA networking.

Prerequisite: Background in Programming

Textbook: TBA

Course Coordinator: Professor Mansur R. Kabuka

Topics

- ◆ Object Oriented Modeling concepts
 - classes and methods
 - inheritance
 - dynamic binding and polymorphism
 - abstract classes
 - object identity
- ◆ Introduction to JAVA language
 - JAVA as an Object Oriented language
 - HotJAVA/browsers overview
 - JAVA code
- ◆ JAVA constructs and Exceptions: statements, identifiers, literals, variables, declarations, assignments, arrays, operators, flow controls, exceptions, and exception handling.
- ◆ Building and Customizing JAVA Applets
 - applet class and method
 - applet tag/accessing parameter through HTML
- ◆ JAVA Tools
 - JAVA Compiler (JAVAC)
 - applet viewer
 - JAVA debugger (JDB)
- ◆ JAVA Classes
 - JAVA. lang package.
 - classes: method, character, numeric wrappers, Boolean, string, vectors.
- ◆ JAVA Graphical User Interfaces
 - buttons, text fields, and panels
 - labels, lists, and scrollbars
- ◆ JAVA Networking
 - threads
 - I/O streams and file I/O
 - sockets

6.2 EEN 4xx:

Title: Object Oriented Windows

Course Description

Introduction to message driven windows. Windows programming techniques and components including resource, device context, controls, and serializable objects. Document/view objects architecture, multitasking and object sharing.

Prerequisite: Knowledge of C/C++

Text: J. Prosise, "Programming Windows with MFC," Microsoft Press, 1996.

Instructor: Professor Philip S. Liu

Topics

- ◆ Message driven programming
- ◆ Message map
- ◆ Microsoft foundation classes and objects
- ◆ Device context objects
- ◆ Resources objects
- ◆ Controls objects
- ◆ Advanced controls implementation
- ◆ Modal and modeless dialog controls
- ◆ Property sheets
- ◆ Document/view architecture
- ◆ Single document interface
- ◆ Multiple documents and multiple views
- ◆ Pallets and region classes
- ◆ Multitasking and object sharing
- ◆ Serialization

6.3 EEN 5xx

Title: Agents Technology

Course Description

Agent definition and applications, agent modeling and theories, agent representation (KIF), agent behavior, ethical and emotional agents, agent communication languages (KQML), agent development environments and tools, agent systems (Cooperative agents, Interface agents, Information agents, learning agents, believable agents, agents for workgroups, mobile agents), and agent case studies.

Prerequisite: EEN 537 or MTH 545

Textbook: TBA

Course Coordinator: Professor Mansur R. Kabuka

Topics

- ◆ Introduction to intelligent agents
 - Intelligent agent definition
 - Intelligent agent applications (news agents, internet agents, operating system agents, workflow systems)
- ◆ Agent Theories
 - Actor Theory/Subsumption Architecture/ Meta Language Formalism/ Possible world semantics/ speech act theory.
 - Agent models: Intention, belief, and desire
 - Modeling multi-agent systems
 - Agent representation: KIF (Knowledge Interchange Format)
 - Communication modeling
- ◆ Agent behavior
 - veracity, autonomy, commitment
 - ethical agents (safety, tidiness, thrift, vigilance), emotional agents, and negotiation
- ◆ Agent languages
 - object oriented languages: JOULE, CORBA
 - agent oriented languages: KQML (Knowledge Query and Manipulation Language), AGENT-0
- ◆ Agent development environments and tools
 - programming tools (agent building shell)
 - end-user design and programming (KidsSIM)
 - frameworks (APRIL, DESIRE)
- ◆ Agent systems
 - cooperative agents, interface agents, and information agents,
 - learning agents, and believable agents
 - agents for workgroups and mobile agents
- ◆ Case Studies
 - OS agents
 - internet robots, spiders and wanderers
 - SoftBots and KnowBots
 - workflow and news agents

6.4 EEN 5xx

Title: Distributed Systems and Object Oriented Database Management

Course Description

Object-Oriented modeling concepts in languages and database systems. Object Oriented database systems. Semantic data models, nested-relational object-relational databases. Distributed database system. Federated Databases. Application to engineering design problems.

Prerequisite: EEN 523 or MTH 523.

Text Book: Ozsu and P.Valduriez. "Principles of distributed database systems," Prentice-Hall, 1991.

Instructor: New faculty member

Topics

- ◆ Object-Oriented modeling concepts
 - classes, methods and messages
 - inheritance
 - dynamic binding and polymorphism
 - abstract classes
 - object identity
- ◆ Object-Oriented Databases
 - persistence
 - collections
 - class extents
 - data retrieval
- ◆ Other advanced database models
 - nested-relational model
 - semantic data models
 - object-relational databases
- ◆ Distributed database systems
 - architecture of distributed Database Management Systems
 - distributed database design
 - query processing
 - transaction management
- ◆ Federated and multidatabases
- ◆ Engineering applications

6.5 EEN 5xx

Title: Network Computing: The New Enterprise

Course Description

Enterprise's Internet and Intranet architecture: scalability, language independence, and high availability. High performance computing: clustering and performance analysis. Integration through standards: object management model, reference object model, and IDL language. Directory services, Security: symmetric and public cryptography.

Prerequisite: Permission of instructor

Reference Book: Siegel, "CORBA: Fundamentals and Programming," Wiley 1996.

Course Coordinator: Professor Mansur R. Kabuka

Topics

- ◆ Enterprise Internet/Intranet Architecture
 - scalability, integration, and language independence
 - location transparency, distributed concurrency control, and distributed administration
 - cost-effective computing power
 - reliability, availability and serviceability
 - fault tolerance, and high availability
 - security and directory services
- ◆ High Performance computing
 - clustering
 - scalability and performance analysis
- ◆ Integration through standards (CORBA)
 - Object Management Architecture
 - Reference Object Model
 - IDL Language
 - Frameworks
 - Object Services
 - Common Facilities
 - Business Objects
- ◆ Directory services
 - X.500 standards for directory services
- ◆ Security
 - symmetric key cryptography
 - public key cryptography
 - certificates and certification authorities
 - security standards

6.6 EEN 5xx

Title: Interactive Multimedia Computing

Course Description

Interactive multimedia technologies include hardware, software, standards, concepts and issues. Compression, Decompression, user interface design, query by content, multimedia indexing, and distributed multimedia.

Prerequisite: Permission of Instructor.

Text Book: P.K. Andleigh and K. Thakar, "Multimedia System Design," Prentice Hall, 1995.

Course Coordinator: Professor Mansur R. Kabuka

Topics

- ◆ Introduction to multimedia and multimedia tools
 - multimedia data types
 - I/O and storage Devices
 - multimedia applications (Video on demand, video conferencing, interactive TV, home shopping, remote home care, distance learning, digital libraries)
- ◆ Compression and decompression
 - quality of service requirements for transport
 - lossy vs. Lossless compression
 - standards: JPEG, MPEG, MPEG2, AVI, Quick Time, and H320.
- ◆ User Interface Design
 - human factor issues
 - interactive multimedia authoring systems
 - hypermedia design
 - compound documents
- ◆ Querying and content-based retrieval of multimedia
 - extracting features: manual vs. Automatic
 - iconic indexing and visual queries
 - similarity search (nearest neighbor, spatial similarity)
 - evaluating query response: recall and precision
 - user relevance feedback
- ◆ Indexing Multimedia objects
 - single Key index structures
 - multi-attribute and spatial indexing
 - indexing for content retrieval (inverted lists, signature files)
- ◆ Distributed multimedia
 - requirements for interactive multimedia networking
 - network architecture and protocols to support continuous media
 - distributed services (RPC, names servers)

Projects: Through projects students will learn how to capture, represent, store, compress, manipulate, interact with, and present text, drawings, still images, animations, audio and video.

6.7 EE 5xx

Network Service-Client Programming

Course Description

Introduction to server-client systems. Internet server-client communication programming. Advanced server-client design and implementation based on distributed component object model in Windows and Unix.

Prerequisite: Knowledge of C++

Textbooks:

1. G. Gromer, "Server-Client Programming and Applications," Prentice Hall, 1996.
2. D. Kruglinoki, "Inside Distributed Component Object Model," Microsoft Press, 1997.

Instructor: Professor Philip S. Liu

Topics

- ◆ Transport Control Protocol/Internet Protocol (TCP/IP)
- ◆ Windows blocking and non-blocking sockets
- ◆ Simple server-client applications
- ◆ Dual channel/function server/client, FTP server/client
- ◆ Remote procedure calls (RPC)
- ◆ Distributed component object model (DCOM) for sever-client applications
- ◆ DCOM based Active X documents and components
- ◆ Active X automation and controls
- ◆ Active servers and clients
- ◆ Server-side open database connectivity
- ◆ Common gateway interface and scripting

6.8 EEN 5xx

Title: Speech and Audio Processing

Course Description

Introduction to human speech production, hearing and perception, speech and audio signal analysis in time and frequency, speech and audio coding, speech synthesis and recognition, speaker recognition, language modeling and human-machine spoken interaction.

Prerequisite: EEN 436 or permission of instructor.

Textbook: TBA.

Instructor: Dr. Michael Scordilis, Associate Professor.

Topics

- ◆ Man-machine communication: a strategic, interdisciplinary research and development area.
- ◆ Human speech production.
 - structure of the speech production system
 - articulatory and acoustic phonetics
 - acoustic theory of speech production
 - coarticulation and prosody
- ◆ Hearing and perception
 - anatomy and physiology of the ear
 - sound perception
 - temporal and frequency masking
 - vowel and consonant perception, and intonation
- ◆ Speech and audio signal analysis
 - short-time analysis
 - frequency domain analysis
 - pitch extraction
 - feature extraction
 - signal processing and reconstruction
 - signal enhancement and noise suppression
- ◆ Speech and audio coding
 - A/D conversion and quantization
 - PCM, ADPCM, Linear predictive coding, Vocoder, Vector quantization
 - G.721, G.728, MPEG, APC and Dolby coders, DAB
- ◆ Speech synthesis
 - articulatory, time and frequency domain synthesis techniques
 - Unrestricted text-to-speech synthesis

Projects:

Students will be offered the opportunity to implement real speech and audio processing applications through projects focusing on any of the areas covered in this course.

BIOGRAPHICAL SKETCH

Name: **Dr. Mansur R. Kabuka** Position Title: **Professor and Director
Professor of Computer Engineering & Radiology**

Institution	Degree	Field of Study
Univ. of Virginia, Charlottesville	Ph.D.	Computer Engineering
University of Miami, Florida	M.S.	Computer Engineering
University of Alexandria	B.S.	Computer Science

EXPERIENCE

Dr. Mansur R. Kabuka has over fifteen years of experience in information technology, seven years in medical information systems, and extensive experience in real-time computing and high speed networking. Dr. Kabuka was an active member of the Florida High Technology and Industry Council: The Computer Integrated Engineering. He reviewed numerous large scale interdisciplinary projects and centers. Dr. Kabuka is the founder and director of the Medical Imaging and Medical Informatics Center. He initiated and played a principal role in establishing M.S. Medical Informatics program at UM, School of Medicine, the off-campus M.S. in Computer Science at IBM, Boca Raton, FL, (with Math and Computer Science Dept.), and the M.S. in Industrial Electronics & Computers at McDonnell Douglas (Titusville, FL). Dr. Kabuka received several grants and obtained donations from several companies valued at three million dollars.

Some of the Information Technology Projects Recently Successfully Completed:

1. **Design, Implementation and Deployment of a Mission Critical High Performance Enterprise: Distributed High Speed Network and Interactive Media for Medical Applications**
2. **Digital Radiology Infrastructure (DRI)**
3. **Integrated Registration Facility (IRF)**
4. **Global Patient Registration System (GPRS)**
5. **Multimedia Diagnosis Workstation (MDW)**
6. **Clinician Workstation (CW)**
7. **Cooperative Medicine Workstation (CMW)**
8. **Automatic Data Entry (ADE)**
9. **Cardiology Workstation**

PUBLICATIONS

SELECTED PAPERS (1993-1996)

1. Kabuka, M.R. (with E. El-Kwae), "A Robust Frame Work for Content-Based Retrieval by Spatial Similarity in Image Databases," ACM Trans. on Information Systems, In press.
2. Kabuka, M.R. (with W. Li), "New Volume Rendering Model Using Weighted Compositing," IEEE Trans. on Medical Imaging, In press.
3. Kabuka, M.R. (with S. Bhide and N. John), "A Boolean Neural Network Approach for the TSP," IEEE Trans. on Computer, Vol. 42, number 10, pp 1271-1278, 1993.
4. Kabuka, M.R. (with Basit Hussain), "A Novel Feature Recognition Neural Network," IEEE Trans. on Pattern Analysis and Machine Intelligence, vol. 16, number 1, pp. 98-106, 1994.
5. Kabuka, M.R. (with Andres Rios), "Image Compression with a Dynamic Autoassociative Neural Network," Journal of Mathematical and Computer Modelling (Invited), 1994.
6. Kabuka, M.R. (with S. Gazula), "Real-Time Supervised Classifiers using Boolean Neural Networks," IEEE Trans. on Pattern Analysis and Machine Intelligence, vol 17, no. 12, Dec. 1995.

7. Kabuka, M.R. (with A. Rios), "A High Performance Neural Network-based Compression System for MR Images," the Society of Magnetic Resonance in Medicine 12th Annual Meeting, 1993.
8. Kabuka, M.R. (with A. Younis), "Adaptive Classification and Compression of MR Images using Neural Network Architecture," the Soc. of Magnetic Resonance in Medicine 12th Meeting, 1993.
9. Kabuka, M.R. (with Gregory M. Shebert), "An Improvement to the Neural Network Compression of Medical Image Data," IEEE Data Compression Conference, March 1993.
10. Kabuka, M.R. (with Markus Gudmundsson), "An Integrated Patient Oriented Workstation for Radiological Diagnosis," IEEE Engineering in Medicine and Biology Conference, 1993.
11. Kabuka, M.R. (with D. Xu), "Image Analysis of 3-D Micromotion of Porous-Coated Femoral Prostheses," IEEE Computer-based Medical Systems Symposium, 1993.
12. Kabuka, M.R. (with S. Bhattacharjee), "Face Image Analysis for the Study of Human Emotions," IEEE Engineering in Medicine and Biology Conference, 1993.
13. Kabuka, M.R. (with S. Bhide, S. Gazula and G. Shebert), "An ASIC Implementation of a User Configurable Boolean Neural Network Chip," World Congress on Neural Networks, 1993.
14. Kabuka, M.R. (with S. Bhide and N. John), "A Real-time Solution for the TSP using Boolean Neural Network," IEEE Int. Conf. on Neural Networks, 1993.
15. Kabuka (with E. Figueredo), "A Visual Medical Image Processing and Visualization System," SPIE Conference, Medical Imaging, 1994.
16. Kabuka, M.R. (with T. Wan), "Edge-Preserving Image Compression for Magnetic-Resonance Images Using DANN-based Neural Network," SPIE Conference, Medical Imaging, 1994.
17. Kabuka, M.R. (with A. Rios), "Neural Network Compression for Medical Images: Dynamic Autoassociative Neural Network (DANN) Codec," SPIE Conference Medical Imaging, 1994.
18. Kabuka, M.R. (with N. John, X. Li, A. Younis), "Towards Automatic Segmentation of MR Brain Images," SPIE Conference, Medical Imaging, 1994.
19. Kabuka, M.R. (with W. Sull), "Paradigm for Having a Logical Data Integration Between PACS and HIS," SPIE Conference, Medical Imaging, 1994.
20. Kabuka, M.R. (with S. Banerjee), "ATM-based Fiber Optic Network for Scalable and Modular PACS Design," SPIE Conference, Medical Imaging, 1994.
21. Kabuka, M.R. (with Maria J. Bianchi), "An Algorithm for Detection of Masses, Microcalcification and Skin Contours in Mammograms," Symposium for Computer Assisted Radiology, 1994.
22. Kabuka, M.R. (with X. Li and S. Bhide), "Labelling of MR Brain Images using a Boolean Neural Network," Symposium for Computer Assisted Radiology, 1994.
23. Kabuka, M.R. (with X. Li and N. John), "A Statistical Approach to the Segmentation of MR Brain Images," The Society of Magnetic Resonance Meeting, San Francisco, 1994.
24. Kabuka, M.R. (with S.M. Bhide), "Image Segmentation with Boolean Neural Networks for Medical Imaging," The Society of Magnetic Resonance Meeting, San Francisco, 1994.
25. Kabuka, M.R. (with F. Sauer), "Multimedia Technology in Radiology Department," ACM Multimedia 94, San Francisco, 1994.
26. Kabuka, M.R. (with S. Bhide, N. Borko, N. John, F. Sauer, W. Sull, S. Waly, and A. Younis), "Integration of Medical Information Systems using Object-Oriented Technology," OOPSLA'94 Workshop on Object-Oriented Technology for Health Care and Medical Information Systems, Portland, 1994.
27. Kabuka, M.R. (with S. Bhide, N. Borko, N. John, F. Sauer, W. Sull, S. Waly, and A. Younis), "Applying Object Oriented Technology in the Integration of Legacy Databases," Eleventh International Symposium on the Creation of Electronic Health Record Systems and Global Conference on Patient Cards, Orlando, Florida, 1995.
28. Kabuka, M.R. (with F. Sauer, S. Waly), "Automatic Data Entry Using Scanning and Color Segmentation of Driving Licenses", Eleventh International Symposium on the Creation of Electronic Health Record Systems and Global Conference on Patient Cards, Orlando, Florida, 1995.
29. Kabuka, M.R. (with X. Li), "Labeling of MR Brain Images Using a Boolean Neural Network," IEEE Trans. on Medical Imaging, in press.
30. Kabuka, M.R. (with E. El-Kwae and Maria Bianchi), "Detection of Malignant Regions in 3D MRI Breast Images using a Boolean Neural Network," SCAR 96 Symposium for Computer Assisted Radiology, June 6-9, 1996, Denver, Colorado.

31. Kabuka, M.R. (with E. El-Kwae), "An Autonomous Boolean Neural Network System for Image Understanding," ANNIE Conference, St. Louis, MO, 1996.
32. Kabuka, M.R. (with K. Abdalla), "Functional Integration Technique for CORBA-Based Interoperable Information Systems," submitted to Sixth Int. Conference on Information and Knowledge Management, Nov. 1997.

BIOGRAPHICAL SKETCH

NAME: TZAY Y. YOUNG
POSITION: Professor and Chairman
Department of Electrical & Computer Engineering

EDUCATION:

B.S.E.E., National Taiwan University
M.S.E.E., University of Vermont
Dr. Eng., Johns Hopkins University

PROFESSIONAL ACTIVITIES:

Fellow, IEEE, American Men and Women of Science, Who's Who in America. Sigma Xi, Eta Kappa Nu
Member of Editorial Committee, IEEE Trans. on Pattern Analysis and Machine Intelligence, 1979-1984.
Member of Advisory Board, IEEE Trans. on Pattern Analysis and Machine Intelligence, 1984-1990.
Associate Editor for Pattern Recognition and Artificial Intelligence, IEEE Trans. on Computers, 1974-1976.
Member, Technical Committee on Machine Pattern Analysis, IEEE Computer Society, 1974-present.
Chairman, Technical Programs, IEEE Global Communications Conference, Dec. 1982.
General Chairman, IEEE Computer Society Workshop on Computer Architecture for Pattern Analysis and
Image Database Management, Nov. 1985.
Co-Chairman, Technical Program, IEEE Southeastcon, April 1994.

EXPERIENCE:

University of Miami, Department of Electrical and Computer Engineering,
Professor, 1974-present. Acting Chairman, 1988-1991; Chairman, 1991-present.
Carnegie-Mellon University, Department of Electrical Engineering,
Assistant Professor, 1964-1968; Associate Professor, 1968-1974.
N.A.S.A. Goddard Space Flight Center, Communications and Navigation Division,
Senior Research Associate, 1972-1973 (on sabbatical leave).
Bell Laboratories, Murray Hill, N.J. Member of Technical Staff, 1963-1964,
Johns Hopkins University, Caryle-Barton Laboratory, Research Associate, 1962-1963.

FUNDED RESEARCH:

NSF Grants for three-dimensional motion analysis from images; three-dimensional shape
recovery from a single view; multilinear approach to data file compression; stochastic
approximation algorithms for pattern recognition and signal processing; resolution and
extraction of overlapping signals.
NASA Grant for optimum signal processing for meteorological radar.
NIH Grant (Co-PI) for neural system modeling.
FHTIC Grants for computer software for dynamic scene analysis; neural network algorithms
for computer vision and automation.
Industrial Grants for subpixel edge detection with a line scan camera; computer simulation of
power line carrier system; applying image processing techniques for cleft-palate images.

PUBLICATIONS:

BOOKS

T.Y. Young and T.W. Calvert, Classification, Estimation and Pattern Recognition, Elsevier,
New York, 1974.

T.Y. Young and K.S. Fu, Eds., Handbook of Pattern Recognition and Image Processing, Academic Press, Orlando, 1986.

T.Y. Young, Ed., Handbook of Pattern Recognition and Image Processing, vol. 2: Computer Vision, Academic Press, San Diego, 1994.

SELECTED JOURNAL ARTICLES AND BOOK CHAPTERS:

1. Y. Ding and T.Y. Young, "Complete Shape from Imperfect Contour: A Rule Based Approach", Computer Vision and Image Understanding, to appear., 1997
2. S.R. Yhann and T.Y. Young, "Boundary Localization and Texture Segmentation", IEEE Trans. on Image Processing, vol. 4, pp 849-856, 1995.
3. W.J. Shomar and T.Y. Young, "Three-Dimensional Shape Recovery from Line Drawings", in Handbook of Pattern Recognition and Image Processing, vol. 2: Computer Vision, T. Y. Young, Ed., Academic Press, pp. 53-100, 1994.
4. W. Zhao, T.Y. Young and M.D. Ginsberg, "Registration and Three-Dimensional Reconstruction of Autoradiographic Images by the Disparity Analysis Method", IEEE Trans. on Medical Imaging, vol. 12, pp. 782-791, 1993.
5. W.J. Shomar, G. Seetharaman and T.Y. Young, "An Expert System for Recovering 3D Shape and Orientation from a Single View", Computer Vision and Image Processing, L.G. Shapiro and A.R. Rosenfeld, Eds., pp. 459-515, Academic Press, 1992.
6. G.J. Salem and T.Y. Young, "A Neural Network Approach to the Labeling of Line Drawings", IEEE Trans. on Computers, vol. C-40, pp. 1419-1424, 1991.
7. M. Cohn, M. Trefler and T.Y. Young, "Enhancement and Compression of Digital Chest X-Rays", Journal of Thoracic Imaging, vol. 5, pp. 92-95, 1990.
8. W.-Z. Zhao, F.-H Qi and T.Y. Young, "Dynamic Estimation of Optical Flow Using Objective Functions", Image and Vision Computing, vol. 7, pp. 259-267, 1989.
9. Y.-S. Li, T.Y. Young and C. -C. Huang, "Noncontact Measurement Using Line Scan Cameras: Analysis of Positioning Error", IEEE Trans. on Industrial Electronics, vol. IE-36, pp. 545-551, 1989.
10. T.Y. Young, S. Gunasekaran and W.-Z. Zhao, "Analysis and Extraction of Three Dimensional Motion Information from an Image Sequence", Advances in Artificial Intelligence Research, vol. 1, M.B. Fishman, Ed., JAI Press, Greenwich, Conn., pp. 209-223, 1989.
11. E.T. Lee, T.Y. Young, T.K. Ho and W.J. Shomar, "Pictorial Knowledge and Its Application to Space Object Surveillance", Advances in Artificial Intelligence Research, vol. 1, M.B. Fishman, Ed., JAI Press, Greenwich, Conn., pp. 309-345, 1989.
12. S. Gunasekaran and T.Y. Young, "A Region Correspondence Approach to the Recovery of 3D Motion and Structure in Dynamic Scenes", in Image Understanding in Unstructured Environment, S. Chen, Ed., World Scientific Series, pp. 75-123, 1989.
13. H.H. Liu, T.Y. Young and A. Das, "A Multilevel Parallel Processing Approach to Scene Labelling Problems", IEEE Trans. on Pattern Analysis and Machine Intelligence, vol. PAMI-10, pp. 586-590, 1988.
14. T.Y. Young, Y.S. Li and J.A. Magerl, "Noncontact Measurement Using Line Scan Cameras with Subpixel Accuracy", Iron and Steel Engineer, vol. 65, no. 6, pp. 40-46, 1988.
15. Y.S. Li, T.Y. Young, and J.A. Magerl, "Subpixel Edge Detection and Estimation with a Microprocessor-Controlled Line Scan Camera", IEEE Trans. on Industrial Electronics, vol. IE-35, pp. 105-112, 1988.
16. T Y Young and S. Gunasekaran, "A Regional Approach to Tracking 3D Motion in an Image Sequence", in Advances in Computer Vision and Image Processing, vol. 3, T.S. Huang, Ed., JAI Press, Greenwich, Conn., pp. 63-99, 1988.
17. R.N. Nelson and T.Y. Young, "Determining Three-Dimensional Object Shape and Orientation from a Single Perspective View", Optical Engineering (Special issue on Applications of Artificial Intelligence), vol. 25, pp. 394-401, 1986.
18. T.Y. Young and P.S. Liu, "VLSI Array Architecture for Pattern Analysis and Image Processing", in Handbook of Pattern Recognition and Image Processing, T.Y. Young and K.S. Fu, Editors, pp. 471-495, Academic Press, Orlando, 1986.
19. T.Y. Young, P.S. Liu and H.H. Liu, "Applications of VLSI to Pattern Recognition and Image Processing", in VLSI Handbook, N.G. Einspruch, Ed., pp. 785-799, Academic Press, Orlando, 1985.

BIOGRAPHICAL SKETCH

NAME: Christos Douligeris

POSITION: Associate Professor

EDUCATION:

Columbia University, M.S. 1985, M. Phil. 1987, Ph.D. 1989
National Technical University of Athens, Greece
Dept. of Electrical Engineering, Diploma in E.E., July 1984

EXPERIENCE:

1989-present Dept. of Electrical & Computer Engineering, Univ. of Miami,
Associate Professor
1994-present Ocean Pollution Research Ctr, Assoc. Director for Engineering
May-June '90 INRS Telecommunications, Univ. of Quebec, Visiting Scientist
1984-1989 Columbia University, Research Assistant

PROFESSIONAL ACTIVITIES

IEEE Communications Society (Member since 1989)
IEEE Communications Society, Computer Communications Tech. Committee
(Member since 1989)
ORSA, Special Interest Group on Telecommunications (Assoc. Member since
1989)
ACM, Special Interest Group on Computer Communications, (Assoc. Member
since 1994)
Technical Chamber of Greece (Member since 1984)

FUNDED RESEARCH

"Analysis of Contingency Plans in the Gulf of Mexico", NOAA Seagrant 1996-97
(\$187,000), P.I.
"Ocean Status Information Management System", NOAA, 1995-96 (\$70,000), P.I.
"Human Factors in Oil Spill Incidents", Dept. of Transportation, 1995-96
(\$96,772), P.I. Dr. E. Iakovou.

PUBLICATIONS

BOOKS AND MONOGRAPHS

1. Douligeris, C., "Optimal Flow Control and Fairness in Communications Networks
- A Game Theoretic Perspective", Ph.D. Dissertation, Columbia Univ., 1990,
Univ. Microfilms International, Ann Arbor, MI, 146 pp.

2. Douligeris, C., "Stability Properties of Power Transmission Lines", Diploma Thesis, Nat. Tech. Univ. of Athens, Athens, Greece, 1987.

SELECTED JOURNAL ARTICLES

1. K.G. Zografos, C. Douligeris and P. Tsoumpas, "An Integrated Framework for Managing Emergency Response Operations: The Case of the Electric Utility Companies", IEEE Trans. on Engineering Management, Special Issue on Emergency Management and Eng., 1996 (invited), to appear.
2. L.N. Kumar and C. Douligeris, "Demand and Service Matching at Heavy Loads: A Dynamic Bandwidth Control Mechanism for DQDB MANs", IEEE Trans. on Communications, Vol. 44, No. 11, Nov. 1996, pp. 1485-1495.
3. Y.C. Liu and C. Douligeris, "Rate Regulation with Feedback Controller in ATM Networks - A Neural Network Approach", IEEE JSAC Special Issue on Computational Intelligence for High Speed Networks, February 1997, Vol. 115, No. 2, pp. 200-208.
4. H. Fahmy, G. Develekos, and C. Douligeris, "Application of Neural Networks and Machine Learning in Network Design", IEEE JSAC Special Issue on Computational Intelligence for High Speed Networks, February 1997, Vol. 115, No. 2, pp. 226-237.
5. H. Fahmy and C. Douligeris, "END: An Expert Network Designer", IEEE Network, November/December 1995, Vol. 9, No. 6, pp. 18-27.
6. C. Douligeris and I. Pereira, "A Telecommunications Quality Study Using the Analytic Hierarchy Process, IEEE Journal on Selected Areas on Communications, Special Issue on Quality and Telecommunication Services, Networks and Products, Vol. 12, No. 2, Feb 1994, pp. 241-250.
7. C. Douligeris and R. Mazumdar, "Multilevel Flow Control in Telecommunication Networks", Journal of the Franklin Inst., Vol. 331B, No. 4, 1994, pp. 417-433.
8. C. Douligeris, "Multiobjective Flow Control in Delay Constrained Telecommunication Networks", Journal of the Franklin Inst., Vol. 331B, No. 1, pp. 77-100, Jan. 1994.
9. L.N. Kumar, C. Douligeris and G. Develekos, "Implementation and Performance Analysis of a Decentralised Multiclass Flow Control Algorithm Using Pareto Optimal Criterion", Computer Communications, Vol. 17, No. 8, August 1994, pp. 600-610.
10. C. Douligeris and L.N. Kumar, "Fairness Issues in the Networking Environment: A Survey", Computer Communications, Vol. 18, No. 4, April 1995, pp. 288-299.
11. C. Douligeris and R. Mazumdar, "Efficient Flow Control in a Multiclass Telecommunications Environment", IEE Proc., Part I, Vol. 138, No. 6, December '91.
12. T.C. Wan and C. Douligeris, "Improved Estimator for a Discretized Learning Algorithm", Electronics Letters, Vol. 30, No. 2, 108-110, January 1994.
13. S. Liebesman, C. Douligeris and H. Pham, "Quality Assurance Management", IEEE Comm. Magazine, Special Issue on Quality Assurance Management, Editorial, October 1994, p. 25.

BIOGRAPHICAL SKETCH

NAME: John William Collins

POSITION: Assistant Professor
Department of Electrical and Computer Engineering
University of Miami

EDUCATION:

Ph.D. , & Computer Science, University of Illinois, January, 1994. GPA: 5.0/5.0
M.S. , & Computer Science, University of Illinois, May 1988. GPA: 5.0/5.0
B.S. , & Mechanical Engineering, Rose-Hulman Institute of Technology, May 1979. GPA:
3.6/4.0

EXPERIENCE:

1992--present Assistant Professor, U. of Miami.
1986--1992 Research Assistant, Computer Science, U. of Illinois.
1979--1985 Senior Research Engineer, Applied Research Group,
Motorola Portable Products Division -- Communications Sector, Plantation Florida.

PROFESSIONAL ACTIVITIES

Member, Phi Kappa Phi national honor society
Member, Eta Kappa Nu electrical engineering honor society
Recipient, Cognitive Science/Artificial Intelligence Fellowship, 1988-1989
Research Assistant, University of Illinois Dept. of Computer Science, 1986-1992
Graduated with honors from Rose-Hulman Inst. of Technology, Spring 1979
Recipient, National Merit Commended Student Award, Spring 1975.

FUNDED RESEARCH:

"Ocean Status Information Management System", National Oceanographic and Atmospheric Administration, 1995-1996. (\$70,000 with Dr. Douligeris), Co-Principal Investigator.

"An Adaptive Decision Support System for Oil Spill Countermeasures", United States Coast Guard, 1994-1995, (\$39,079 with Drs C. Douligeris and E. Iakovou) Task Principal Investigator.

"Object-Oriented Database Design for Oil Spill Management System", United States Coast Guard, 1994-1995 (\$42,736, with Dr. A. Thakore), Task Co-Principal Investigator.

"Geographic Information Systems and Advanced Visualization Techniques", United States Coast Guard, 1994-1995 (\$125,237, with Drs C. Douligeris, A. Thakore and B. Baca).

"Asynchronous Transfer Mode (ATM) Switching for Legacy Systems", BellSouth Corporation and General DataComm, 1995-1996. P.I. (\$100,000, approx. \$50,000 of which is equipment).

PUBLICATIONS:

JURIED OR REFEREED JOURNAL ARTICLES:

Douligeris, C., Collins, J., Iakovou, E., Sun, P., Riggs, R., and Mooers, C., "Development of OSIMS: An Oil Spill Information Management System", *Spill Science and Technology Bulletin*, 1996.

REFEREED CONFERENCE PROCEEDINGS:

1. Douligeris, C., Collins, J., Baca, B., Blanco, R. and Jacobs, J., "OSIMS: An Oil Spill Information Management System", 1997 International Oil Spill Conference, Ft. Lauderdale, FL, April 7-10, 1997.
2. Collins, J., Douligeris, C. "An Internet-Based Information Management System for Oil Spill Response." In Proc. of the ECO-INFORMA 96 Conference, Orlando, FL, November, 1996.
3. Douligeris, C., Collins, J., Blanco, R., Jacobs, J. "Experience with a South Florida Oil Spill Information Management System." In Proceedings of the OCEANS 96 MTS/IEEE Conference, Fort Lauderdale, FL, September, 1996.
4. Collins, J., Riggs, R. & Douligeris, C. "Spinning an Expert Information System on the World Wide Web Knowledge Sources", TIEMEC '96.
5. Douligeris, C., Collins, J., Iakovou, E., Sun, P. and Riggs, R. "Designing an Oil Spill Information Management System", The International Emergency Management and Engineering Conference 1995, Nice, France, May 9-12, 1995, pp. 386-391.
6. Collins, J., Xiong, X. and Kabuka, M. "Monitoring and Distributing Processes in a Local Area Network", EURO-PAR'95.
7. Collins, J. and DeCoste, D. "CATMS: An ATMS which avoids Label Explosions." In Proc. of the Ninth National Conference on Artificial Intelligence, Los Angeles, CA, July 1991.
8. Collins, J. and Forbus, K. "Reasoning about Fluids Via Molecular Collections." In Proceedings of the Sixth National Conference on Artificial Intelligence, Seattle, WA, July, 1987. Also appears in D. Weld and J. deKleer, editors, *Readings in Qualitative Reasoning about Physical Systems*, Morgan Kaufman, San Mateo, CA, 1990.
9. Collins, J. "A Neural Network Based on Co-Occurrence Probabilities." In Proceedings of the First IEEE International Conference on Neural Networks, San Diego, CA, June, 1987.

OTHER CONFERENCE ABSTRACTS AND PRESENTATIONS:

1. Douligeris, C. and Collins, J., "Design of Prototype Oil Spill Information Management System", Florida Coastal Ocean Sciences and Technology Symposium 1996 (FCOSTS96), 9-10 April 1996, Harbor Branch Institute, Ft. Pierce FL.
2. Douligeris, C., Collins, J., Iakovou, E., and Mooers, C., "OSIMS: A Prototype Oil Spill Information Management System." Second International Oil Spill Research and Development Forum, London, May 23-26, 1995, pp. 774-781.
3. Douligeris, C., Collins, J., Iakovou, E., Sun, P. and Riggs, R., "Designing an Oil Spill Information Management System." The International Emergency Management and Engineering Conference 1995, Nice, France, May 9-12, 1995, pp. 386-391.

TECHNICAL REPORTS:

1. Collins, J. "Process-Based Diagnosis: An Approach to Understanding Novel Failures." PhD thesis, University of Illinois at Urbana-Champaign, January 1994. (Technical Report UIUCDCS-R-94-1846.)

BIOGRAPHICAL SKETCH

NAME: Philip S. Liu

POSITION: Professor

EDUCATION:

Ph.D. (Computer Engineering), Purdue University, 1975
M.S.E.E. (Electrical Engineering), Purdue University, 1972
B.S.E.E. (Electrical Engineering), University of Wisconsin, 1970

EXPERIENCE:

Professor, University of Miami, Dept. of Electrical & Computer Engineering.
Twenty two years. Original appointment August 1975.
MTS, Advanced Technology Group, Bell Laboratories, 1982-83.

PROFESSIONAL ACTIVITIES

IEEE Computer Society
The Institute of Electrical and Electronics Engineers Inc., Senior Member
Association of Computing Machinery
Eta Kappa Nu

FUNDED RESEARCH:

NSF VLSI design fabrication award, 517-NSF-ACLAS/UMIAMI-ENGR.
NSF supercomputer research grant for undergraduate program
Sun Microsystem research equipment grant,
Computing grant
NSF grant "Advanced Digital Design Laboratory"
NSF grant, "Database Compression".

PUBLICATIONS:

1. P.S. Liu and L. Martinez, "Partitioned Schemes of Mapping Neural Networks onto Mesh-Connected Computers", Proc. of IEEE South-East Conference, April 1994.
2. P.S. Liu, "Problem Size Independent Processor Array", Int. Journal on Micro and Minicomputers, Vol. 1, pp. 86-89, Jan. 1990.
3. P.S. Liu and J. Data, "A Pipeline Approach to Problem Size Independent (VLSI) Processor Arrays", Int. Journal on Micro and Minicomputers, pp. 86-89, 1990.
4. B. Furht and P.S. Liu, "Interfacing and Communication Experiments", IEEE Trans. on Education, pp. 124-128, April 1989.

5. P.S. Liu, "Problem Size Independent VLSI Processor Array", Proc. Int. Conference on Mini and Microcomputers, pp. 147-150, Dec. 1988.
6. P.S. Liu, "Optimal and Broadcasting VLSI Processor Arrays", Proc. 1987 Miami Int. Technicon, pp. 212-216, Oct. 1987.
7. T.Y. Young and P.S. Liu, "VLSI Architecture for Pattern Recognition and Image Processing", in Pattern Recognition and Image Processing Handbook, Academic Press, pp. 471-496, 1986.
8. T.Y. Young, P.S. Liu and H.H. Liu, "Applications of VLSI to Pattern Recognition and Image Processing", VLSI Handbook, edited by N.G. Einspruch, Academic Press, pp. 785-799, 1985.
9. P.S. Liu, "Problem Size Independent VLSI Processor Array", Proc. Int. Conference on Mini and Microcomputers, pp. 147-150, Dec. 1988.
10. P.S. Liu, "Optimal and Broadcasting VLSI Processor Arrays", Proc. 1987 Miami Int. Technicon, pp. 212-216, Oct. 1987 (leadoff paper in computer engineering).
11. P.S. Liu, "Pipelined Data Broadcasting in VLSI Processor Array Design", submitted to IEEE Transactions on Computers.
12. T.Y. Young and P.S. Liu, "VLSI Architecture for Pattern Recognition and Image Processing", in Pattern Recognition and Image Processing Handbook, Academic Press, pp. 471-496, 1986.
13. T.Y. Young, P.S. Liu and H.H. Liu, "Applications of VLSI to Pattern Recognition and Image Processing", VLSI Handbook, edited by N.G. Einspruch, Academic Press, pp. 785-799, 1985.
14. T.Y. Young and P.S. Liu, "VLSI Arrays for Pattern Recognition and Image Processing: I/O Bandwidth Considerations", VLSI for Pattern Recognition and Image Processing, edited by K.S. Fu, Springer-Verlag, New York, pp. 25-42, 1984.
15. P.S. Liu and T.Y. Young, "VLSI Array Design under Constraints of Limited I/O Bandwidth", IEEE Trans. on Computers, pp. 1160-1170, Dec. 1983.
16. P.S. Liu and T.Y. Young, "VLSI Array Architecture for Picture Processing", Picture Engineering, K.S. Fu and T.L. Kunil, Eds., Springer-Verlag, pp. 171-186, 1982.
17. P.S. Liu, "An Approach to Automatic Generation of Globally Area-Time Efficient VLSI Processor Array Design", Proc. Automation 86, pp. 101-105, March 1986 (plenary session).

Bibliographical Sketch

Name: Saeed A. Rajput

Position: Sr. Research Associate

Education

- Ph.D. Univ. of Southern California, (USC) May 1992. Communications Sciences Institute.
- M.S. Univ. of Southern California, May 1990. Communications Sciences Institute.
- M.S. Philips International Institute (PII), Eindhoven, The Netherlands, 1987, (Distinction).
- B.Sc. Engineering with Honors, Univ. of Engineering and Tech. Lahore, 1985. (Third Position).

Teaching Experience

- Apr. 1996: University of Miami: Graduate Course in Medical Informatics.
- Aug. 1993- Apr. 1995: National University of Sciences and Technology, Islamabad (Affiliated with Michigan State University), Associate Professor
- Jul. 1993 - Jan. 1994: Quaid-e-Azam University, Islamabad, Visiting Associate Professor
- 1993 University of Engineering and Technology, Lahore, Visiting Associate Professor
- Aug. 1992- Aug. 1993: Ghulam Ishaq Khan Institute, Pakistan, Academic Advisor
- Jan. 1991 - May 1992: West Coast University, Los Angeles, Visiting Instructor
- Jan. 1991- Dec. 1992 University of Southern California, Los Angeles, Teaching Assistant

Research, Development, and Industrial Experience

- Jan. 1996 - Present: Senior Research Associate at University of Miami, Department of Radiology, Center for Medical Imaging and Medical Informatics
Object oriented analysis, design and development of healthcare software systems, *integration of healthcare computer networks* that carry multimedia information. Implementation of healthcare computer networks.
- Apr. 1995- Jan. 1996: Senior Software Engineer at Time Warner Communications
Performing *Object Oriented Analysis*, guiding object oriented design and leading software development teams for development of various Telecommunication software packages including circuit design application for the engineering department design and work flow management applications for SONET networks and 5ESS switches. Developing project management methodology for a highly dynamic and changing environment. Projects included circuit design and work flow management applications for Telecommunication networks and switches.
- Sep. 1993- Dec. 1994: Project Leader for Telecom Foundation
Design and Implementation of Telecommunication Equipment based on software and hardware for switching for connecting PVCs.
- Jul. 1993- Apr. 1995: Project Leader at Central Telecommunication Research Laboratories
Analysis, design, and implementation of a automatic fault analysis and reporting systems for telephone exchanges. System included a queuing system, a reporting database and a computer network based on LAN and WAN.
- Jul. 1992- Aug. 1994: Development on Contract for National University of Science and Technology
- Jun. 1989- May92: Research Assistant at Communications Sciences Institute, University of Southern California, Los Angeles
- May 1986 - Aug. 1986 and Dec. 1986 - Jul. 1987: Research Assistant at Philips Research Laboratory
- Feb. 1985 Jan. 1986: Contract Engineer at Central Telecommunications Research Laboratories

Professional Activities

Member IEEE.

Publications

1. "A Co-designed Coding, Modulation and Equalization Scheme for the Transmission of 155.52 Mbit/s Data over a 72 MHz IntelSat Transponder. Part 2: Equalization," International Journal of Satellite Communications, Vol. 11, No. 6, Nov.-Dec. 1993, pp. 335-365.
2. "A Co-designed Decision Feedback Equalizer Deinterleaver and Decoder," Proceedings, Globecom'91, Arizona, 1991, pp. 1165-1169.
3. "Co-designed Decision Feedback Equalizer Deinterleaver and Decoder," Ph.D. Dissertation, Univ. of Southern California, April 1992.
4. "On Use of Feedback for Simplifying Viterbi Detector," Philips J. of Research, 1988. Vol. 42.

BIOGRAPHICAL SKETCH

NAME: MICHAEL S. SCORDILIS

POSITION: ASSOCIATE PROFESSOR

EDUCATION: Ph.D. in Electrical Engineering (1990), Clemson University, Clemson, SC, USA.
M.S. in Electrical Engineering (1986), Clemson University, Clemson, SC, USA.
B.E. in Communications Engineering (1984), Royal Melbourne Institute of Technology, Melbourne, Australia.

EXPERIENCE

- Since 1/1997: Associate Professor, Department of Electrical and Computer Engineering, University of Miami.
- 12/1995-1/1997: Senior Researcher, The European Union DIALOGOS, and ACCESS Projects (Man-Machine Speech Dialogues), Wire Communications Laboratory, Department of Electrical and Computer Engineering, The University of Patras, Rion, Greece.
- 4/1996-1/1997: Senior Engineer, Language Engineering Research, KNOWLEDGE, S.A. Patras, Greece.
- 9/1990-11/1995: University Lecturer (Level B - Confirmed), Department of Electrical and Electronic Engineering, The University of Melbourne, Melbourne, Australia.
- 3/1994-7/1994: Visiting Senior Scientist, Sun Microsystems Laboratories, Speech Recognition Group, Chelmsford, MA, USA.
- 1/1994-3/1994: Visiting Senior Scientist, Bell Communications Research (Bellcore), Speech Analysis and Synthesis Group, Morristown, N.J., USA.
- 1988-: Project Consultant and Software Developer, For several private companies and public institutions in Melbourne, Australia and in the United States.
- 1984-1990: Research Fellow and Teaching Assistant, Department of Electrical and Computer Engineering, Clemson, S.C., USA.
- 1982-1984: Technical Officer, (Production and Testing of the AXE and ASB900 Digital Telephone Exchanges), L. M. Ericsson, Melbourne, Australia.
- 11/80-2/81: Computer Hardware Developer, Compuserve, Newcastle, Australia.

PROFESSIONAL ACTIVITIES

PROFESSIONAL CONSULTING

- 1992-97: Text-to-Speech synthesis (Bellcore USA & Robotron, Melbourne, Australia), Speech Recognition (Sun Microsystems, USA & Collaborative Information Technology Research Institute, CITRI, Melbourne, Australia), DSP and Audio (Analog Devices, Norwood, Massachusetts, USA, and Melbourne, Australia), Modem design and Audio processing (EDL, Melbourne, Australia), Acoustics (Australian National Acoustic Laboratories)

FUNDED RESEARCH

- 1997-98: "WWW-based Interactive Instruction to Digital Signal Processing", University of Miami
- 1996-: "Development of Masters Degree programme in Speech Communication Sciences", European Programme SOCRATES/ERASMUS Thematic Network
- 1995-97: "Electronic monitoring of fishways", Murray-Darling Basin, NSW Fisheries Research Institute
- 1994: "The potential for a non-intrusive, non-destructive instrument for monitoring fish behaviour", Land and Water Resources Research and Development Corporation

1991-1993: "Children's Perception and Production of Speech", Australian Research Council (A.R.C.)
1991-1992: "Speech Compression with Artificial Neural Networks"
1990-1991: "Speech Synthesis using Artificial Neural Networks", A.R.C.

REPRESENTATIVE PUBLICATIONS

Scordilis, M.S., "A Neural Network Cluster for the Control of a Speech Synthesizer", in Tzafestas, S.G. (ed.), *Engineering Systems with Intelligence: Concepts, Tools and Applications*, Kluwer Academic Publishers 1991, pp. 229-235.

Scordilis, M.S., "Current Speech Technology and the Need for Robust Processing", *Australian Speech Science and Technology Association Bulletin*, No. 12, September 1995, pp. 3-4.

Scordilis, M.S., Gowdy, J. N., "A Neural Network-based Control Strategy for a Speech Formant Synthesizer", *Journal of Artificial Neural Networks*, Vol. 2, No. 3, 1995, pp. 195-103.

Scordilis, M.S. "A neuronal formant synthesizer", *Journal of Mathematics and Computers in Simulation*, Special Issue on "Neural Networks/Neurocomputing", Vol. 40, Nos. 5-6, May 1996, pp. 615-622.

Scordilis, M.S., *Neural Network Control of a Cascade/Parallel Formant Synthesizer with Phoneme Dependent Voicing*, Ph.D. Dissertation, Clemson University, December 1990.

Grayden, D.B., Scordilis, M.S., "Phoneme Recognition in Fluent Speech Using Time-Delay and Fully Interconnected Neural Networks: A Comparison", accepted for publication in the *Australian Journal of Intelligent Information Processing Systems*, September 1996.

Grayden, D.B., Scordilis, M.S., "Using the Vowel Triangle in Automatic Speech Recognition", *Proceedings of the Sixth Australian International Conference on Speech Science and Technology, SST-96*, Adelaide, Dec 1996, pp. 313-318.

Veprek, P., Scordilis, M.S., "A Constrained DTW-Based Procedure for Speech Segmentation", *Proceedings of the Sixth Australian International Conference on Speech Science and Technology, SST-96*, Adelaide, Dec 1996, pp. 545-550.

Jenkin, K.L., Scordilis, M.S., "Automatic Syllable Stress Classification Methods", *Proceedings of the Sixth Australian International Conference on Speech Science and Technology, SST-96*, Adelaide, Dec 1996, pp. 31-36.

Jenkin, K.L., Scordilis, M.S., "Development and Comparison of Three Syllable Stress Parsers", *Proceedings of the 1996 International Conference on Spoken Language Processing, ICSLP*, Philadelphia, 3-6 Oct 1996, Vol. 2, pp. 733-736.

Grayden, D.B. and Scordilis, M.S., "ASOR: A Continuous Phoneme Recognition System Integrating Neural Networks and Phonetic Knowledge," *Proceedings of the International Conference on Neural Networks and Signal Processing, ICNNSP'95*, Vol. 1, Dec. 1995, pp. I.788-I.791.

Scordilis, M.S., Adams, S., "Experiments in Multi-microphone Speech Enhancement for Recognition", *Proceedings of the Fifth Australian International Conference on Speech Science and Technology, SST-94*, Perth, Australia, 6-8 Dec. 1994, pp. 63-68.

Grayden, D. B., Scordilis, M.S., "Phonemic Segmentation of Fluent Speech", *Proceedings of the 1994 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP94)*, pp. V.73-76.

Grayden, D. B., Scordilis, M.S., "Recognition of Obstruent Phonemes in Speaker-Independent Fluent Speech Using a Hierarchical Approach", *Proceedings of the 1993 European Speech Communication Conference, EUROSPEECH'93*, Berlin, 21-23 Sept. 1993, pp. 855-859.

Grayden, D. B., Scordilis, M.S., "TDNN vs. Fully Interconnected Multilayer Perceptron: A Comparative Study on Phoneme Recognition", *Proceedings of the Fourth Australian International Conference on Speech Science and Technology, SST-92*, Brisbane, Australia, 1-3 Dec. 1992, pp. 214-219.

Scordilis, M.S., Gowdy, J. N., "Speech Synthesis of Phonemic Triplets through a Neural Network-Controlled Formant Synthesizer", *Proceedings of the International Joint Conference in Neural Networks 1991*, Seattle, USA, (IJCNN'91 SEATTLE), Vol II, p A-1007.

Scordilis, M.S., Gowdy, J. N., "Neural Network Control for a Cascade/Parallel Formant Synthesizer", *Proceedings of the 1990 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP90)*, Albuquerque, NM, USA, 2-5 April 1990, pp. (S6a.1) 297-300.

Scordilis, M.S., Gowdy, J. N., "Neural Network-based Generation of Fundamental Frequency Contours", *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP89)*, May 24. Glasgow, Scotland. 1989, pp. (S16.S5.2) 219-222.

BIOGRAPHICAL SKETCH

NAME: Moiez A. Tapia

POSITION: Professor, Electrical & Computer Engineering Department, University of Miami

EDUCATION:

B.E. (E.E.) University of Poona (India), 1960
M.S. (E.E.) University of Illinois (Urbana), 1962
Ph.D. (E.E.) University of Notre Dame (Indiana), 1966

EXPERIENCE:

Sept. '87 - July '88 Graduate Co-ordinator & Professor
May '81 - Present Professor, University of Miami
May '82 - Aug. '82 ASEE - Navy Summer Research, Fellow
Naval Air Development Center, Warminster, Pa.
Aug. '74 - May '81 Associate Professor, University of Miami
June '72 - May '74 American Society for Engineering Education
Ford Foundation Resident Fellow
Computer Division, NASA Langley Research Center
Hampton, Va. 23665
Sept. '68 - Aug. '72 Assistant Professor, Georgia Institute of Technology,
Atlanta, Georgia, 30332
Sept. '67 - June '68 Assistant Professor, University of Miami
Sept. '66 - Aug. '67 Assistant Professor, Georgia Institute of Technology,
Atlanta, Georgia, 30332
Sept. '60 - Aug. '67 Assistant Lecturer, S.B. Polytechnic Institute
Bhavanagar, India
Jan. '60 - Aug. '60 Junior Engineer, Koyna Hydroelectric,
Bombay, India

PROFESSIONAL ACTIVITIES

IEEE Computer Society Distinguished Visitor, 1987-90
NASA-ASEE Summer Fellowship, May-July 1993
NAVY-ASEE Summer Fellowship, May 1982
ASEE-Ford Foundation Resident Fellowship at NASA Langley Research Center, Hampton, Va.
June 1972-Aug. 1974
Founding Chairman of Computer Society Chapter of Miami IEEE Section

RESEARCH GRANTS, CONTRACTS, AND AWARDS

Received College of Engineering Alexander Orr, Jr. Excellence in Teaching Award, 1995

1. IEEE Computer Society Distinguished Visitor, 1987-90
2. NASA-ASEE Summer Faculty Fellowship, Lecturer, May-July 1993.
3. Elected "Professor of the Week", February 1990

4. Received College of Engineering Alexander Orr, Jr. Excellence in Teaching Award, 1989.
5. Florida High Technology & Industry Council Research Grant Award for the year 1990, \$20,000.
6. NASA Grant #NGR 11-002-158, amount \$24,631 (Research in Computer Performance Evaluation), May 1972.
7. NAVY-ASEE Summer Faculty Fellowship, May-Aug. 1982.
8. NASA Grant #NGR 11-002-158, Supplement No. 1, amount \$12,030., May 1973.
9. NASA Grant #NGR 11-002-158, Supplement No. 2, amount \$11,000.
10. Voted one of the four Best (exact rank not disclosed) teacher in E.E. School, Georgia Tech. in Spring 1970.
11. A runner-up for Eta Kappa Nu Best Teacher Award in 1971.
12. Selected in December 1970 to receive A.S.E.E. Ford Foundation Resident Fellowship When "considerably less than half" of the candidates (nationally), nominated, were actually selected to receive it.
13. Received Certificate of Recognition for "Creative Development of Technology" from the National Aeronautics and Space Administration", May 2, 1975. Also, a \$50 award for it.

PUBLICATIONS:

1. "Statistical Evaluation of Accuracy of Computation Using Rational Type", co-author A.S. Boujarwah, *Int. Journal of Mini & Microcomputers*, Vol. 12, No. 1, 1990, pp. 7-11.
2. "Calculus for a Multivalued Logic Algebraic System", co-authors T.A. Guima and A. Katbab, *J. of Applied Mathematics & Computation*, 42:255-285 (1991).
3. "A Heuristic Method for Boolean Function Reduction", co-authors Deming Lee & A.S. Boujarwah, *Int. Journal of Electronics*, 1993, Vol. 74, No. 1, 73-92.

Other Publications

1. "Calculus for a Multivalued Logic Algebraic System", co-author T.A. Guima and A. Katbab, *Applied Mathematics and Computation*, 42:255-285, 1991.
2. "Object-Oriented Language Taxonomy", co-authored by Alexander Perez-Pons, *Proc. of IEEE Southeastcon'91*, Williamsburg, Va., April 8-10, 1991.
3. "Canonical Representation of Multivalued Logic Functions", co-author T.A. Guima, *Proc. of Southeastcon'92*, Birmingham, Alabama, April 12-15, 1992.
4. "Using Karnaugh Maps to Solve Boolean Equations by Successive Elimination", co-author J.H. Tucker, *Proc. of Southeastcon'92*, Birmingham, Alabama, April 12-15, 1992.
5. "Study of Parametric Representation of Cubes of a Boolean Function and Its Use in Reduction", co-author A.S. Boujarwah, *Proc. of IEEE Southeast Conference*, Charlotte, N.C., April 4-7, 1993.
6. "Comparave Analysis of Different Configurations of PLC-Based Safety Systems from Reliability Point of View", co-author V. William Wessel, Tech. Report, Systems Safety, Quality and Reliability Division, NASA Langley Research Center, Hampton, Va., Summer 1993.
7. "Minimum Parameter Solution of Switching Equations", co-author J.H. Tucker, *Proc. of IEEE Southeastcon'94*, April 10-13, 1994 (accepted for presentation and inclusion).
8. "Solution of a Class of Boolean Equations", co-author J.H. Tucker, *Proc. of IEEE Southeast Conference*, Raleigh, N.C., March 26-29, 1995.
9. "Reduction of Boolean Functions using Parametric Representation", co-author A.S. Boujarwah, *Int. Journal of Mini & Microcomputer*, Vol. 18, No. 1, 1996.
10. "Generalized Flip-flop Input Equations Based on a Four-valued Boolean Algebra", co-author J.H. Tucker, *Proc. of IEEE Southeast Conference*, Blacksburg, VA, April 11-14, 1997.

N a m e	Office Phone	e-mail address
John Stewart	284-1965	jstewart@umiami.ir.miami.edu
Deborah Mash	243-6324	
Victor Milenkovic	284-4194	vjm@cs.miami.edu
Michael Sacks	284-5434	msacks@coeds.eng.miami.edu
Sam Snedaker	361-4624	

UNIVERSITY OF MIAMI

Bachelors of Science in

**Information
Technology**

at

**Department of Electrical and
Computer Engineering**

College of Engineering

Bachelors of Science in Information Technology

1. Objectives

Today's dynamic and complex computing environment requires Information Technologists with hands-on experience in a variety of aspects of information technology. Individuals are now needed who are aware of design practices and tools, innovations, technical aspects of key technologies and system integration. Areas include Internet and Intranets, object-oriented modeling and design, agent technology, network computing, multimedia and enterprise solutions. Such individuals are in great demand but in short supply. By 2005, over one million new jobs will be created in information technology alone [America's New Deficit: The shortage of Information Technology Workers]. The Information Technology (IT) program at the College of Engineering, University of Miami will train students in state-of-the-art technologies required for a successful career in the areas of computer networks, network computing, communications, information modeling and information processing in the 21st century market place. The Information Technology (IT) program integrates these key technologies and provides students with the hands on experience necessary to meet 21st century challenges.

2. Introduction

Recent advancements in the world wide information infrastructure are dramatically changing our lives. This change is no less dramatic than that brought on by the printing press invented in the fifteenth century first initiated by Johann Gutenberg¹. Whereas it took centuries for mankind to fully benefit from this new technology, information technology has penetrated our lives within two decades. Information technology includes computers, computer networks, phone systems, satellite and broadcast media. These media of communication are universally available – day and night at our homes and at work, whenever and wherever they are needed. The modern technology infrastructure is able to handle a variety of information including text, graphics, audio and video, data and knowledge.

The modern information infrastructure provides us with easy access to distributed and heterogeneous information and services (related to shopping, entertainment, education, healthcare, law, politics, etc.). It also supports collaborative work among individuals from different organizations with different interests, different cultures and different abilities. These technologies also affect the way we deliver and receive education, electronic commerce, and healthcare records among other aspects of human society.

Information technology is radically altering the way software systems are developed and deployed to achieve a competitive advantage and survival for corporations. It changes the economics and possibilities of application development and its delivery. The rapidity and broad requirement for critical information has significantly expanded their Information Systems departments. Furthermore, easy access and manipulation of information has made many small businesses appear and survive relying heavily on

¹ The Gutenberg Bible was published at Mainz, France, by local printer Johann Gutenberg, 56, is a Vulgate bible that marks one of the earliest examples of printing from movable type in Europe in 1456. Gutenberg took 5 years to produce the bible, printing it in two volumes, folio, with two columns of 42 lines each per page.

the modern information infrastructure. These factors have created a significant number of job opportunities for information technologists.

Consequently, a large force of skilled graduates will be needed who are aware of a variety of aspects of information technology including techniques for encoding, storage, communication, manipulation and use of information in digital form.

2.1 Distinguishing Aspects of Program

Information Technology differs significantly from typical Computer Engineering and Science (CES) programs. In addition to computing, Information Technology places emphasis on computer connectivity, communication, system integration, interactive multimedia design, network computing, agent technology, information modeling, information processing, high performance computing, and technology deployment. It encompasses the full range of human communications including animation, simulation, virtual reality, video and sound. In the area of telecommunications, it places a new emphasis on broad bandwidth communication to establish a richer interface between humans and information.

2.2 Information Technology Education

The information technology education offered by this program will go beyond that of being a means of transferring technical education to students. It will provide them with tools that will enable them to discover, formulate and then solve real life problems that enterprises face.

The nature of complex problems in modern organizations requires an information technologist to systematically analyze problem areas to determine the most efficient cost-effective solutions. The overall design of the curriculum, and teaching methodologies will be geared towards building student skills in two related areas: Analysis of requirements and group problem solving in an information technology society. The students will gain the capability of solving real life challenges based on their understanding of Object Oriented analysis techniques, and experience in solving real life problems through group interactions. (See Appendix 2: Letter from Industry)

The program also includes a background in mathematics, physics and humanities and social sciences, some knowledge in Electrical Engineering (i.e. telecommunications and digital signal processing), and experience in design. A broad background in science and engineering will enable students to understand the “big picture” of information technology infrastructure and help them adapt to future developments in the field.

3. IT Program at College of Engineering, UM

3.1 Exact Title of Degree

Bachelor of Science in Information Technology.

3.2 Assessment of Demand and Job Market

There is a great demand for individuals with a broad knowledge of modern information technologies. The market place has shown the necessity for this program with the placement of computer engineers and computer scientists and the high salaries companies are willing to pay to attract quality individuals. Further enhancements in information technologies are expected to further proliferate information

technologies into the general society requiring more trained personnel to maintain and handle related infrastructure.

Information technology positions are found in government, business, and industry at all levels. Presently, there are the well defined positions of systems analyst, programmer, network manager, computer technologist, systems integrator, multimedia developer, facilities manager, and database administrator. Graduates of the program will be capable of providing the organization with the skills necessary for the day to day operation of computing infrastructure. Their knowledge and experience in interactive media, telecommunications, and interface design will make them especially valuable.

3.2.1 Survey of the Job Market

The range of areas covered by Information Technology program include telecommunications, interactive multimedia design, information storage and organization, computer-human interaction, microcomputers, and computer programming. Each of these areas has shown tremendous growth, and the trends indicate that the growth will continue in the future. It is estimated that the combined corporate network computing market will jump from \$12 billion in 1995 to \$208 billion by the year 2000². The Bureau of Labor Statistics', 1996-1997 *Occupational Outlook Handbook*³ lists information, computer and network related jobs as the fastest growing occupations at the Bachelor's level. It also lists some of these jobs as having the largest numerical increase in employment during the period 1994-2005. The IEEE U.S. Membership Salary and Fringe Benefit Survey (1995) declares the jobs in related areas as the best paid⁴. Since, graduates of the program will have a broader range of expertise covering several aspects of the jobs included in these surveys, we anticipate even better opportunities for them.

3.3 Resources: Laboratories

1. Network Computing Laboratory (New)
2. Multimedia Laboratory (Arnold Center for Confluent Media Studies)
3. Software Engineering Laboratory
4. Telecommunication and Networking Laboratory
5. Microprocessor Laboratory
6. Image Processing Laboratory
7. Digital Signal Processing Laboratory

3.4 Budget Analysis

The estimated enrollment in the fourth year is 50. The budget needs include salaries and fringe benefits to two new faculty (Assistant/Associate Professor level), a part-time staff member and two teaching assistants, phased in over four years.

² Estimates by a research firm in Mountain View, California.

³ <http://stats.bls.gov/oco/ocotjt1.htm>

⁴ The highest median incomes were reported by engineers in communications (\$70,138), and computers (\$69,929): 1995 IEEE U.S. Membership Salary and Fringe Benefit Survey

Table 1: Budget Analysis in 1997 Dollars

Budget Year	1998-99	1999-00	2000-01	2001-02	2002-03
Revenue					
Estimated Enrollment	10	23	36	50	50
Tuition generated	\$180,000	\$414,000	\$648,000	\$900,000	\$900,000
Financial Aid (27%)	\$48,600	\$111,780	\$174,960	\$243,000	\$243,000
<i>Net Revenue</i>	\$131,400	\$302,220	\$473,040	\$657,000	\$657,000
Expenses					
Faculty (Salary & FB)		\$90,000	\$90,000	\$180,000	\$180,000
Part-time staff (Salary & FB)			\$15,000	\$15,000	\$15,000
Teaching assistants (Inc. Tuition)		\$24,000	\$24,000	\$48,000	\$48,000
Equipment & Operating Costs	\$10,000	\$20,000	\$30,000	\$30,000	\$30,000
<i>Total Expenses</i>	\$10,000	\$134,000	\$159,000	\$273,000	\$273,000
ECE Costs/Net Revenue	7.6%	44.3%	33.6%	41.6%	41.6%

4. Faculty

Name	Specializations
Dr. Mansur R. Kabuka	Information Technology and Medical Informatics
Dr. John W. Collins	Object Oriented Programming and Artificial Intelligence
Dr. Christos Douligeris	Telecommunications and Computer Networks
Dr. Philip S. Liu	VLI Design, Computer Architecture, and Object Oriented Programming
Dr. Moiez A. Tapia	Fault Tolerance, and Object Oriented languages.
Dr. Saeed A. Rajput	Information Integration, Telecommunications, and Software Engineering
Dr. Michael S. Scordilis	Digital Signal and Speech Processing
Dr. Tzay Y. Young	Computer Vision, Image Processing and Pattern Recognition

We have the assurance of the administration that we have two faculty lines in information technology. We plan to recruit additional faculty members in the area of information technology when the enrollment reach the target as proposed.

The departments of Mathematics / Computer Science and Electrical and Computer Engineering have worked with their respective deans to develop a joint relationship. There will be a joint coordinating committee as stated in the draft agreement attached (Appendix 1). Thus, the IT students will have access to both CE and CS faculty, and to an expanded selection of courses.

5. New Courses⁵

In the following sections we provide detailed description of each new course.

EEN 400: Internet & Intranet: JAVA Computing

Object Oriented modeling concepts. Introduction to JAVA language. JAVA constructs and exceptions. Building and constructing JAVA applets. Java Tools: compiler, applet viewer and debugger. JAVA classes, JAVA graphical user interfaces, JAVA networking.

EEN 470: Object Oriented Windows

Introduction to message driven windows. Windows programming techniques and components including resource, device context, controls, and serializable objects. Document/view objects architecture, multitasking and object sharing.

EEN 540: Speech and Audio Processing

Introduction to speech production, hearing and perception, speech and audio signal analysis in time and frequency, speech and audio coding, speech synthesis and recognition, speaker recognition, language modeling and design of systems for human-machine spoken communication.

EEN 570: Network Client-Server Programming

Introduction to server-client systems. Internet server-client communication programming. Advanced server-client design and implementation based on distributed component object model in Windows, Unix, and VMS.

EEN 571: Interactive Multimedia Computing

Interactive multimedia technologies include hardware, software, standards, concepts and issues. Compression, Decompression, user interface design, query by content, multimedia indexing, and distributed multimedia.

EEN 572: Distributed Systems and Object Oriented Database Management

Object-Oriented modeling concepts in languages and database systems. Object Oriented database systems. Semantic data models, nested-relational object-relational databases. Distributed database system. Federated Databases. Application to engineering design problems.

EEN 573: Network Computing: The New Enterprise

Enterprise's Internet and Intranet architecture: scalability, language independence, and high availability. High performance computing: clustering and performance analysis. Integration through standards: object management model, reference object model, and IDL language. Directory services, Security: symmetric and public cryptography.

EEN 574: Agents Technology

Agent definition and applications, modeling and theories, representation (KIF), behavior, ethical and emotional agents, communication languages (KQML), development environments and tools, systems (Cooperative agents, Interface agents, Information agents, learning agents, believable agents, agents for workgroups, mobile agents), and case studies (Internet spiders, softbots, workflow robots, knowbots).

⁵ As noted in the draft agreement (Appendix 1), a common designation, CES, for courses in CE and CS will be implemented.

6. Curriculum

Bachelor of Science in Information Technology

A. General

	Course Title		Credits
	Social Sciences/Humanities Electives		18
ENG 105	English Composition		3
ENG 107	Scientific Writing		3
MTH 110	Calculus I		5
xxx 111	Introduction to Engineering I		3
xxx 112	Introduction to Engineering II	Pre: xxx 111	2
MTH 112	Calculus II	Pre: MTH 110 or 111	4
PHY 205	University Physics I	Pre: MTH 110, 111 or 131	3
PHY 207	University Physics III	Pre: PHY 205, MTH 112 or 132	3
PHY 209	University Physics III Lab	Pre or Co: PHY 207	1
MTH 210	Vectors and Matrices	Pre: MTH 112 or 132	3
	Subtotal		48

B. Required Courses

	Course Title		Credits
EEN 118/ MTH120	Introduction to C and Software Engineering		3
EEN 201	Electrical Circuit Theory	Pre or Co: MTH 112	3
EEN 304	Logic Design		3
EEN 307	Linear Circuit & Signals	Pre: EEN 201	3
MTH 309	Discrete Mathematics I		3
IEN 311	Applied Probability and Statistics	Pre or Co: MTH 112 or 132	3
EEN 312	Microprocessor	Pre: EEN 304	4
EEN 315	Digital Design Lab	Pre: EEN 304	1
EEN 317/ MTH 220	Algorithm and Data Structure in C++	Pre: EEN 118/MTH 120	3
EEN 400*	Internet & Intranet: JAVA Computing	Pre: EEN 317/MTH 220	3
EEN 404	Communication Systems	Pre: EEN 307	3
EEN 414	Computer Organization and Design	Pre: EEN 304	3
EEN 424*	UNIX Systems and Servers	Pre: EEN 317/MTH 220	3
EEN 436	Digital Signal Processing (DSP): Multimedia Approach	Pre: EEN 307	3

EEN 512	Object-Oriented Software Engineering	Pre: EEN 317/MTH 220	3
CIS 520	Analysis of Information Systems		3
EEN 523/ MTH 523	Principles of Database Systems	Pre: EEN 317/MTH 220	3
CIS 524	Design of Information Systems	Pre: CIS 520	3
EEN 534	Computer Communication Networks	Pre: EEN 312 and IEN 311	3
EEN 570*	Network Client-Server Programming	Pre: EEN 317/MTH 220	3
EEN 571*	Interactive Multimedia Computing	Pre: EEN 523/MTH 523	3
EEN 572*	Distributed Systems & Object-Oriented Database Management	Pre: EEN 523/MTH 523	3
EEN 573*	Network Computing: The New Enterprise	Pre: EEN 571 and EEN 572	3
	Subtotal		68

C. Electives (Select Three Courses)

	Course Title		Credits
EEN 470*	Object Oriented Windows	Pre: EEN 317/MTH 220	3
EEN 514	Computer Architecture	Pre: EEN 414	3
MTH 517	Data Structures and Algorithm Analysis	Pre: MTH 112, 220, and 309	3
EEN 519/ MTH 519	Programming Languages	Pre: EEN 317	3
MTH 529	Introduction to Computer Graphics	Pre: MTH 517	3
EEN 537/ MTH 545	Artificial Intelligence	Pre: EEN 317/MTH 220	3
EEN 538	Introduction to Digital Image Processing	Pre: MTH 210 and EEN 307	3
EEN 540*	Speech and Audio Processing	Pre: EEN 436	3
CIS 540	Telecommunications: Introduction and Fundamentals		3
MTH 544	Computer Modeling	Pre: MTH 224 (IEN 311) and MTH 517	3
EEN 546	Reliable Digital System Design	Pre: EEN 304 and EEN 315	3
EEN 548	Machine Learning	Pre: EEN 317/MTH 220	3
EEN 553	Neural Networks	Pre: IEN 311	3
EEN 574*	Agents Technology	Pre: EEN 537/MTH 545	3
	Subtotal		9

D. Senior Project

Senior Project	3
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Grand Total = 128 credits

7. Semester by Semester Table

Bachelor of Science in Information Technology

FRESHMAN YEAR

FIRST SEMESTER

MTH 110 Analytic Geometry & Calculus I	5
ENG 105 English Composition I	3
xxx 111 Introduction to Engineering I	3
EEN 118/ Introduction to C and Software	3
MTH120 Engineering	
Socio-Humanistic Elective	3

SECOND SEMESTER

MTH 112 Calculus II	4
PHY 205 University Physics I	3
ENG 107 Writing about Science	3
xxx 112 Introduction to Engineering II	2
Socio-Humanistic Elective	3
EEN 304 Logic Design	3

17

18

SOPHOMORE YEAR

FIRST SEMESTER

EEN 201 Electrical Circuit Theory	3
PHY 207 University Physics III	3
PHY 209 University Physics III Lab	1
MTH 309 Discrete Mathematics I	3
EEN 317/ Algorithms and Data	3
MTH 220 Structure in C++	
EEN 315 Digital Design Lab	1
Socio-Humanistic Elective	3

17

16

JUNIOR YEAR

FIRST SEMESTER

EEN 436 Int. to Digital Signal Processing	3
EEN 414 Computer Organizat. & Design	3
CIS 520 Analysis of Information Syst.	3
EEN 570 Network Client-Server Prog.	3
EEN 523 Princ. of Database Systems	3
Adv. Socio-Humanistic Elective	3

18

15

SECOND SEMESTER

EEN 404 Communication Systems	3
EEN 424 Unix Systems & Servers	3
EEN 512 Object-Oriented Software Eng.	3
CIS 524 Design of Information Systems	3
Socio-Humanistic Elective	3

FIRST SEMESTER

EEN 572 Distributed Systems & Object-Oriented Database Mgmt.	3
EEN 571 Interactive Multimedia Comp	3
EEN 534 Computer Comm. Networks	3
Elective	3
Elective	3

15

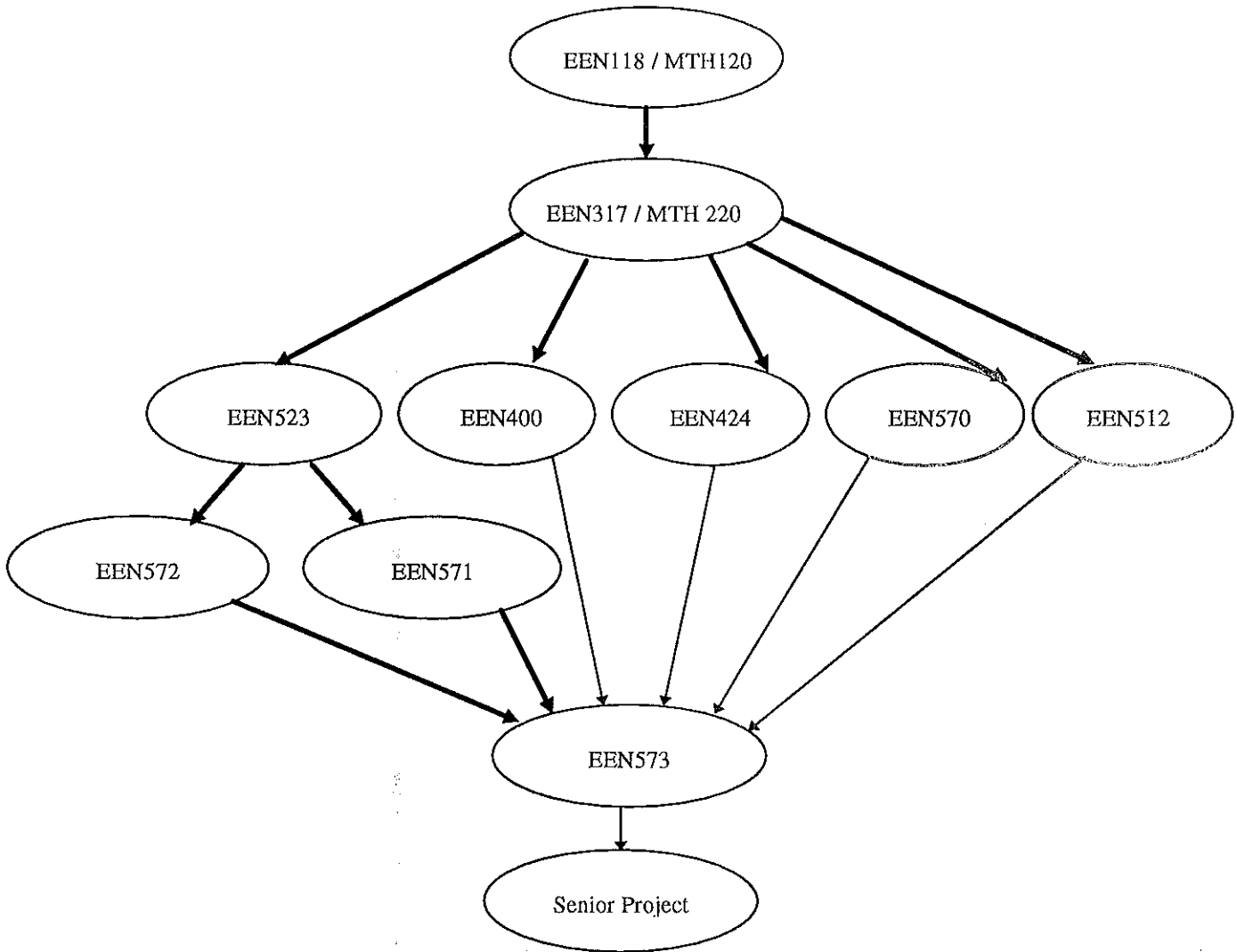
SECOND SEMESTER

EEN 573 Network Computing: The New Enterprise	3
Elective	3
Senior Project	3
Adv. Socio-Humanistic	3

12

Grand Total = 128 credits

8. Information Technology Core Courses



- EEN118 / MTH120 Introduction to C and Software Engineering
- EEN317 / MTH220 Engineering Data Structure in C++ Pre EEN118 / MTH120
- EEN400* Internet & Intranet: Java Computing Pre EEN317 / MTH220
- EEN424* Unix Systems and Servers Pre EEN317/MTH220
- EEN523 / MTH523 Principles of Database Systems Pre EEN317/MTH220
- EEN570* Network Client-Server Programming Pre EEN317/MTH220
- EEN 512 Object-Oriented Software Engineering Pre: EEN 317/MTH 220
- EEN572* Distributed Systems and Object-Oriented Database Management Pre EEN523
- EEN571* Interactive Multimedia Computing Pre EEN523
- EEN573* Network Computing: The New Enterprise Pre EEN571 and EEN572

* New Courses

9. Information Technology Options

Examples

Machine Intelligence

EEN 537/MTH 545	Artificial Intelligence
EEN 553	Neural Networks
EEN 548	Machine Learning
EEN 574	Agent Technology

Multimedia

EEN 538	Introduction to Digital Image Processing
EEN 571	Interactive Multimedia Computing
MTH 529	Introduction to Computer Graphics
EEN 540	Speech and Audio Processing

Others

10. Design Component of Core Courses in Information Technology Program

EEN 118

Description: Introduction to digital computers. Problem solving and program design, C language fundamentals, software engineering principles, and software design projects.

Design Component:

Students learn the principles and practice of Software Engineering and Software Design. Software design skills are developed and reinforced through a series of programming assignments, culminating in a software design project.

ABET Design Content: 50%.

EEN 312

Description: Microprocessor. Fundamentals of a microprocessor: architecture, instruction set, assembly language programming, serial and parallel input/output, polling, interrupts, interfacing, special features of protected mode operation of a pentium processor.

Design Component:

The course covers interfacing of distinct hardware devices using serial and parallel I/O, polling, and interrupt techniques.

ABET Design Content: 50%.

EEN 315

Description: Digital Design Lab. Use of various logic gates, flip-flops and integrated circuit packages. Design of synchronous and asynchronous digital systems. Design using Programmable Logic Devices, Computer Aided Engineering (CAE) Tools, and Hardware Description Languages (HDL).

Design Component:

Students learn the principles of digital system design and debugging using discrete gates, flip-flops, programmable logic, HDL and CAE tools. Design, debugging and report writing skills are developed through a set of design experiments.

ABET Design Content: 100%

EEN 317

Description: Introduction to C++. Features of C++ that apply to data structures. Essentials of data engineering and structures. Performance tradeoffs in using distinct approaches.

Design Component:

This course continues on the path started in EEN 118, adding advanced data structures to the students' programming toolkit. Covers the design of complex structures from simple components, such as arrays, linked-lists, queues, stacks, trees and hash tables. Also covers the design of recursive algorithms for sorting and searching.

ABET Design Content: 50%.

EEN 400

Description: Internet & Intranet: JAVA Computing. Object Oriented modeling concepts. Introduction to JAVA language. JAVA constructs and exceptions. Building and constructing JAVA applets. Java Tools: compiler, applet viewer and debugger. JAVA classes, JAVA graphical user interfaces, JAVA networking.

Design Content:

Students are introduced to the fundamentals of the Internet and Intranet. Objects oriented modeling and design are covered through various examples. Students will apply the object oriented concepts to writing OO JAVA programs. JAVA platform independence, user interface design, exception handling, and other JAVA concepts are covered. Students will complete a JAVA programming project.

ABET Design Content: 50%

EEN404

Description: Communication Systems. Theory and application of amplitude modulation, single sideband modulation, frequency modulation, noise figures and communication links.

Design Content:

Design communication circuits: double sideband AM, single sideband AM, FM, PCM. Design error control circuits Design basic digital communication correlators and filters.

ABET Design Content: 33%

EEN 414

Description: Organization and design of computers. Hardware description language. Instruction set architecture. Control unit implementation, microprogramming, memory organization, and high speed arithmetic unit.

Design Component:

Covers the design of modern computer architectures, from the gate level to the cpu. Includes design of instruction sets, memory organization, communications bus, cpu and alu.

ABET Design Content: 67%.

EEN 424

Description: Practical, hands-on experience with UNIX systems administration, including the setup and operation of a web server. Programming using UNIX shell scripting languages. Students will complete a CGI programming project.

Design Component:

Through the practical experience of designing a web-based application, students learn a variety of skills ranging from graphics design, to database schema design, to systems design.

ABET Design Content: 67%.

EEN 436

Description: Introduction to the basic principles of digital signal processing including: discrete-time systems and signals, z-transform, frequency response, discreteFourier transform and fast Fourier transform, design and implementation of digital filters, and applications in related field.

Design Content:

Systematic introduction to the use of MATLAB, a signal processing-oriented computer language. Programming and simulation of algorithms for digital signal processing. Design of digital filters. Design of real-time algorithms and implementation using digital signal processors in a laboratory environment.

ABET Design Content: 70%

EEN 470

Description: Object Oriented Windows. Introduction to message driven windows. Windows programming techniques and components including resource, device context, controls, and serializable objects. Document/view objectsarchitecture multitasking and object sharing.

Design:

Design using window's application programming interface (API). Graphical simulation, design and representation of internal computer data and control flows. Design and simulation of electronic instrument functions based on graphically generated interactive switches, controls, meters, screens and sensors.

ABET design content: 33%

EEN 512

Description: Object-oriented (o-o) modeling and design methodologies using object, dynamic and functional modeling; o-o software engineering. Survey of o-o programming languages, with emphasis on o-o features of C++. Practical application of these techniques to a software development project.

Design Component:

This course provides a thorough coverage of object-oriented modeling and design methodologies. Covers designing for reusability and hierarchical design of user-defined types.

ABET Design Content: 33%.

EEN 523

Description: Theory and design of database systems. Entity-relationship, relational, network, and hierarchical database models. Relational algebra and calculus, normalization, query languages/optimization, physical data organization, concurrency, security, recovery, and integrity. A relational database project is required.

Design Component:

This course covers database schema design using the entity-relationship model. The design of query languages and the physical and logical organization of data are covered. A project involving the design of a relational database reinforces the students' design experience.

ABET Design Content: 33%.

EEN534

Description: Principles of digital communications. Transmission media and switching schemes. Global and local area networks. Inter-relationship and essentials of network layers based in the OSI (Open Systems Interconnection) reference model. Protocols and routing. Network performance. Distributed processing.

Design Content:

Design of CRC encoders and decoders. Design of local area networks and wide area networks. Design of cryptographical tools. Design of interconnected networks.

ABET Design Content: 33%

EEN 540

Description: Introduction to speech production, hearing and perception, speech and audio signal analysis in time and frequency, speech and audio coding, speech synthesis and recognition, speaker recognition, language modeling and design of systems for human-machine spoken communication.

Design Content:

Presentation of methods for the analysis of speech in time and in frequency. Systematic introduction to the design of algorithms for speech and audio coding. Design of speech synthesis and recognition systems. Introduction to "Wizard-of-Oz" methods for the design of man-machine communication systems.

ABET Design Content: 50%

EEN 570

Description: Object Oriented Network Client-Server. Introduction to server-client systems. Internet server-client communication programming. Advanced server-client design and implementation based on distributed component object model in Windows.

Design:

Engineering design based on distributed coordinator (server) and designers (clients at different physical locations). Remote instrumentation and data collection, remote data analysis, central and collective analysis, feedback and remote control using client-server networks.

ABET design content: 33%

EEN 571

Description: Interactive Multimedia Computing. Interactive multimedia technologies include hardware, software, standards, concepts and issues. Compression, Decompression, user interface design, query by content, multimedia indexing, and distributed multimedia.

Design Component:

This course is designed for students to become familiar with a wide range of interactive multimedia technologies. Covers the design of multimedia documents using multimedia authoring tools. User interface design, hypermedia design, and distributed multimedia design are also covered.

ABET Design Content: 50%

EEN 572

Description: Distributed Systems and Object Oriented Database Management. Object-Oriented modeling concepts in languages and database systems. Object Oriented database systems. Semantic data models, nested-relational object-relational databases. Distributed database system. Federated Databases. Application to engineering design problems.

Design Component:

This course covers the design and architecture of object-oriented, distributed and federated database management systems, including the transaction manager and the query processor. It also covers the design process object databases, modeling, schema design and physical design. The course includes a project on object database design.

ABET Design Content: 50%

EEN573

Description: Network Computing: The New Enterprise. Enterprise's Internet and Intranet architecture: scalability, language independence, and high availability. High performance computing: clustering and performance analysis. Integration through standards: object management model, reference object model, and IDL language. Directory services, Security: symmetric and public cryptography.

Design Component:

Using most recent implementations of CORBA and Java, students will design and develop a small enterprise model. Each student will write at least one client and will provide server program. The class project will be designed in such a manner that students' implementations collectively work together to achieve a common goal. Simulation system will introduce real-life like problems over the network and create challenges for students.

ABET Design Content: 50%

EEN574

Description: Intelligent Agents. Agent definition and applications, agent modeling and theories, agent representation (KIF), agent behavior, ethical and emotional agents, agent communication languages (KQML), agent development environments and tools, agent systems (Cooperative agents, Interface agents, Information agents, learning agents, believable agents, agents for workgroups, mobile agents), and agent case studies.

Design Component:

Design topics covered include agent modeling, representation, behavior, communication languages, and multi-agent systems. Students will be introduced to agent development environments and case studies such as: Internet spiders, softbots, workflow robots, and knowbots.

ABET Design Content: 33%

11. Detailed Description of new Courses

11.1 EEN 400:

Title: Internet & Intranet: JAVA Computing

Course Description

Object Oriented modeling concepts. Introduction to JAVA language. JAVA constructs and exceptions. Building and constructing JAVA applets. Java Tools: compiler, applet viewer and debugger. JAVA classes, JAVA graphical user interfaces, JAVA networking.

Prerequisite: EEN317 / MTH220

Textbook: TBA

Course Coordinator: Professor Mansur R. Kabuka

Topics

- ◆ Object Oriented Modeling concepts
 - classes and methods
 - inheritance
 - dynamic binding and polymorphism
 - abstract classes
 - object identity
- ◆ Introduction to JAVA language
 - JAVA as an Object Oriented language
 - HotJAVA/browsers overview
 - JAVA code
- ◆ JAVA constructs and Exceptions: statements, identifiers, literals, variables, declarations, assignments, arrays, operators, flow controls, exceptions, and exception handling.
- ◆ Building and Customizing JAVAApplets
 - applet class and method
 - applet tag/accessing parameter through HTML
- ◆ JAVA Tools
 - JAVA Compiler (JAVAC) and applet viewer
 - JAVA debugger (JDB)
- ◆ JAVA Classes
 - JAVA. lang package.
 - classes: method, character, numeric wrappers, Boolean, string, vectors.
- ◆ JAVA Graphical User Interfaces: buttons, text fields, panels, labels, lists and scrollbars.
- ◆ JAVA Networking
 - threads
 - I/O streams
 - file I/O
 - sockets

11.2 EEN 470:

Title: Object Oriented Windows

Course Description

Introduction to message driven windows. Windows programming techniques and components including resource, device context, controls, and serializable objects. Document/view objects architecture, multitasking and object sharing.

Prerequisite: EEN317 / MTH220

Text: J. Prosis, "Programming Windows with MFC," Microsoft Press, 1996.

Instructor: Professor Philip S. Liu

Topics

- ◆ Message driven programming
- ◆ Message map
- ◆ Microsoft foundation classes and objects
- ◆ Device context objects
- ◆ Resources objects
- ◆ Controls objects
- ◆ Advanced controls implementation
- ◆ Modal and modeless dialog controls
- ◆ Property sheets
- ◆ Document/view architecture
- ◆ Single document interface
- ◆ Multiple documents and multiple views
- ◆ Pallets and region classes
- ◆ Multitasking and object sharing
- ◆ Serialization

11.3 EEN 540

Title: Digital Speech and Audio Processing

Course Description

Introduction to speech production, hearing and perception, speech and audio signal analysis in time and frequency, speech and audio coding, speech synthesis and recognition, speaker recognition, language modeling and design of systems for human-machine spoken communication.

Prerequisite: EEN 436

Textbook: TBA.

Instructor: Dr. Michael Scordilis, Associate Professor.

Topics

- ◆ Man-machine communication: a strategic, interdisciplinary research and development area.
- ◆ Human speech production.
 - structure of the speech production system
 - articulatory and acoustic phonetics
 - acoustic theory of speech production
 - coarticulation and prosody
- ◆ Hearing and perception
 - anatomy and physiology of the ear
 - sound perception
 - temporal and frequency masking
 - vowel and consonant perception, and intonation
- ◆ Speech and audio signal analysis
 - short-time analysis
 - frequency domain analysis
 - pitch extraction
 - feature extraction
 - signal processing and reconstruction
 - signal enhancement and noise suppression
- ◆ Speech and audio coding
 - A/D conversion and quantization
 - PCM, ADPCM, Linear predictive coding, Vocoders, Vector quantization
 - G.721, G.728, MPEG, APC and Dolby coders, DAB
- ◆ Speech synthesis
 - articulatory, time and frequency domain synthesis techniques
 - Unrestricted text-to-speech synthesis

Projects:

Students will be offered the opportunity to implement real speech and audio processing applications through projects focusing on any of the areas covered in this course.

11.4 EEN 570

Network Client-Server Programming

Course Description

Introduction to server-client systems. Internet server-client communication programming. Advanced server-client design and implementation based on distributed component object model in Windows and Unix.

Prerequisite: EEN317 / MTH220

Textbooks:

1. G. Gromer, "Server-Client Programming and Applications," Prentice Hall, 1996.
2. D. Kruglinoki, "Inside Distributed Component Object Model," Microsoft Press, 1997.

Instructor: Professor Philip S. Liu

Topics

- ◆ Transport Control Protocol/Internet Protocol (TCP/IP)
- ◆ Windows blocking and non-blocking sockets
- ◆ Simple server-client applications
- ◆ Dual channel/function server/client, FTP server/client
- ◆ Remote procedure calls (RPC)
- ◆ Distributed component object model (DCOM) for sever-client applications
- ◆ DCOM based Active X documents and components
- ◆ Active X automation and controls
- ◆ Active servers and clients
- ◆ Server-side open database connectivity
- ◆ Common gateway interface and scripting

11.5 EEN 571

Title: Interactive Multimedia Computing

Course Description

Interactive multimedia technologies include hardware, software, standards, concepts and issues. Compression, Decompression, user interface design, query by content, multimedia indexing, and distributed multimedia.

Prerequisite: EEN523 / MTH523.

Text Book: P.K. Andleigh and K. Thakar, "Multimedia System Design," Prentice Hall, 1995.

Course Coordinator: Professor Mansur R. Kabuka

Topics

- ◆ Introduction to multimedia and multimedia tools
 - multimedia data types
 - I/O and storage Devices
 - multimedia applications (Video on demand, video conferencing, interactive TV, home shopping, remote home care, distance learning, digital libraries)
- ◆ Compression and decompression
 - quality of service requirements for transport
 - lossy vs. Lossless compression
 - standards: JPEG, MPEG, MPEG2, AVI, Quick Time, and H320.
- ◆ User Interface Design
 - human factor issues
 - interactive multimedia authoring systems
 - hypermedia design
 - compound documents
- ◆ Querying and content-based retrieval of multimedia
 - extracting features: manual vs. Automatic
 - iconic indexing and visual queries
 - similarity search (nearest neighbor, spatial similarity)
 - evaluating query response: recall and precision
 - user relevance feedback
- ◆ Indexing Multimedia objects
 - single Key index structures
 - multi-attribute and spatial indexing
 - indexing for content retrieval (inverted lists, signature files)
- ◆ Distributed multimedia
 - requirements for interactive multimedia networking
 - network architecture and protocols to support continuous media
 - distributed services (RPC, names servers)

Projects: Through projects students will learn how to capture, represent, store, compress, manipulate, interact with, and present text, drawings, still images, animations, audio and video.

11.6 EEN 572

Title: Distributed Systems and Object Oriented Database Management

Course Description

Object-Oriented modeling concepts in languages and database systems. Object Oriented database systems. Semantic data models, nested-relational object-relational databases. Distributed database system. Federated Databases. Application to engineering design problems.

Prerequisite: EEN 523 or MTH 523.

Text Book: Ozsu and P.Valduriez. "Principles of distributed database systems,"Prentice-Hall, 1991.

Instructor: New faculty member

Topics

- ◆ Object-Oriented modeling concepts
 - classes, methods and messages
 - inheritance
 - dynamic binding and polymorphism
 - abstract classes
 - object identity
- ◆ Object-Oriented Databases
 - persistence
 - collections
 - class extents
 - data retrieval
- ◆ Other advanced database models
 - nested-relational model
 - semantic data models
 - object-relational databases
- ◆ Distributed database systems
 - architecture of distributed Database Management Systems
 - distributed database design
 - query processing
 - transaction management
- ◆ Federated and multidatabases
- ◆ Engineering applications

11.7 EEN 573

Title: Network Computing: The New Enterprise

Course Description

Enterprise's Internet and Intranet architecture: scalability, language independence, and high availability. High performance computing: clustering and performance analysis. Integration through standards: object management model, reference object model, and IDL language. Directory services, Security: symmetric and public cryptography.

Prerequisite: EEN571 and EEN572

Reference Book: Siegel, "CORBA: Fundamentals and Programming," Wiley 1996.

Course Coordinator: Professor Mansur R. Kabuka

Topics

- ◆ Enterprise Internet/Intranet Architecture
 - scalability, integration, and language independence
 - location transparency, distributed concurrency control, and distributed administration
 - cost-effective computing power
 - reliability, availability and serviceability
 - fault tolerance, and high availability
 - security and directory services
- ◆ High Performance computing
 - clustering
 - scalability and performance analysis
- ◆ Integration through standards (CORBA)
 - Object Management Architecture
 - Reference Object Model
 - IDL Language
 - Frameworks
 - Object Services
 - Common Facilities
 - Business Objects
- ◆ Directory services
 - X.500 standards for directory services
- ◆ Security
 - symmetric key cryptography
 - public key cryptography
 - certificates and certification authorities
 - security standards

11.8 EEN 574

Title: Agents Technology

Course Description

Agent definition and applications, agent modeling and theories, agent representation (KIF), agent behavior, ethical and emotional agents, agent communication languages (KQML), agent development environments and tools, agent systems (Cooperative agents, Interface agents, Information agents, learning agents, believable agents, agents for workgroups, mobile agents), and agent case studies.

Prerequisite: EEN 537 or MTH545

Textbook: TBA

Course Coordinator: Professor Mansur R. Kabuka

Topics

- ◆ Introduction to intelligent agents
 - Intelligent agent definition
 - Intelligent agent applications (news agents, internet agents, operating system agents, workflow systems)
- ◆ Agent Theories
 - Actor Theory/Subsumption Architecture/ Meta Language Formalism/ Possible world semantics/ speech act theory.
 - Agent models: Intention, belief, and desire
 - Modeling multi-agent systems
 - Agent representation: KIF (Knowledge Interchange Format)
 - Communication modeling
- ◆ Agent behavior
 - veracity, autonomy, commitment
 - ethical agents (safety, tidiness, thrift, vigilance)
 - emotional agents
 - negotiation
- ◆ Agent languages
 - object oriented languages: JOULE, CORBA
 - agent oriented languages: KQML (Knowledge Query and Manipulation Language), AGENT-0
- ◆ Agent development environments and tools
 - programming tools (agent building shell)
 - end-user design and programming (KidsSIM)
 - frameworks (APRIL, DESIRE)
- ◆ Agent systems: cooperative agents, interface agents, information agents, learning agents, believable agents, agents for workgroups, mobile agents.
- ◆ Case Studies: OS agents, internet robots, spiders and wanderers, SoftBots, KnowBots, workflow agents, news agents.

BIOGRAPHICAL SKETCH

Name: **Dr. Mansur R. Kabuka** Position Title: **Professor and Director
Professor of Computer Engineering & Radiology**

Institution	Degree	Field of Study
Univ. of Virginia, Charlottesville	Ph.D.	Computer Engineering
University of Miami, Florida	M.S.	Computer Engineering
University of Alexandria	B.S.	Computer Science

EXPERIENCE

Dr. Mansur R. Kabuka has over fifteen years of experience in **information technology**, seven years in medical information systems, and extensive experience in real-time computing and high speed networking. Dr. Kabuka was an active member of the Florida High Technology and Industry Council: The Computer Integrated Engineering. He reviewed numerous large scale interdisciplinary projects and centers. Dr. Kabuka is the founder and director of the Medical Imaging and Medical Informatics Center. He initiated and played a principal role in establishing M.S. Medical Informatics program at UM, School of Medicine, the off-campus M.S. in Computer Science at IBM, Boca Raton, FL, (with Math and Computer Science Dept.), and the M.S. in Industrial Electronics & Computers at McDonnell Douglas (Titusville, FL). Dr. Kabuka received several grants and obtained donations from several companies valued at three million dollars.

Some of the Information Technology Projects Recently Successfully Completed:

1. **Design, Implementation and Deployment of a Mission Critical High Performance Enterprise: Distributed High Speed Network and Interactive Media for Medical Applications**
2. **Digital Radiology Infrastructure (DRI)**
3. **Integrated Registration Facility (IRF)**
4. **Global Patient Registration System (GPRS)**
5. **Multimedia Diagnosis Workstation (MDW)**
6. **Clinician Workstation (CW)**
7. **Cooperative Medicine Workstation (CMW)**
8. **Automatic Data Entry (ADE)**
9. **Cardiology Workstation**

PUBLICATIONS

SELECTED PAPERS (1993-1996)

1. Kabuka, M.R. (with E. El-Kwae), "A Robust Frame Work for Content-Based Retrieval by Spatial Similarity in Image Databases," ACM Trans. on Information Systems, In press.
2. Kabuka, M.R. (with W. Li), "New Volume Rendering Model Using Weighted Compositing," IEEE Trans. on Medical Imaging, In press.
3. Kabuka, M.R. (with S. Bhide and N. John), "A Boolean Neural Network Approach for the TSP," IEEE Trans. on Computer, Vol. 42, number 10, pp 1271-1278, 1993.
4. Kabuka, M.R. (with Basit Hussain), "A Novel Feature Recognition Neural Network," IEEE Trans. on Pattern Analysis and Machine Intelligence, vol. 16, number 1, pp. 98-106, 1994.
5. Kabuka, M.R. (with Andres Rios), "Image Compression with a Dynamic Autoassociative Neural Network," Journal of Mathematical and Computer Modelling (Invited), 1994.
6. Kabuka, M.R. (with S. Gazula), "Real-Time Supervised Classifiers using Boolean Neural Networks," IEEE Trans. on Pattern Analysis and Machine Intelligence, vol 17, no. 12, Dec. 1995.

7. Kabuka, M.R. (with A. Rios), "A High Performance Neural Network-based Compression System for MR Images," the Society of Magnetic Resonance in Medicine 12th Annual Meeting, 1993.
8. Kabuka, M.R. (with A. Younis), "Adaptive Classification and Compression of MR Images using Neural Network Architecture," the Soc. of Magnetic Resonance in Medicine 12th Meeting, 1993.
9. Kabuka, M.R. (with Gregory M. Shebert), "An Improvement to the Neural Network Compression of Medical Image Data," IEEE Data Compression Conference, March 1993.
10. Kabuka, M.R. (with Markus Gudmundsson), "An Integrated Patient Oriented Workstation for Radiological Diagnosis," IEEE Engineering in Medicine and Biology Conference, 1993.
11. Kabuka, M.R. (with D. Xu), "Image Analysis of 3-D Micromotion of Porous-Coated Femoral Prostheses," IEEE Computer-based Medical Systems Symposium, 1993.
12. Kabuka, M.R. (with S. Bhattacharjee), "Face Image Analysis for the Study of Human Emotions," IEEE Engineering in Medicine and Biology Conference, 1993.
13. Kabuka, M.R. (with S. Bhide, S. Gazula and G. Shebert), "An ASIC Implementation of a User Configurable Boolean Neural Network Chip," World Congress on Neural Networks, 1993.
14. Kabuka, M.R. (with S. Bhide and N. John), "A Real-time Solution for the TSP using Boolean Neural Network," IEEE Int. Conf. on Neural Networks, 1993.
15. Kabuka (with E. Figueredo), "A Visual Medical Image Processing and Visualization System," SPIE Conference, Medical Imaging, 1994.
16. Kabuka, M.R. (with T. Wan), "Edge-Preserving Image Compression for Magnetic-Resonance Images Using DANN-based Neural Network," SPIE Conference, Medical Imaging, 1994.
17. Kabuka, M.R. (with A. Rios), "Neural Network Compression for Medical Images: Dynamic Autoassociative Neural Network (DANN) Codec," SPIE Conference Medical Imaging, 1994.
18. Kabuka, M.R. (with N. John, X. Li, A. Younis), "Towards Automatic Segmentation of MR Brain Images," SPIE Conference, Medical Imaging, 1994.
19. Kabuka, M.R. (with W. Sull), "Paradigm for Having a Logical Data Integration Between PACS and HIS," SPIE Conference, Medical Imaging, 1994.
20. Kabuka, M.R. (with S. Banerjee), "ATM-based Fiber Optic Network for Scalable and Modular PACS Design," SPIE Conference, Medical Imaging, 1994.
21. Kabuka, M.R. (with Maria J. Bianchi), "An Algorithm for Detection of Masses, Microcalcification and Skin Contours in Mammograms," Symposium for Computer Assisted Radiology, 1994.
22. Kabuka, M.R. (with X. Li and S. Bhide), "Labelling of MR Brain Images using a Boolean Neural Network," Symposium for Computer Assisted Radiology, 1994.
23. Kabuka, M.R. (with X. Li and N. John), "A Statistical Approach to the Segmentation of MR Brain Images," The Society of Magnetic Resonance Meeting, San Francisco, 1994.
24. Kabuka, M.R. (with S.M. Bhide), "Image Segmentation with Boolean Neural Networks for Medical Imaging," The Society of Magnetic Resonance Meeting, San Francisco, 1994.
25. Kabuka, M.R. (with F. Sauer), "Multimedia Technology in Radiology Department," ACM Multimedia 94, San Francisco, 1994.
26. Kabuka, M.R. (with S. Bhide, N. Borko, N. John, F. Sauer, W. Sull, S. Waly, and A. Younis), "Integration of Medical Information Systems using Object-Oriented Technology," OOPSLA'94 Workshop on Object-Oriented Technology for Health Care and Medical Information Systems, Portland, 1994.
27. Kabuka, M.R. (with S. Bhide, N. Borko, N. John, F. Sauer, W. Sull, S. Waly, and A. Younis), "Applying Object Oriented Technology in the Integration of Legacy Databases," Eleventh International Symposium on the Creation of Electronic Health Record Systems and Global Conference on Patient Cards, Orlando, Florida, 1995.
28. Kabuka, M.R. (with F. Sauer, S. Waly), "Automatic Data Entry Using Scanning and Color Segmentation of Driving Licenses", Eleventh International Symposium on the Creation of Electronic Health Record Systems and Global Conference on Patient Cards, Orlando, Florida, 1995.
29. Kabuka, M.R. (with X. Li), "Labeling of MR Brain Images Using a Boolean Neural Network," IEEE Trans. on Medical Imaging, in press.
30. Kabuka, M.R. (with E. El-Kwae and Maria Bianchi), "Detection of Malignant Regions in 3D MRI Breast Images using a Boolean Neural Network," SCAR 96 Symposium for Computer Assisted Radiology, June 6-9, 1996, Denver, Colorado.

31. Kabuka, M.R. (with E. El-Kwae), "An Autonomous Boolean Neural Network System for Image Understanding," ANNIE Conference, St. Louis, MO, 1996.
32. Kabuka, M.R. (with K. Abdalla), "Functional Integration Technique for CORBA-Based Interoperable Information Systems," submitted to Sixth Int. Conference on Information and Knowledge Management, Nov. 1997.

BIOGRAPHICAL SKETCH

NAME: John William Collins

POSITION: Assistant Professor
Department of Electrical and Computer Engineering
University of Miami

EDUCATION:

Ph.D. , & Computer Science, University of Illinois, January, 1994. GPA: 5.0/5.0
M.S. , & Computer Science, University of Illinois, May 1988. GPA: 5.0/5.0
B.S. , & Mechanical Engineering, Rose-Hulman Institute of Technology, May 1979. GPA:
3.6/4.0

EXPERIENCE:

1992--present Assistant Professor, U. of Miami.
1986--1992 Research Assistant, Computer Science, U. of Illinois.
1979--1985 Senior Research Engineer, Applied Research Group,
Motorola Portable Products Division -- Communications Sector, Plantation Florida.

PROFESSIONAL ACTIVITIES

Member, Phi Kappa Phi national honor society
Member, Eta Kappa Nu electrical engineering honor society
Recipient, Cognitive Science/Artificial Intelligence Fellowship, 1988-1989
Research Assistant, University of Illinois Dept. of Computer Science, 1986-1992
Graduated with honors from Rose-Hulman Inst. of Technology, Spring 1979
Recipient, National Merit Commended Student Award, Spring 1975.

FUNDED RESEARCH:

"Ocean Status Information Management System", National Oceanographic and Atmospheric Administration, 1995-1996. (\$70,000 with Dr. Douligeris), Co-Principal Investigator.

"An Adaptive Decision Support System for Oil Spill Countermeasures", United States Coast Guard, 1994-1995, (\$39,079 with Drs C. Douligeris and E. Iakovou) Task Principal Investigator.

"Object-Oriented Database Design for Oil Spill Management System", United States Coast Guard, 1994-1995 (\$42,736, with Dr. A. Thakore), Task Co-Principal Investigator.

"Geographic Information Systems and Advanced Visualization Techniques", United States Coast Guard, 1994-1995 (\$125,237, with Drs C. Douligeris, A. Thakore and B. Baca).

"Asynchronous Transfer Mode (ATM) Switching for Legacy Systems", BellSouth Corporation and General DataComm, 1995-1996. P.I. (\$100,000, approx. \$50,000 of which is equipment).

PUBLICATIONS:

JURIED OR REFEREED JOURNAL ARTICLES:

Douligeris, C., Collins, J., Iakovou, E., Sun, P., Riggs, R., and Mooers, C., "Development of OSIMS: An Oil Spill Information Management System", *Spill Science and Technology Bulletin*, 1996.

REFEREED CONFERENCE PROCEEDINGS:

1. Douligeris, C., Collins, J., Baca, B., Blanco, R. and Jacobs, J., "OSIMS: An Oil Spill Information Management System", 1997 International Oil Spill Conference, Ft. Lauderdale, FL, April 7-10, 1997.
2. Collins, J., Douligeris, C. "An Internet-Based Information Management System for Oil Spill Response." In Proc. of the ECO-INFORMA 96 Conference, Orlando, FL, November, 1996.
3. Douligeris, C., Collins, J., Blanco, R., Jacobs, J. "Experience with a South Florida Oil Spill Information Management System." In Proceedings of the OCEANS 96 MTS/IEEE Conference, Fort Lauderdale, FL, September, 1996.
4. Collins, J., Riggs, R. & Douligeris, C. "Spinning an Expert Information System on the World Wide Web Knowledge Sources", TIEMEC '96.
5. Douligeris, C., Collins, J., Iakovou, E., Sun, P. and Riggs, R. "Designing an Oil Spill Information Management System", The International Emergency Management and Engineering Conference 1995, Nice, France, May 9-12, 1995, pp. 386-391.
6. Collins, J, Xiong, X. and Kabuka, M. "Monitoring and Distributing Processes in a Local Area Network", EURO-PAR'95.
7. Collins, J. and DeCoste, D. "CATMS: An ATMS which avoids Label Explosions." In Proc. of the Ninth National Conference on Artificial Intelligence, Los Angeles, CA, July 1991.
8. Collins, J. and Forbus, K. "Reasoning about Fluids Via Molecular Collections." In Proceedings of the Sixth National Conference on Artificial Intelligence, Seattle, WA, July, 1987. Also appears in D. Weld and J. deKleer, editors, *Readings in Qualitative Reasoning about Physical Systems*, Morgan Kaufman, San Mateo, CA, 1990.
9. Collins, J. "A Neural Network Based on Co-Occurrence Probabilities." In Proceedings of the First IEEE International Conference on Neural Networks, San Diego, CA, June, 1987.

OTHER CONFERENCE ABSTRACTS AND PRESENTATIONS:

1. Douligeris, C. and Collins, J., "Design of Prototype Oil Spill Information Management System", Florida Coastal Ocean Sciences and Technology Symposium 1996 (FCOSTS96), 9-10 April 1996, Harbor Branch Institute, Ft. Pierce FL.
2. Douligeris, C., Collins, J., Iakovou, E., and Mooers, C., "OSIMS: A Prototype Oil Spill Information Management System." Second International Oil Spill Research and Development Forum, London, May 23-26, 1995, pp. 774-781.
3. Douligeris, C., Collins, J., Iakovou, E., Sun, P. and Riggs, R., "Designing an Oil Spill Information Management System." The International Emergency Management and Engineering Conference 1995, Nice, France, May 9-12, 1995, pp. 386-391.

TECHNICAL REPORTS:

1. Collins, J. "Process-Based Diagnosis: An Approach to Understanding Novel Failures." PhD thesis, University of Illinois at Urbana-Champaign, January 1994. (Technical Report UIUCDCS-R-94-1846.)

BIOGRAPHICAL SKETCH

NAME: Christos Douligeris

POSITION: Associate Professor

EDUCATION:

Columbia University, M.S. 1985, M. Phil. 1987, Ph.D. 1989
National Technical University of Athens, Greece
Dept. of Electrical Engineering, Diploma in E.E., July 1984

EXPERIENCE:

1989-present Dept. of Electrical & Computer Engineering, Univ. of Miami,
Associate Professor
1994-present Ocean Pollution Research Ctr, Assoc. Director for Engineering
May-June '90 INRS Telecommunications, Univ. of Quebec, Visiting Scientist
1984-1989 Columbia University, Research Assistant

PROFESSIONAL ACTIVITIES

IEEE Communications Society (Member since 1989)
IEEE Communications Society, Computer Communications Tech. Committee
(Member since 1989)
ORSA, Special Interest Group on Telecommunications (Assoc. Member since
1989)
ACM, Special Interest Group on Computer Communications, (Assoc. Member
since 1994)
Technical Chamber of Greece (Member since 1984)

FUNDED RESEARCH

"Analysis of Contingency Plans in the Gulf of Mexico", NOAA Seagrant 1996-97
(\$187,000), P.I.
"Ocean Status Information Management System", NOAA, 1995-96 (\$70,000), P.I.
"Human Factors in Oil Spill Incidents", Dept. of Transportation, 1995-96
(\$96,772), P.I. Dr. E. Iakovou.

PUBLICATIONS

BOOKS AND MONOGRAPHS

1. Douligeris, C., "Optimal Flow Control and Fairness in Communications Networks - A Game Theoretic Perspective", Ph.D. Dissertation, Columbia Univ., 1990, Univ. Microfilms International, Ann Arbor, MI, 146 pp.

2. Douligeris, C., "Stability Properties of Power Transmission Lines", Diploma Thesis, Nat. Tech. Univ. of Athens, Athens, Greece, 1987.

SELECTED JOURNAL ARTICLES

1. K.G. Zografos, C. Douligeris and P. Tsoumpas, "An Integrated Framework for Managing Emergency Response Operations: The Case of the Electric Utility Companies", IEEE Trans. on Engineering Management, Special Issue on Emergency Management and Eng., 1996 (invited), to appear.
2. L.N. Kumar and C. Douligeris, "Demand and Service Matching at Heavy Loads: A Dynamic Bandwidth Control Mechanism for DQDB MANs", IEEE Trans. on Communications, Vol. 44, No. 11, Nov. 1996, pp. 1485-1495.
3. Y.C. Liu and C. Douligeris, "Rate Regulation with Feedback Controller in ATM Networks - A Neural Network Approach", IEEE JSAC Special Issue on Computational Intelligence for High Speed Networks, February 1997, Vol. 115, No. 2, pp. 200-208.
4. H. Fahmy, G. Develekos, and C. Douligeris, "Application of Neural Networks and Machine Learning in Network Design", IEEE JSAC Special Issue on Computational Intelligence for High Speed Networks, February 1997, Vol. 115, No. 2, pp. 226-237.
5. H. Fahmy and C. Douligeris, "END: An Expert Network Designer", IEEE Network, November/December 1995, Vol. 9, No. 6, pp. 18-27.
6. C. Douligeris and I. Pereira, "A Telecommunications Quality Study Using the Analytic Hierarchy Process, IEEE Journal on Selected Areas on Communications, Special Issue on Quality and Telecommunication Services, Networks and Products, Vol. 12, No. 2, Feb 1994, pp. 241-250.
7. C. Douligeris and R. Mazumdar, "Multilevel Flow Control in Telecommunication Networks", Journal of the Franklin Inst., Vol. 331B, No. 4, 1994, pp. 417-433.
8. C. Douligeris, "Multiobjective Flow Control in Delay Constrained Telecommunication Networks", Journal of the Franklin Inst., Vol. 331B, No. 1, pp. 77-100, Jan. 1994.
9. L.N. Kumar, C. Douligeris and G. Develekos, "Implementation and Performance Analysis of a Decentralised Multiclass Flow Control Algorithm Using Pareto Optimal Criterion", Computer Communications, Vol. 17, No. 8, August 1994, pp. 600-610.
10. C. Douligeris and L.N. Kumar, "Fairness Issues in the Networking Environment: A Survey", Computer Communications, Vol. 18, No. 4, April 1995, pp. 288-299.
11. C. Douligeris and R. Mazumdar, "Efficient Flow Control in a Multiclass Telecommunications Environment", IEE Proc., Part I, Vol. 138, No. 6, December '91.
12. T.C. Wan and C. Douligeris, "Improved Estimator for a Discretized Learning Algorithm", Electronics Letters, Vol. 30, No. 2, 108-110, January 1994.
13. S. Liebesman, C. Douligeris and H. Pham, "Quality Assurance Management", IEEE Comm. Magazine, Special Issue on Quality Assurance Management, Editorial, October 1994, p. 25.

BIOGRAPHICAL SKETCH

NAME: Philip S. Liu

POSITION: Professor

EDUCATION:

Ph.D. (Computer Engineering), Purdue University, 1975
M.S.E.E. (Electrical Engineering), Purdue University, 1972
B.S.E.E. (Electrical Engineering), University of Wisconsin, 1970

EXPERIENCE:

Professor, University of Miami, Dept. of Electrical & Computer Engineering.
Twenty two years. Original appointment August 1975.
MTS, Advanced Technology Group, Bell Laboratories, 1982-83.

PROFESSIONAL ACTIVITIES

IEEE Computer Society
The Institute of Electrical and Electronics Engineers Inc., Senior Member
Association of Computing Machinery
Eta Kappa Nu

FUNDED RESEARCH:

NSF VLSI design fabrication award, 517-NSF-ACLAS/UMIAMI-ENGR.
NSF supercomputer research grant for undergraduate program
Sun Microsystem research equipment grant,
Computing grant
NSF grant "Advanced Digital Design Laboratory"
NSF grant, "Database Compression".

PUBLICATIONS:

1. P.S. Liu and L. Martinez, "Partitioned Schemes of Mapping Neural Networks onto Mesh-Connected Computers", Proc. of IEEE South-East Conference, April 1994.
2. P.S. Liu, "Problem Size Independent Processor Array", Int. Journal on Micro and Minicomputers, Vol. 1, pp. 86-89, Jan. 1990.
3. P.S. Liu and J. Data, "A Pipeline Approach to Problem Size Independent (VLSI) Processor Arrays", Int. Journal on Micro and Minicomputers, pp. 86-89, 1990.
4. B. Furht and P.S. Liu, "Interfacing and Communication Experiments", IEEE Trans. on Education, pp. 124-128, April 1989.

5. P.S. Liu, "Problem Size Independent VLSI Processor Array", Proc. Int. Conference on Mini and Microcomputers, pp. 147-150, Dec. 1988.
6. P.S. Liu, "Optimal and Broadcasting VLSI Processor Arrays", Proc. 1987 Miami Int. Technicon, pp. 212-216, Oct. 1987.
7. T.Y. Young and P.S. Liu, "VLSI Architecture for Pattern Recognition and Image Processing", in Pattern Recognition and Image Processing Handbook, Academic Press, pp. 471-496, 1986.
8. T.Y. Young, P.S. Liu and H.H. Liu, "Applications of VLSI to Pattern Recognition and Image Processing", VLSI Handbook, edited by N.G. Einspruch, Academic Press, pp. 785-799, 1985.
9. P.S. Liu, "Problem Size Independent VLSI Processor Array", Proc. Int. Conference on Mini and Microcomputers, pp. 147-150, Dec. 1988.
10. P.S. Liu, "Optimal and Broadcasting VLSI Processor Arrays", Proc. 1987 Miami Int. Technicon, pp. 212-216, Oct. 1987 (leadoff paper in computer engineering).
11. P.S. Liu, "Pipelined Data Broadcasting in VLSI Processor Array Design", submitted to IEEE Transactions on Computers.
12. T.Y. Young and P.S. Liu, "VLSI Architecture for Pattern Recognition and Image Processing", in Pattern Recognition and Image Processing Handbook, Academic Press, pp. 471-496, 1986.
13. T.Y. Young, P.S. Liu and H.H. Liu, "Applications of VLSI to Pattern Recognition and Image Processing", VLSI Handbook, edited by N.G. Einspruch, Academic Press, pp. 785-799, 1985.
14. T.Y. Young and P.S. Liu, "VLSI Arrays for Pattern Recognition and Image Processing: I/O Bandwidth Considerations", VLSI for Pattern Recognition and Image Processing, edited by K.S. Fu, Springer-Verlag, New York, pp. 25-42, 1984.
15. P.S. Liu and T.Y. Young, "VLSI Array Design under Constraints of Limited I/O Bandwidth", IEEE Trans. on Computers, pp. 1160-1170, Dec. 1983.
16. P.S. Liu and T.Y. Young, "VLSI Array Architecture for Picture Processing", Picture Engineering, K.S. Fu and T.L. Kunil, Eds., Springer-Verlag, pp. 171-186, 1982.
17. P.S. Liu, "An Approach to Automatic Generation of Globally Area-Time Efficient VLSI Processor Array Design", Proc. Automation 86, pp. 101-105, March 1986 (plenary session).

Bibliographical Sketch

Name: Saeed A. Rajput

Position: Sr. Research Associate

Education

- Ph.D. Univ. of Southern California, (USC) May 1992. Communications Sciences Institute.
- M.S. Univ. of Southern California, May 1990. Communications Sciences Institute.
- M.S. Philips International Institute (PII), Eindhoven, The Netherlands, 1987, (Distinction).
- B.Sc. Engineering with Honors, Univ. of Engineering and Tech. Lahore, 1985. (Third Position).

Teaching Experience

- Apr. 1996: University of Miami: Graduate Course in Medical Informatics.
- Aug. 1993- Apr. 1995: National University of Sciences and Technology, Islamabad (Affiliated with Michigan State University), Associate Professor
- Jul. 1993 - Jan. 1994: Quaid-e-Azam University, Islamabad, Visiting Associate Professor
- 1993 University of Engineering and Technology, Lahore, Visiting Associate Professor
- Aug. 1992- Aug. 1993: Ghulam Ishaq Khan Institute, Pakistan, Academic Advisor
- Jan. 1991 - May 1992: West Coast University, Los Angeles, Visiting Instructor
- Jan. 1991- Dec. 1992 University of Southern California, Los Angeles, Teaching Assistant

Research, Development, and Industrial Experience

- Jan. 1996 - Present: Senior Research Associate at University of Miami, Department of Radiology, Center for Medical Imaging and Medical Informatics
Object oriented analysis, design and development of healthcare software systems, *integration of healthcare computer networks* that carry multimedia information. Implementation of healthcare computer networks.
- Apr. 1995- Jan. 1996: Senior Software Engineer at Time Warner Communications
Performing *Object Oriented Analysis*, guiding object oriented design and leading software development teams for development of various Telecommunication software packages including circuit design application for the engineering department design and work flow management applications for SONET networks and 5ESS switches. Developing project management methodology for a highly dynamic and changing environment. Projects included circuit design and work flow management applications for Telecommunication networks and switches.
- Sep. 1993- Dec. 1994: Project Leader for Telecom Foundation
Design and Implementation of Telecommunication Equipment based on software and hardware for switching for connecting PVCs.
- Jul. 1993- Apr. 1995: Project Leader at Central Telecommunication Research Laboratories
Analysis, design, and implementation of a automatic fault analysis and reporting systems for telephone exchanges. System included a queuing system, a reporting database and a computer network based on LAN and WAN.
- Jul. 1992- Aug. 1994: Development on Contract for National University of Science and Technology
- Jun. 1989- May92: Research Assistant at Communications Sciences Institute, University of Southern California, Los Angeles
- May 1986 - Aug. 1986 and Dec. 1986 - Jul. 1987: Research Assistant at Philips Research Laboratory
- Feb. 1985 Jan. 1986: Contract Engineer at Central Telecommunications Research Laboratories

Professional Activities

Member IEEE.

Publications

1. "A Co-designed Coding, Modulation and Equalization Scheme for the Transmission of 155.52 Mbit/s Data over a 72 MHz IntelSat Transponder. Part 2: Equalization," International Journal of Satellite Communications, Vol. 11, No. 6, Nov.-Dec. 1993, pp. 335-365.
2. "A Co-designed Decision Feedback Equalizer Deinterleaver and Decoder," Proceedings, Globecom'91, Arizona, 1991, pp. 1165-1169.
3. "Co-designed Decision Feedback Equalizer Deinterleaver and Decoder," Ph.D. Dissertation, Univ. of Southern California, April 1992.
4. "On Use of Feedback for Simplifying Viterbi Detector," Philips J. of Research, 1988. Vol. 42.

BIOGRAPHICAL SKETCH

NAME: MICHAEL S. SCORDILIS

POSITION: ASSOCIATE PROFESSOR

EDUCATION: Ph.D. in Electrical Engineering (1990), Clemson University, Clemson, SC, USA.
M.S. in Electrical Engineering (1986), Clemson University, Clemson, SC, USA.
B.E. in Communications Engineering (1984), Royal Melbourne Institute of Technology, Melbourne, Australia.

EXPERIENCE

- Since 1/1997: Associate Professor, Department of Electrical and Computer Engineering, University of Miami.
- 12/1995-1/1997: Senior Researcher, The European Union DIALOGOS, and ACCESS Projects (Man-Machine Speech Dialogues), Wire Communications Laboratory, Department of Electrical and Computer Engineering, The University of Patras, Rion, Greece.
- 4/1996-1/1997: Senior Engineer, Language Engineering Research, KNOWLEDGE, S.A. Patras, Greece.
- 9/1990-11/1995: University Lecturer (Level B - Confirmed), Department of Electrical and Electronic Engineering, The University of Melbourne, Melbourne, Australia.
- 3/1994-7/1994: Visiting Senior Scientist, Sun Microsystems Laboratories, Speech Recognition Group, Chelmsford, MA, USA.
- 1/1994-3/1994: Visiting Senior Scientist, Bell Communications Research (Bellcore), Speech Analysis and Synthesis Group, Morristown, N.J., USA.
- 1988-: Project Consultant and Software Developer, For several private companies and public institutions in Melbourne, Australia and in the United States.
- 1984-1990: Research Fellow and Teaching Assistant, Department of Electrical and Computer Engineering, Clemson, S.C., USA.
- 1982-1984: Technical Officer, (Production and Testing of the AXE and ASB900 Digital Telephone Exchanges), L. M. Ericsson, Melbourne, Australia.
- 11/80-2/81: Computer Hardware Developer, Compuserve, Newcastle, Australia.

PROFESSIONAL ACTIVITIES

PROFESSIONAL CONSULTING

- 1992-97: Text-to-Speech synthesis (Bellcore USA & Robotrpn, Melbourne, Australia), Speech Recognition (Sun Microsystems, USA & Collaborative Information Technology Research Institute, CITRI, Melbourne, Australia), DSP and Audio (Analog Devices, Norwood, Massachusetts, USA, and Melbourne, Australia), Modem design and Audio processing (EDL, Melbourne, Australia), Acoustics (Australian National Acoustic Laboratories)

FUNDED RESEARCH

- 1997-98: "WWW-based Interactive Instruction to Digital Signal Processing", University of Miami
- 1996-: "Development of Masters Degree programme in Speech Communication Sciences", European Programme SOCRATES/ERASMUS Thematic Network
- 1995-97: "Electronic monitoring of fishways", Murray-Darling Basin, NSW Fisheries Research Institute
- 1994: "The potential for a non-intrusive, non-destructive instrument for monitoring fish behaviour", Land and Water Resources Research and Development Corporation

1991-1993: "Children's Perception and Production of Speech", Australian Research Council (A.R.C.)
1991-1992: "Speech Compression with Artificial Neural Networks"
1990-1991: "Speech Synthesis using Artificial Neural Networks", A.R.C.

REPRESENTATIVE PUBLICATIONS

Scordilis, M.S., "A Neural Network Cluster for the Control of a Speech Synthesizer", in Tzafestas, S.G. (ed.), *Engineering Systems with Intelligence: Concepts, Tools and Applications*, Kluwer Academic Publishers 1991, pp. 229-235.

Scordilis, M.S., "Current Speech Technology and the Need for Robust Processing", *Australian Speech Science and Technology Association Bulletin*, No. 12, September 1995, pp. 3-4.

Scordilis, M.S., Gowdy, J. N., "A Neural Network-based Control Strategy for a Speech Formant Synthesizer", *Journal of Artificial Neural Networks*, Vol. 2, No. 3, 1995, pp. 195-103.

Scordilis, M.S. "A neuronal formant synthesizer", *Journal of Mathematics and Computers in Simulation*, Special Issue on "Neural Networks/Neurocomputing", Vol. 40, Nos. 5-6, May 1996, pp. 615-622.

Scordilis, M.S., *Neural Network Control of a Cascade/Parallel Formant Synthesizer with Phoneme Dependent Voicing*, Ph.D. Dissertation, Clemson University, December 1990.

Grayden, D.B., Scordilis, M.S., "Phoneme Recognition in Fluent Speech Using Time-Delay and Fully Interconnected Neural Networks: A Comparison", accepted for publication in the *Australian Journal of Intelligent Information Processing Systems*, September 1996.

Grayden, D.B., Scordilis, M.S., "Using the Vowel Triangle in Automatic Speech Recognition", *Proceedings of the Sixth Australian International Conference on Speech Science and Technology, SST-96, Adelaide, Dec 1996*, pp. 313-318.

Veprek, P., Scordilis, M.S., "A Constrained DTW-Based Procedure for Speech Segmentation", *Proceedings of the Sixth Australian International Conference on Speech Science and Technology, SST-96, Adelaide, Dec 1996*, pp. 545-550.

Jenkin, K.L., Scordilis, M.S., "Automatic Syllable Stress Classification Methods", *Proceedings of the Sixth Australian International Conference on Speech Science and Technology, SST-96, Adelaide, Dec 1996*, pp. 31-36.

Jenkin, K.L., Scordilis, M.S., "Development and Comparison of Three Syllable Stress Parsers", *Proceedings of the 1996 International Conference on Spoken Language Processing, ICSLP, Philadelphia, 3-6 Oct 1996*, Vol. 2, pp. 733-736.

Grayden, D.B. and Scordilis, M.S., "ASOR: A Continuous Phoneme Recognition System Integrating Neural Networks and Phonetic Knowledge," *Proceedings of the International Conference on Neural Networks and Signal Processing, ICNNSP'95*, Vol. 1, Dec. 1995, pp. I.788-I.791.

Scordilis, M.S., Adams, S., "Experiments in Multi-microphone Speech Enhancement for Recognition", *Proceedings of the Fifth Australian International Conference on Speech Science and Technology, SST-94, Perth, Australia, 6-8 Dec. 1994*, pp. 63-68.

Grayden, D. B., Scordilis, M.S., "Phonemic Segmentation of Fluent Speech", *Proceedings of the 1994 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP94)*, pp. V.73-76.

Grayden, D. B., Scordilis, M.S., "Recognition of Obstruent Phonemes in Speaker-Independent Fluent Speech Using a Hierarchical Approach", *Proceedings of the 1993 European Speech Communication Conference, EUROSPEECH'93, Berlin, 21-23 Sept. 1993*, pp. 855-859.

Grayden, D. B., Scordilis, M.S., "TDNN vs. Fully Interconnected Multilayer Perceptron: A Comparative Study on Phoneme Recognition", *Proceedings of the Fourth Australian International Conference on Speech Science and Technology, SST-92, Brisbane, Australia, 1-3 Dec. 1992*, pp. 214-219.

Scordilis, M.S., Gowdy, J. N., "Speech Synthesis of Phonemic Triplets through a Neural Network-Controlled Formant Synthesizer", *Proceedings of the International Joint Conference in Neural Networks 1991, Seattle, USA, (IJCNN'91 SEATTLE)*, Vol II, p A-1007.

Scordilis, M.S., Gowdy, J. N., "Neural Network Control for a Cascade/Parallel Formant Synthesizer", *Proceedings of the 1990 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP90)*, Albuquerque, NM, USA, 2-5 April 1990, pp. (S6a.1) 297-300.

Scordilis, M.S., Gowdy, J. N., "Neural Network-based Generation of Fundamental Frequency Contours", *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP89)*, May 24, Glasgow, Scotland, 1989, pp. (S16.S5.2) 219-222.

BIOGRAPHICAL SKETCH

NAME: Moiez A. Tapia

POSITION: Professor, Electrical & Computer Engineering Department, University of Miami

EDUCATION:

B.E. (E.E.)	University of Poona (India), 1960
M.S. (E.E.)	University of Illinois (Urbana), 1962
Ph.D. (E.E.)	University of Notre Dame (Indiana), 1966

EXPERIENCE:

Sept. '87 - July '88	Graduate Co-ordinator & Professor
May '81 - Present	Professor, University of Miami
May '82 - Aug. '82	ASEE - Navy Summer Research, Fellow Naval Air Development Center, Warminster, Pa.
Aug. '74 - May '81	Associate Professor, University of Miami
June '72 - May '74	American Society for Engineering Education Ford Foundation Resident Fellow Computer Division, NASA Langley Research Center Hampton, Va. 23665
Sept. '68 - Aug. '72	Assistant Professor, Georgia Institute of Technology, Atlanta, Georgia, 30332
Sept. '67 - June '68	Assistant Professor, University of Miami
Sept. '66 - Aug. '67	Assistant Professor, Georgia Institute of Technology, Atlanta, Georgia, 30332
Sept. '60 - Aug. '67	Assistant Lecturer, S.B. Polytechnic Institute Bhavanagar, India
Jan. '60 - Aug. '60	Junior Engineer, Koyna Hydroelectric, Bombay, India

PROFESSIONAL ACTIVITIES

IEEE Computer Society Distinguished Visitor, 1987-90
NASA-ASEE Summer Fellowship, May-July 1993
NAVY-ASEE Summer Fellowship, May 1982
ASEE-Ford Foundation Resident Fellowship at NASA Langley Research Center, Hampton, Va.
June 1972-Aug. 1974
Founding Chairman of Computer Society Chapter of Miami IEEE Section

RESEARCH GRANTS, CONTRACTS, AND AWARDS

Received College of Engineering Alexander Orr, Jr. Excellence in Teaching Award, 1995

1. IEEE Computer Society Distinguished Visitor, 1987-90
2. NASA-ASEE Summer Faculty Fellowship, Lecturer, May-July 1993.
3. Elected "Professor of the Week", February 1990

4. Received College of Engineering Alexander Orr, Jr. Excellence in Teaching Award, 1989.
5. Florida High Technology & Industry Council Research Grant Award for the year 1990, \$20,000.
6. NASA Grant #NGR 11-002-158, amount \$24,631 (Research in Computer Performance Evaluation), May 1972.
7. NAVY-ASEE Summer Faculty Fellowship, May-Aug. 1982.
8. NASA Grant #NGR 11-002-158, Supplement No. 1, amount \$12,030., May 1973.
9. NASA Grant #NGR 11-002-158, Supplement No. 2, amount \$11,000.
10. Voted one of the four Best (exact rank not disclosed) teacher in E.E. School, Georgia Tech. in Spring 1970.
11. A runner-up for Eta Kappa Nu Best Teacher Award in 1971.
12. Selected in December 1970 to receive A.S.E.E. Ford Foundation Resident Fellowship When "considerably less than half" of the candidates (nationally), nominated, were actually selected to receive it.
13. Received Certificate of Recognition for "Creative Development of Technology" from the National Aeronautics and Space Administration", May 2, 1975. Also, a \$50 award for it.

PUBLICATIONS:

1. "Statistical Evaluation of Accuracy of Computation Using Rational Type", co-author A.S. Boujarwah, *Int. Journal of Mini & Microcomputers*, Vol. 12, No. 1, 1990, pp. 7-11.
2. "Calculus for a Multivalued Logic Algebraic System", co-authors T.A. Guima and A. Katbab, *J. of Applied Mathematics & Computation*, 42:255-285 (1991).
3. "A Heuristic Method for Boolean Function Reduction", co-authors Deming Lee & A.S. Boujarwah, *Int. Journal of Electronics*, 1993, Vol. 74, No. 1, 73-92.

Other Publications

1. "Calculus for a Multivalued Logic Algebraic System", co-author T.A. Guima and A. Katbab, *Applied Mathematics and Computation*, 42:255-285, 1991.
2. "Object-Oriented Language Taxonomy", co-authored by Alexander Perez-Pons, Proc. of IEEE Southeastcon'91, Williamsburg, Va., April 8-10, 1991.
3. "Canonical Representation of Multivalued Logic Functions", co-author T.A. Guima, Proc. of Southeastcon'92, Birmingham, Alabama, April 12-15, 1992.
4. "Using Karnaugh Maps to Solve Boolean Equations by Successive Elimination", co-author J.H. Tucker, Proc. of Southeastcon'92, Birmingham, Alabama, April 12-15, 1992.
5. "Study of Parametric Representation of Cubes of a Boolean Function and Its Use in Reduction", co-author A.S. Boujarwah, Proc. of IEEE Southeast Conference, Charlotte, N.C., April 4-7, 1993.
6. "Comparave Analysis of Different Configurations of PLC-Based Safety Systems from Reliability Point of View", co-author V. William Wessel, Tech. Report, Systems Safety, Quality and Reliability Division, NASA Langley Research Center, Hampton, Va., Summer 1993.
7. "Minimum Parameter Solution of Switching Equations", co-author J.H. Tucker, Proc. of IEEE Southeastcon'94, April 10-13, 1994 (accepted for presentation and inclusion).
8. "Solution of a Class of Boolean Equations", co-author J.H. Tucker, Proc. of IEEE Southeast Conference, Raleigh, N.C., March 26-29, 1995.
9. "Reduction of Boolean Functions using Parametric Representation", co-author A.S. Boujarwah, *Int. Journal of Mini & Microcomputer*, Vol. 18, No. 1, 1996.
10. "Generalized Flip-flop Input Equations Based on a Four-valued Boolean Algebra", co-author J.H. Tucker, Proc. of IEEE Southeast Conference, Blacksburg, VA, April 11-14, 1997.

BIOGRAPHICAL SKETCH

NAME: TZAY Y. YOUNG
POSITION: Professor and Chairman
Department of Electrical & Computer Engineering

EDUCATION:

B.S.E.E., National Taiwan University
M.S.E.E., University of Vermont
Dr. Eng., Johns Hopkins University

PROFESSIONAL ACTIVITIES:

Fellow, IEEE, American Men and Women of Science, Who's Who in America. Sigma Xi, Eta Kappa Nu
Member of Editorial Committee, IEEE Trans. on Pattern Analysis and Machine Intelligence, 1979-1984.
Member of Advisory Board, IEEE Trans. on Pattern Analysis and Machine Intelligence, 1984-1990.
Associate Editor for Pattern Recognition and Artificial Intelligence, IEEE Trans. on Computers, 1974-1976.
Member, Technical Committee on Machine Pattern Analysis, IEEE Computer Society, 1974-present.
Chairman, Technical Programs, IEEE Global Communications Conference, Dec. 1982.
General Chairman, IEEE Computer Society Workshop on Computer Architecture for Pattern Analysis and
Image Database Management, Nov. 1985.
Co-Chairman, Technical Program, IEEE Southeastcon, April 1994.

EXPERIENCE:

University of Miami, Department of Electrical and Computer Engineering,
Professor, 1974-present. Acting Chairman, 1988-1991; Chairman, 1991-present.
Carnegie-Mellon University, Department of Electrical Engineering,
Assistant Professor, 1964-1968; Associate Professor, 1968-1974.
N.A.S.A. Goddard Space Flight Center, Communications and Navigation Division,
Senior Research Associate, 1972-1973 (on sabbatical leave).
Bell Laboratories, Murray Hill, N.J. Member of Technical Staff, 1963-1964,
Johns Hopkins University, Caryle-Barton Laboratory, Research Associate, 1962-1963.

FUNDED RESEARCH:

NSF Grants for three-dimensional motion analysis from images; three-dimensional shape
recovery from a single view; multilinear approach to data file compression; stochastic
approximation algorithms for pattern recognition and signal processing; resolution and
extraction of overlapping signals.
NASA Grant for optimum signal processing for meteorological radar.
NIH Grant (Co-PI) for neural system modeling.
FHTIC Grants for computer software for dynamic scene analysis; neural network algorithms
for computer vision and automation.
Industrial Grants for subpixel edge detection with a line scan camera; computer simulation of
power line carrier system; applying image processing techniques for cleft-palate images.

PUBLICATIONS:

BOOKS

T.Y. Young and T.W. Calvert, Classification, Estimation and Pattern Recognition, Elsevier,
New York, 1974.

T.Y. Young and K.S. Fu, Eds., Handbook of Pattern Recognition and Image Processing, Academic Press, Orlando, 1986.

T.Y. Young, Ed., Handbook of Pattern Recognition and Image Processing, vol. 2: Computer Vision, Academic Press, San Diego, 1994.

SELECTED JOURNAL ARTICLES AND BOOK CHAPTERS:

1. Y. Ding and T.Y. Young, "Complete Shape from Imperfect Contour: A Rule Based Approach", Computer Vision and Image Understanding, to appear., 1997
2. S.R. Yhann and T.Y. Young, "Boundary Localization and Texture Segmentation", IEEE Trans. on Image Processing, vol. 4, pp 849-856, 1995.
3. W.J. Shomar and T.Y. Young, "Three-Dimensional Shape Recovery from Line Drawings", in Handbook of Pattern Recognition and Image Processing, vol. 2: Computer Vision, T. Y. Young, Ed., Academic Press, pp. 53-100, 1994.
4. W. Zhao, T.Y. Young and M.D. Ginsberg, "Registration and Three-Dimensional Reconstruction of Autoradiographic Images by the Disparity Analysis Method", IEEE Trans. on Medical Imaging, vol. 12, pp. 782-791, 1993.
5. W.J. Shomar, G. Seetharaman and T.Y. Young, "An Expert System for Recovering 3D Shape and Orientation from a Single View", Computer Vision and Image Processing, L.G. Shapiro and A.R. Rosenfeld, Eds., pp. 459-515, Academic Press, 1992.
6. G.J. Salem and T.Y. Young, "A Neural Network Approach to the Labeling of Line Drawings", IEEE Trans. on Computers, vol. C-40, pp. 1419-1424, 1991.
7. M. Cohn, M. Trefler and T.Y. Young, "Enhancement and Compression of Digital Chest X Rays", Journal of Thoracic Imaging, vol. 5, pp. 92-95, 1990.
8. W.-Z. Zhao, F.-H Qi and T.Y. Young, "Dynamic Estimation of Optical Flow Using Objective Functions", Image and Vision Computing, vol. 7, pp. 259-267, 1989.
9. Y.-S. Li, T.Y. Young and C. -C. Huang, "Noncontact Measurement Using Line Scan Cameras: Analysis of Positioning Error", IEEE Trans. on Industrial Electronics, vol. IE-36, pp. 545-551, 1989.
10. T.Y. Young, S. Gunasekaran and W.-Z. Zhao, "Analysis and Extraction of Three Dimensional Motion Information from an Image Sequence", Advances in Artificial Intelligence Research, vol. 1, M.B. Fishman, Ed., JAI Press, Greenwich, Conn., pp. 209-223, 1989.
11. E.T. Lee, T.Y. Young, T.K. Ho and W.J. Shomar, "Pictorial Knowledge and Its Application to Space Object Surveillance", Advances in Artificial Intelligence Research, vol. 1, M.B. Fishman, Ed., JAI Press, Greenwich, Conn., pp. 309-345, 1989.
12. S. Gunasekaran and T.Y. Young, "A Region Correspondence Approach to the Recovery of 3D Motion and Structure in Dynamic Scenes", in Image Understanding in Unstructured Environment, S. Chen, Ed., World Scientific Series, pp. 75-123, 1989.
13. H.H. Liu, T.Y. Young and A. Das, "A Multilevel Parallel Processing Approach to Scene Labelling Problems", IEEE Trans. on Pattern Analysis and Machine Intelligence, vol. PAMI-10, pp. 586-590, 1988.
14. T.Y. Young, Y.S. Li and J.A. Magerl, "Noncontact Measurement Using Line Scan Cameras with Subpixel Accuracy", Iron and Steel Engineer, vol. 65, no. 6, pp. 40-46, 1988.
15. Y.S. Li, T.Y. Young, and J.A. Magerl, "Subpixel Edge Detection and Estimation with a Microprocessor-Controlled Line Scan Camera", IEEE Trans. on Industrial Electronics, vol. IE-35, pp. 105-112, 1988.
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17. R.N. Nelson and T.Y. Young, "Determining Three-Dimensional Object Shape and Orientation from a Single Perspective View", Optical Engineering (Special issue on Applications of Artificial Intelligence), vol. 25, pp. 394-401, 1986.
18. T.Y. Young and P.S. Liu, "VLSI Array Architecture for Pattern Analysis and Image Processing", in Handbook of Pattern Recognition and Image Processing, T.Y. Young and K.S. Fu, Editors, pp. 471-495, Academic Press, Orlando, 1986.
19. T.Y. Young, P.S. Liu and H.H. Liu, "Applications of VLSI to Pattern Recognition and Image Processing", in VLSI Handbook, N.G. Einspruch, Ed., pp. 785-799, Academic Press, Orlando, 1985.

Appendix 1

A Framework of Computer Science and Computer Engineering Programs and Courses

Return-path: <azame@bellsouth.net>
Date: Thu, 11 Dec 1997 17:04:03 -0500
From: Alan Zame <azame@bellsouth.net>
Subject: cs/ce framework
To: swamy@miami.edu
Organization: University of Miami

We have approved the version of the framework that follows. There are some differences with engineering's version, and an additional section. We feel very strongly that the common designation must be "CSE". In fact, Stewart himself objected to the CES designation for, if nothing else, being too much like "CIS".

1. Use the common designation CSE for all courses pertaining to computer science or computer engineering. The catalog will list all CSE course in a single location along with descriptions of the CS and CE programs and a list of faculty who have taught or teach these courses. To the extent that it becomes necessary, the deans will ensure that tuition revenue by the two units are appropriately tracked and credited.
2. Appoint a committee made up of two faculty from each department (to be appointed by the two deans in consultation with the respective chairs) who, along with the respective chairs will jointly coordinate CS/CE course schedule and course changes.
3. The degree programs continue to reside where they currently reside. Each CSE course is assigned a "home" department based on the nature of the content; CSE courses will be distributed equitably between the two departments. The content of a course that serves as a requirement to a degree that is in the other college will be determined by mutual agreement of the relevant faculty in the two departments, paying attention to national standards and relevant accreditation requirements.
4. All qualified regular faculty in both departments may teach the CSE courses, but must adhere to the agreed upon syllabi. The course schedule for each semester will be prepared jointly by the coordinating committee. Any disagreements will be referred to the two deans. The assignment of non-tenure track faculty to teach courses should be carefully monitored by both deans to assure high quality for the courses.
5. Both colleges will coordinate their student recruitment efforts for the computing degree programs.
6. The coordinating committee will make recommendations to the respective departments as to the most desired area needed to fill a vacancy.
7. The CSE designation and the coordination of course should in all cases be designed to strengthen the two departments' separate missions: teaching science, and teaching engineering. For the sake of enrollment and the image of the university, science students should not be forced, nor should they even have the perception that they are being forced, to study engineering solely for reasons of economy, and vice versa.

If you have any problems with this, or if you otherwise feel we need to discuss this framework any further, please let me know.

AZ

Appendix 2

Letter from Industry



IBM Latin America
Route 9, Rockwood Road
Sleepy Hollow, NY 10591

Office of Raul Cosio
Vice President, Marketing
(914) 332-3080
Fax: (914) 332-3416

Monday, November 03, 1997

M. Lewis Temares, Ph.D.
Dean
University of Miami
College of Engineering
P.O. Box 248294
Coral Gables, FL 33124

NOV 10 1997

Dear Lew,

Working for the IBM Corporation for 22 years, the impact of information technology on our customers, suppliers and employees has never been more profound. Information technology is being integrated into the fabric of most any operation from simple ATM transactions at a bank to more complex business processes such as supply chain management.

I've reviewed the proposed program for a Bachelor of Science in Information Technology at the College of Engineering and fully endorse its implementation. The demand for I/T skills continues to grow as the globe is becoming more connected and interdependent. Graduating students with knowledge and experience in I/T will certainly be more valuable and require less of a learning curve when they leave the campus.

Congratulations for continuing to push for higher standards of excellence and academic achievement at the College of Engineering.

With best regards,

Raul Cosio
Vice President, Marketing
Latin America

RC/jmn

cc: Tad Foote
University of Miami
President



Computer Associates International, Inc.
One Computer Associates Plaza
Islandia, NY 11788-7000
1-516-DIAL CAI (342-5224)
FAX 1-516-DIAL FAX (342-5329)

DEC 9 1997

December 5, 1997

Mr. Lewis Temares
Dean, College of Engineering
University of Miami
P.O. Box 248294
Coral Gables, FL 33124-0620

DEC 11 1997
10005 TEL...

Dear Lew:

Thanks for giving us the chance to review your proposed new B.S. program in Information Technology. I know you're very aware of the serious shortage of qualified technical professionals we are facing in the IT industry at all levels, and your new program is right on the mark for creating graduates who will have both a sound engineering and computer science background, and also education in the practical application of modern information technology in the enterprise. Your new emphasis on networking, objects, Java programming, and managing a modern IT enterprise through agents will prepare your students to succeed.

As it happens, the timing of your new program may also open up some additional opportunities for the University. We have a new program here at Computer Associates called EduCAte, through which we are making available our software to institutions of higher learning free of charge, if it is to be used for educational purposes. Your curriculum seems both modern enough, and practical enough to qualify for this program. Students in your object database, application development, and your agent technology courses might benefit from the chance to see and work with our products as practical examples of the theory they are learning from your professors. With your permission, I'm forwarding your course descriptions to Ms. Jennifer Caputo-Schlactus here in Islandia, who is responsible for the EduCAte program. She will contact your office to follow up.

Lew, it was nice speaking with you again today, I hope you and yours enjoy a happy and safe holiday season.

Sincerely,

Mark A. Combs
Senior Vice President
Research and Development



NOV 24 1997

November 17, 1997

1798 NW 40th St.
Boca Raton, FL 33431

M. Lewis Temares, Ph.D
Dean
University of Miami
College of Engineering
P.O. Box 248294
Coral Gables, FL 33124-0620

Dear Dean:

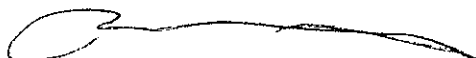
Thank you for the opportunity to review the Bachelors of Science in Information Technology proposal. I cannot emphasize enough its importance to industry, the competitiveness of the students and the continued success of the School of Engineering.

In industry the demand for information technology is unfulfilled and increasing at an incredible pace. Industry often compromises its sourcing of talent with candidates lacking the rigorous fundamentals that academia offers, this is typically due to the lack of available talent. The Information Technology program offers an outstanding platform targeted at today's real needs.

It is no accident that the proposal has such high merit. You have continuously sought the advice of us in industry and have set a course responsive to your customers needs. The program provides good coverage of the fundamental building blocks of Information Technology. It also provides the much needed hands-on experience through laboratory work. I especially appreciated the "Network Computing: The New Enterprise." Network Computing is the new enterprise. It is an unbelievable transformation every company is going through often lacking direction and expertise.

Because this is such a dynamic area, changing faster than courses can be developed, I would encourage supplementing the curriculum with periodic lectures from industry focusing on: technology developments, new applications, the changing business dynamics and the role of the engineer in the new culture. You should also consider good merchandising of this program early-on. This would put the spotlight on U.M. as a potential source of: talent, good co-op assignments and increased grants and research candidate.

Continued Success,


P. L. Martinez
Director
Worldwide Consulting
IBM Corporation

NOV 21 1997
M. LEWIS TEMARES

A FRAMEWORK FOR COORDINATION OF COMPUTER SCIENCE AND COMPUTER ENGINEERING PROGRAMS AND COURSES

The deans of Arts & Sciences and Engineering have agreed to this framework. The Provost has endorsed the framework, and agrees that if the two departments work within this framework, he has no objection to the filling of the vacant faculty lines as needed and approved by the deans. The framework is now being submitted for approval by the relevant faculty and chairs.

1. Use a common designation (CES or CSE) for all courses pertaining to computer science or computer engineering. The deans will ensure that tuition revenue by the two units are appropriately tracked and credited. Also, appropriate cross-listing of hardware courses (FEN) and mathematics courses that satisfy other degree requirements might be necessary. In that context, the content will need to be approved by the relevant faculty.
2. Appoint a committee made up of two faculty from each department (to be appointed by the two deans in consultation with the respective chairs) who, along with the respective chairs will jointly coordinate CS/CE curricula.
3. The degree programs continue to reside where they currently reside. Each CSE course is assigned a "home" department based on the nature of the content; software courses will be distributed equitably between the two departments. The content of a course that serves as a requirement to a degree that is in the other college will be determined by mutual agreement of the *relevant* faculty in the two departments, paying attention to national standards.
4. All qualified regular faculty in both departments may teach the CSE courses, but must adhere to the agreed upon syllabi. The course schedule for each semester will be prepared jointly by the two coordinating committee. Any disagreements will be referred to the two deans. The assignment of non-tenure track faculty to teach courses should be carefully monitored by both deans to assure high quality for the courses.
5. Both colleges will coordinate their recruitment efforts for the computing degree programs.
6. The two coordinating committee will make recommendations to the two deans regarding filling the vacant computing faculty lines.

A FRAMEWORK FOR COORDINATION OF COMPUTER SCIENCE AND COMPUTER ENGINEERING PROGRAMS AND COURSES

As amended by ECE Faculty at its meeting of Monday, Nov. 24, 1997

The deans of Arts & Sciences and Engineering have agreed to this framework. The Provost has endorsed the framework, and agrees that if the two departments work within this framework, he has no objection to the filling of the vacant faculty lines as needed and approved by the deans. The framework is now being submitted for approval by the relevant faculty and chairs.

1. Use a common designation (CES or CSE) for all courses pertaining to computer science or computer engineering. **However, all such courses should be cross-listed with the appropriate department.** In that context, the content will need to be approved by the relevant faculty. **To the extent that it becomes necessary,** the deans will ensure that tuition revenue by the two units are appropriately tracked and credited. ~~Also, appropriate cross-listing of hardware courses (EEN) and mathematics courses that satisfy other degree requirements might be necessary.~~
2. Appoint a committee made up of two faculty from each department (to be appointed by the two deans in consultation with the respective chairs) who, along with the respective chairs will jointly coordinate CS/CE ~~curricula.~~ **course schedule and course changes.**
3. The degree programs continue to reside where they currently reside. Each CSE course is assigned a "home" department based on the nature of the content; software courses will be distributed equitably between the two departments. The content of a course that serves as a requirement to a degree that is in the other college will be determined by mutual agreement of the relevant faculty in the two departments, paying attention to national standards ~~and relevant accreditation requirements.~~
4. All qualified regular faculty in both departments may teach the CSE courses, but must adhere to the agreed upon syllabi. The course schedule for each semester will be prepared jointly by the two-coordinating committee. Any disagreements will be referred to the two deans. The assignment of non-tenure-track ~~Doctorate~~ faculty to teach courses should be carefully monitored by both deans to assure high quality for the courses.
5. Both colleges will coordinate their student recruitment efforts for the computing degree programs.
6. The two-coordinating committee will make recommendations to the two deans regarding filling the vacant computing faculty lines. **respective Departments as to the most desired area needed to fill a vacancy.**

A FRAMEWORK FOR COORDINATION OF COMPUTER SCIENCE AND COMPUTER ENGINEERING PROGRAMS AND COURSES

As amended by ECE Faculty at its meeting of Monday, Nov. 24, 1997

The deans of Arts & Sciences and Engineering have agreed to this framework. The Provost has endorsed the framework, and agrees that if the two departments work within this framework, he has no objection to the filling of the vacant faculty lines as needed and approved by the deans.

1. Use a common designation (CES or CSE) for all courses pertaining to computer science or computer engineering. However, all such courses should be cross-listed with the appropriate department. In that context, the content will need to be approved by the relevant faculty. To the extent that it becomes necessary, the deans will ensure that tuition revenue by the two units are appropriately tracked and credited.
2. Appoint a committee made up of two faculty from each department (to be appointed by the two deans in consultation with the respective chairs) who, along with the respective chairs will jointly coordinate CS/CE course schedule and course changes.
3. The degree programs continue to reside where they currently reside. Each CSE course is assigned a "home" department based on the nature of the content; software courses will be distributed equitably between the two departments. The content of a course that serves as a requirement to a degree that is in the other college will be determined by mutual agreement of the relevant faculty in the two departments, paying attention to national standards and relevant accreditation requirements.
4. All qualified regular faculty in both departments may teach the CSE courses, but must adhere to the agreed upon syllabi. The course schedule for each semester will be prepared jointly by the coordinating committee. Any disagreements will be referred to the two deans. The assignment of non-Doctorate faculty to teach courses should be carefully monitored by both deans to assure high quality for the courses.
5. Both colleges will coordinate their student recruitment efforts for the computing degree programs.
6. The coordinating committee will make recommendations to the respective Departments as to the most desired area needed to fill a vacancy.

Bachelor of Science in Information Technology (First Reading)

Professor John Stewart, Chair of the Ad Hoc Review Committee, reported on the committee's investigation of the proposal for the Bachelor of Science in Information degree, and its subsequent approval. He mentioned that the proposal combines electrical engineering with basic computer courses, with a strong emphasis on the computer end. Deans Subbaswamy and Temares have discussed the details of the program. The Committee recommended approval of the program. It was suggested that before the second reading, a resolution of the remaining issues between Computer Engineering and Computer Science should be in place. If an impasse exists, a written document should be prepared for discussion with both deans at the Senate meeting. The second reading will be scheduled when the committee is ready. Professor Oxman asked for reaction to the proposal from the relevant faculty, not just the chairs.

It was suggested that when proposals are brought forward for Senate discussion in the future, the relevant faculty should be notified.

Report from the Distinguished Faculty Scholar Committee

Professors Frank Millero, former Distinguished Faculty Scholar, presented the Committee's report and recommendation that Professor J. Maxwell McKenzie, Chairman Emeritus of the Department of Medicine, be awarded the 1998 award. The Senate unanimously approved the recommendation.


Proposed Center for Research on Sports in Society

The Chair indicated that a request would be forthcoming from the College of Arts and Sciences for Senate approval of the name for a proposed Center for Research on Sports in Society. Professor Wilson explained that the *Faculty Manual* defines an Independent Center and an Institute or Sponsored Center. It appears that the proposed Center falls into the second category, Section B6.6, of the *Faculty Manual*. One Arts and Sciences Senator stated that most of the faculty of the College does not know of the existence of such a program and that the information should be circulated. Professor McKenry noted that the School of Education has a similarly named program and that any possible conflict should be considered. It was pointed out that the faculty of the College of Arts and Sciences need to approve the new Center, and that information about the Center should not have been distributed prior to the approvals of the faculty, Senate, and President.



FACULTY SENATE COMMITTEE REPORT
on the
Department of Electrical and Computer Engineering
Bachelor of Science in Information Technology Proposal

Respectfully submitted
January 13, 1998
by

Dr. John F. Stewart 
Computer Information Systems Department
Chairman

Dr. Deborah Mash
Department of Neurology

Dr. Victor Milenkovic
Department of Mathematics and Computer Science

Dr. Michael Sacks
Department of Biomedical Engineering

1. RECOMMENDATION: The Committee is pleased to recommend that the Faculty Senate approve the Bachelors in Science degree program in Information Technology (IT) submitted by the Department of Electrical and Computer Engineering (EEN). This recommendation is unanimous.
2. DISCUSSION: The Committee has reviewed the IT proposal submitted by EEN. Over the last several months, the proposal has undergone significant change based on recommendations made by Committee members. A copy of the most important sections of the final proposal are attached to this letter for your review.

In addition to considering the merits of the proposal, discussions were held with the Deans of Engineering, and Arts and Sciences, to try to coordinate the computer related offerings in the program with those of the Department of Mathematics and Computer Science (Math&CS). In the past there has been conflict between these two departments related to duplication of course offerings and faculty capabilities. A framework for an agreement to resolve these issues, proposed by Dean Swamy and based on a common course designation, has been accepted by the EEN and Math&CS faculties. Although it may take several months to work out all

the details, the Committee feels that it is reasonable to approve the proposal based on the promise that the parties involved will act in good faith to implement an agreement as soon as possible. Such an agreement will be a significant achievement for the University.

Some minor problems remain in the proposal, but solutions to these problems will be best found as the program begins to operate. Three letters from industry (attached) indicate that the program is right on target. The Society for Information Management has also informally endorsed the program.

There is some risk involved in implementing the EEN proposal. Since it is one of the first programs of its kind, there is no track record for similar programs at other institutions. Due to the popularity of the IT field, the risk seems small that the program would not attract sufficient students to be viable. It is also possible that the IT program would draw some students away from other computer related programs on this campus. This should be minimal as long as the three major computer departments on campus maintain their traditional focus: science in Math&CS, engineering in EEN, and business applications in Computer Information Systems.

The new program seeks to prepare students for positions in the IT field in which demand for technically trained people is high, and growing at a rapid pace. It should also give students a framework for keeping current in a field that is constantly changing. If it achieves these two objectives, it will be a valuable addition to the University curriculum.

The Committee recommends that EEN seek accreditation for the IT program at the earliest opportunity. Perhaps this could be done along with the School of Engineering's next reaccreditation in 2004.

The Committee also recommends that EEN consider offering technology update courses for graduates of the new program. These short courses could be offered via Internet, and would help graduates stay current in the field as well as providing an additional source of revenue for the program.

Finally, the Committee recommends that EEN pay attention to keeping the program in tune with the needs of industry. An Industry Advisory Board could provide a forum for this very important activity.

UNIVERSITY OF MIAMI

Bachelors of Science in

**Information
Technology**

at

**Department of Electrical and
Computer Engineering**

College of Engineering

Bachelors of Science in Information Technology

1. Objectives

Today's dynamic and complex computing environment requires Information Technologists with hands-on experience in a variety of aspects of information technology. Individuals are now needed who are aware of design practices and tools, innovations, technical aspects of key technologies and system integration. Areas include Internet and Intranets, object-oriented modeling and design, agent technology, network computing, multimedia and enterprise solutions. Such individuals are in great demand but in short supply. By 2005, over one million new jobs will be created in information technology alone [America's New Deficit: The shortage of Information Technology Workers]. The Information Technology (IT) program at the College of Engineering, University of Miami will train students in state-of-the-art technologies required for a successful career in the areas of computer networks, network computing, communications, information modeling and information processing in the 21st century market place. The Information Technology (IT) program integrates these key technologies and provides students with the hands on experience necessary to meet 21st century challenges.

2. Introduction

Recent advancements in the world wide information infrastructure are dramatically changing our lives. This change is no less dramatic than that brought on by the printing press invented in the fifteenth century first initiated by Johann Gutenberg¹. Whereas it took centuries for mankind to fully benefit from this new technology, information technology has penetrated our lives within two decades. Information technology includes computers, computer networks, phone systems, satellite and broadcast media. These media of communication are universally available – day and night at our homes and at work, whenever and wherever they are needed. The modern technology infrastructure is able to handle a variety of information including text, graphics, audio and video, data and knowledge.

The modern information infrastructure provides us with easy access to distributed and heterogeneous information and services (related to shopping, entertainment, education, healthcare, law, politics, etc.). It also supports collaborative work among individuals from different organizations with different interests, different cultures and different abilities. These technologies also affect the way we deliver and receive education, electronic commerce, and healthcare records among other aspects of human society.

Information technology is radically altering the way software systems are developed and deployed to achieve a competitive advantage and survival for corporations. It changes the economics and possibilities of application development and its delivery. The rapidity and broad requirement for critical information has significantly expanded their Information Systems departments. Furthermore, easy access and manipulation of information has made many small businesses appear and survive relying heavily on

¹ The Gutenberg Bible was published at Mainz, France, by local printer Johann Gutenberg, 56, is a Vulgate bible that marks one of the earliest examples of printing from movable type in Europe in 1456. Gutenberg took 5 years to produce the bible, printing it in two volumes, folio, with two columns of 42 lines each per page.

the modern information infrastructure. These factors have created a significant number of job opportunities for information technologists.

Consequently, a large force of skilled graduates will be needed who are aware of a variety of aspects of information technology including techniques for encoding, storage, communication, manipulation and use of information in digital form.

2.1 Distinguishing Aspects of Program

Information Technology differs significantly from typical Computer Engineering and Science (CES) programs. In addition to computing, Information Technology places emphasis on computer connectivity, communication, system integration, interactive multimedia design, network computing, agent technology, information modeling, information processing, high performance computing, and technology deployment. It encompasses the full range of human communications including animation, simulation, virtual reality, video and sound. In the area of telecommunications, it places a new emphasis on broad bandwidth communication to establish a richer interface between humans and information.

2.2 Information Technology Education

The information technology education offered by this program will go beyond that of being a means of transferring technical education to students. It will provide them with tools that will enable them to discover, formulate and then solve real life problems that enterprises face.

The nature of complex problems in modern organizations requires an information technologist to systematically analyze problem areas to determine the most efficient cost-effective solutions. The overall design of the curriculum, and teaching methodologies will be geared towards building student skills in two related areas: Analysis of requirements and group problem solving in an information technology society. The students will gain the capability of solving real life challenges based on their understanding of Object Oriented analysis techniques, and experience in solving real life problems through group interactions. (See Appendix 2: Letter from Industry)

The program also includes a background in mathematics, physics, and humanities, and social sciences, some knowledge in Electrical Engineering (i.e. telecommunications and digital signal processing), and experience in design. A broad background in science and engineering will enable students to understand the "big picture" of information technology infrastructure and help them adapt to future developments in the field.

3. IT Program at College of Engineering, UM

3.1 Exact Title of Degree

Bachelor of Science in Information Technology.

3.2 Assessment of Demand and Job Market

There is a great demand for individuals with a broad knowledge of modern information technologies. The market place has shown the necessity for this program with the placement of computer engineers and computer scientists and the high salaries companies are willing to pay to attract quality individuals. Further enhancements in information technologies are expected to further proliferate information

technologies into the general society requiring more trained personnel to maintain and handle related infrastructure.

Information technology positions are found in government, business, and industry at all levels. Presently, there are the well defined positions of systems analyst, programmer, network manager, computer technologist, systems integrator, multimedia developer, facilities manager, and database administrator. Graduates of the program will be capable of providing the organization with the skills necessary for the day to day operation of computing infrastructure. Their knowledge and experience in interactive media, telecommunications, and interface design will make them especially valuable.

3.2.1 Survey of the Job Market

The range of areas covered by Information Technology program include telecommunications, interactive multimedia design, information storage and organization, computer-human interaction, microcomputers, and computer programming. Each of these areas has shown tremendous growth, and the trends indicate that the growth will continue in the future. It is estimated that the combined corporate network computing market will jump from \$12 billion in 1995 to \$208 billion by the year 2000². The Bureau of Labor Statistics', 1996-1997 *Occupational Outlook Handbook*³ lists information, computer and network related jobs as the fastest growing occupations at the Bachelor's level. It also lists some of these jobs as having the largest numerical increase in employment during the period 1994-2005. The IEEE U.S. Membership Salary and Fringe Benefit Survey (1995) declares the jobs in related areas as the best paid⁴. Since, graduates of the program will have a broader range of expertise covering several aspects of the jobs included in these surveys, we anticipate even better opportunities for them.

3.3 Resources: Laboratories

1. Network Computing Laboratory (New)
2. Multimedia Laboratory (Arnold Center for Confluent Media Studies)
3. Software Engineering Laboratory
4. Telecommunication and Networking Laboratory
5. Microprocessor Laboratory
6. Image Processing Laboratory
7. Digital Signal Processing Laboratory

3.4 Budget Analysis

The estimated enrollment in the fourth year is 50. The budget needs include salaries and fringe benefits to two new faculty (Assistant/Associate Professor level), a part-time staff member and two teaching assistants, phased in over four years.

² Estimates by a research firm in Mountain View, California.

³ <http://stats.bls.gov/oco/ocotjt1.htm>

⁴ The highest median incomes were reported by engineers in communications (\$70,138), and computers (\$69,929): 1995 IEEE U.S. Membership Salary and Fringe Benefit Survey

Table 1: Budget Analysis in 1997 Dollars

Budget Year	1998-99	1999-00	2000-01	2001-02	2002-03
Revenue					
Estimated Enrollment	10	23	36	50	50
Tuition generated	\$180,000	\$414,000	\$648,000	\$900,000	\$900,000
Financial Aid (27%)	\$48,600	\$111,780	\$174,960	\$243,000	\$243,000
<i>Net Revenue</i>	\$131,400	\$302,220	\$473,040	\$657,000	\$657,000
Expenses					
Faculty (Salary & FB)		\$90,000	\$90,000	\$180,000	\$180,000
Part-time staff (Salary & FB)			\$15,000	\$15,000	\$15,000
Teaching assistants (Inc. Tuition)		\$24,000	\$24,000	\$48,000	\$48,000
Equipment & Operating Costs	\$10,000	\$20,000	\$30,000	\$30,000	\$30,000
<i>Total Expenses</i>	\$10,000	\$134,000	\$159,000	\$273,000	\$273,000
ECE Costs/Net Revenue	7.6%	44.3%	33.6%	41.6%	41.6%

4. Faculty

Name

Dr. Mansur R. Kabuka

Dr. John W. Collins

Dr. Christos Douligeris

Dr. Philip S. Liu

Dr. Moiez A. Tapia

Dr. Saeed A. Rajput

Dr. Michael S. Scordilis

Dr. Tzay Y. Young

Specializations

Information Technology and Medical Informatics

Object Oriented Programming and Artificial Intelligence

Telecommunications and Computer Networks

VLI Design, Computer Architecture, and Object Oriented Programming

Fault Tolerance, and Object Oriented languages.

Information Integration, Telecommunications, and Software Engineering

Digital Signal and Speech Processing

Computer Vision, Image Processing and Pattern Recognition

We have the assurance of the administration that we have two faculty lines in information technology. We plan to recruit additional faculty members in the area of information technology when the enrollment reach the target as proposed.

The departments of Mathematics / Computer Science and Electrical and Computer Engineering have worked with their respective deans to develop a joint relationship. There will be a joint coordinating committee as stated in the draft agreement attached (Appendix 1). Thus, the IT students will have access to both CE and CS faculty, and to an expanded selection of courses.

5. New Courses⁵

In the following sections we provide detailed description of each new course.

EEN 400: Internet & Intranet: JAVA Computing

Object Oriented modeling concepts. Introduction to JAVA language. JAVA constructs and exceptions. Building and constructing JAVA applets. Java Tools: compiler, applet viewer and debugger. JAVA classes, JAVA graphical user interfaces, JAVA networking.

EEN 470: Object Oriented Windows

Introduction to message driven windows. Windows programming techniques and components including resource, device context, controls, and serializable objects. Document/view objects architecture, multitasking and object sharing.

EEN 540: Speech and Audio Processing

Introduction to speech production, hearing and perception, speech and audio signal analysis in time and frequency, speech and audio coding, speech synthesis and recognition, speaker recognition, language modeling and design of systems for human-machine spoken communication.

EEN 570: Network Client-Server Programming

Introduction to server-client systems. Internet server-client communication programming. Advanced server-client design and implementation based on distributed component object model in Windows, Unix, and VMS.

EEN 571: Interactive Multimedia Computing

Interactive multimedia technologies include hardware, software, standards, concepts and issues. Compression, Decompression, user interface design, query by content, multimedia indexing, and distributed multimedia.

EEN 572: Distributed Systems and Object Oriented Database Management

Object-Oriented modeling concepts in languages and database systems. Object Oriented database systems. Semantic data models, nested-relational object-relational databases. Distributed database system. Federated Databases. Application to engineering design problems.

EEN 573: Network Computing: The New Enterprise

Enterprise's Internet and Intranet architecture: scalability, language independence, and high availability. High performance computing: clustering and performance analysis. Integration through standards: object management model, reference object model, and IDL language. Directory services, Security: symmetric and public cryptography.

EEN 574: Agents Technology

Agent definition and applications, modeling and theories, representation (KIF), behavior, ethical and emotional agents, communication languages (KQML), development environments and tools, systems (Cooperative agents, Interface agents, Information agents, learning agents, believable agents, agents for workgroups, mobile agents), and case studies (Internet spiders, softbots, workflow robots, knowbots).

⁵ As noted in the draft agreement (Appendix 1), a common designation, CES, for courses in CE and CS will be implemented.

6. Curriculum

Bachelor of Science in Information Technology

A. General

	Course Title		Credits
	Social Sciences/Humanities Electives		18
ENG 105	English Composition		3
ENG 107	Scientific Writing		3
MTH 110	Calculus I		5
xxx 111	Introduction to Engineering I		3
xxx 112	Introduction to Engineering II	Pre: xxx 111	2
MTH 112	Calculus II	Pre: MTH 110 or 111	4
PHY 205	University Physics I	Pre: MTH 110, 111 or 131	3
PHY 207	University Physics III	Pre: PHY 205, MTH 112 or 132	3
PHY 209	University Physics III Lab	Pre or Co: PHY 207	1
MTH 210	Vectors and Matrices	Pre: MTH 112 or 132	3
	Subtotal		48

B. Required Courses

	Course Title		Credits
EEN 118/ MTH120	Introduction to C and Software Engineering		3
EEN 201	Electrical Circuit Theory	Pre or Co: MTH 112	3
EEN 304	Logic Design		3
EEN 307	Linear Circuit & Signals	Pre: EEN 201	3
MTH 309	Discrete Mathematics I		3
IBN 311	Applied Probability and Statistics	Pre or Co: MTH 112 or 132	3
EEN 312	Microprocessor	Pre: EEN 304	4
EEN 315	Digital Design Lab	Pre: EEN 304	1
EEN 317/ MTH 220	Algorithm and Data Structure in C++	Pre: EEN 118/MTH 120	3
EEN 400*	Internet & Intranet: JAVA Computing	Pre: EEN 317/MTH 220	3
EEN 404	Communication Systems	Pre: EEN 307	3
EEN 414	Computer Organization and Design	Pre: EEN 304	3
EEN 424*	UNIX Systems and Servers	Pre: EEN 317/MTH 220	3
EEN 436	Digital Signal Processing (DSP): Multimedia Approach	Pre: EEN 307	3

EEN 512	Object-Oriented Software Engineering	Pre: EEN 317/MTH 220	3
CIS 520	Analysis of Information Systems		3
EEN 523/ MTH 523	Principles of Database Systems	Pre: EEN 317/MTH 220	3
CIS 524	Design of Information Systems	Pre: CIS 520	3
EEN 534	Computer Communication Networks	Pre: EEN 312 and IEN 311	3
EEN 570*	Network Client-Server Programming	Pre: EEN 317/MTH 220	3
EEN 571*	Interactive Multimedia Computing	Pre: EEN 523/MTH 523	3
EEN 572*	Distributed Systems & Object-Oriented Database Management	Pre: EEN 523/MTH 523	3
EEN 573*	Network Computing: The New Enterprise	Pre: EEN 571 and EEN 572	3
	Subtotal		68

C. Electives (Select Three Courses)

	Course Title		Credits
EEN 470*	Object Oriented Windows	Pre: EEN 317/MTH 220	3
EEN 514	Computer Architecture	Pre: EEN 414	3
MTH 517	Data Structures and Algorithm Analysis	Pre: MTH 112, 220, and 309	3
EEN 519/ MTH 519	Programming Languages	Pre: EEN 317	3
MTH 529	Introduction to Computer Graphics	Pre: MTH 517	3
EEN 537/ MTH 545	Artificial Intelligence	Pre: EEN 317/MTH 220	3
EEN 538	Introduction to Digital Image Processing	Pre: MTH 210 and EEN 307	3
EEN 540*	Speech and Audio Processing	Pre: EEN 436	3
CIS 540	Telecommunications: Introduction and Fundamentals		3
MTH 544	Computer Modeling	Pre: MTH 224 (IEN 311) and MTH 517	3
EEN 546	Reliable Digital System Design	Pre: EEN 304 and EEN 315	3
EEN 548	Machine Learning	Pre: EEN 317/MTH 220	3
EEN 553	Neural Networks	Pre: IEN 311	3
EEN 574*	Agents Technology	Pre: EEN 537/MTH 545	3
	Subtotal		9

D. Senior Project

Senior Project	3
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Grand Total = 128 credits

7. Semester by Semester Table

Bachelor of Science in Information Technology

FRESHMAN YEAR

FIRST SEMESTER

MTH 110 Analytic Geometry & Calculus I	5
ENG 105 English Composition I	3
xxx 111 Introduction to Engineering I	3
EEN 118/ Introduction to C and Software	3
MTH120 Engineering	
Socio-Humanistic Elective	3

SECOND SEMESTER

MTH 112 Calculus II	4
PHY 205 University Physics I	3
ENG 107 Writing about Science	3
xxx 112 Introduction to Engineering II	2
Socio-Humanistic Elective	3
EEN 304 Logic Design	3

17

18

SOPHOMORE YEAR

FIRST SEMESTER

EEN 201 Electrical Circuit Theory	3
PHY 207 University Physics III	3
PHY 209 University Physics III Lab	1
MTH 309 Discrete Mathematics I	3
EEN 317/ Algorithms and Data	3
MTH 220 Structure in C++	
EEN 315 Digital Design Lab	1
Socio-Humanistic Elective	3

17

16

JUNIOR YEAR

FIRST SEMESTER

EEN 436 Int. to Digital Signal Processing	3
EEN 414 Computer Organizat. & Design	3
CIS 520 Analysis of Information Syst.	3
EEN 570 Network Client-Server Prog.	3
EEN 523 Princ. of Database Systems	3
Adv. Socio-Humanistic Elective	3

18

15

SECOND SEMESTER

EEN 404 Communication Systems	3
EEN 424 Unix Systems & Servers	3
EEN 512 Object-Oriented Software Eng.	3
CIS 524 Design of Information Systems	3
Socio-Humanistic Elective	3

SENIOR YEAR

FIRST SEMESTER

EEN 572 Distributed Systems & Object-Oriented Database Mgmt.	3
EEN 571 Interactive Multimedia Comp	3
EEN 534 Computer Comm. Networks	3
Elective	3
Elective	3

15

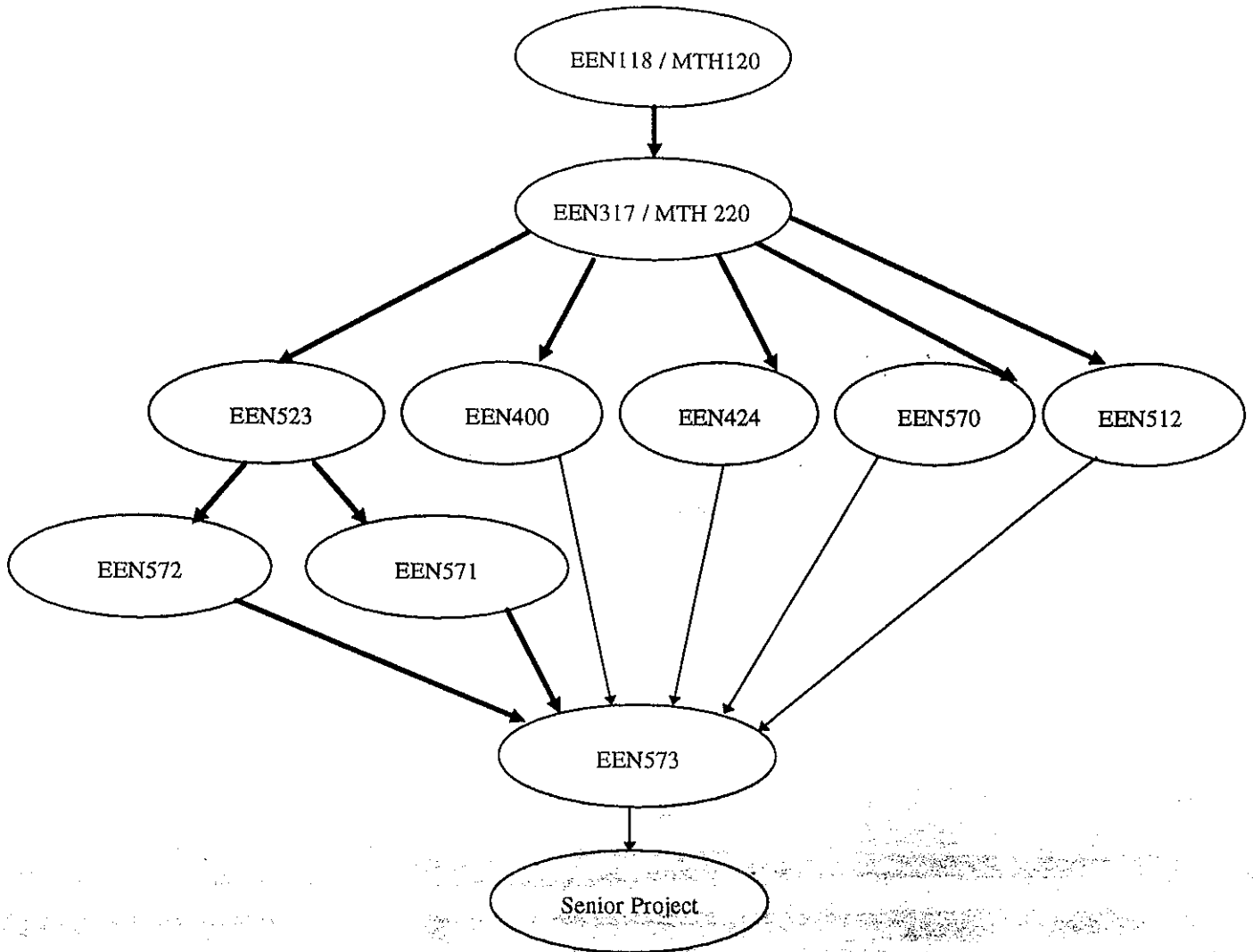
SECOND SEMESTER

EEN 573 Network Computing: The New Enterprise	3
Elective	3
Senior Project	3
Adv. Socio-Humanistic	3

12

Grand Total = 128 credits

8. Information Technology Core Courses



- EEN118 / MTH120 Introduction to C and Software Engineering
- EEN317 / MTH220 Engineering Data Structure in C++ Pre EEN118 / MTH120
- EEN400* Internet & Intranet: Java Computing Pre EEN317 / MTH220
- EEN424* Unix Systems and Servers Pre EEN317/MTH220
- EEN523 / MTH523 Principles of Database Systems Pre EEN317/MTH220
- EEN570* Network Client-Server Programming Pre EEN317/MTH220
- EEN 512 Object-Oriented Software Engineering Pre: EEN 317/MTH 220
- EEN572* Distributed Systems and Object-Oriented Database Management Pre EEN523
- EEN571* Interactive Multimedia Computing Pre EEN523
- EEN573* Network Computing: The New Enterprise Pre EEN571 and EEN572

* New Courses

9. Information Technology Options

Examples

Machine Intelligence

EEN 537/MTH 545	Artificial Intelligence
EEN 553	Neural Networks
EEN 548	Machine Learning
EEN 574	Agent Technology

Multimedia

EEN 538	Introduction to Digital Image Processing
EEN 571	Interactive Multimedia Computing
MTH 529	Introduction to Computer Graphics
EEN 540	Speech and Audio Processing

Others

Appendix 1

A Framework of Computer Science and Computer Engineering Programs and Courses

Return-path: <azame@bellsouth.net>
Date: Thu, 11 Dec 1997 17:04:03 -0500
From: Alan Zame <azame@bellsouth.net>
Subject: cs/ce framework
To: swamy@miami.edu
Organization: University of Miami

We have approved the version of the framework that follows. There are some differences with engineering's version, and an additional section. We feel very strongly that the common designation must be "CSE". In fact, Stewart himself objected to the CES designation for, if nothing else, being too much like "CIS".

1. Use the common designation CSE for all courses pertaining to computer science or computer engineering. The catalog will list all CSE course in a single location along with descriptions of the CS and CE programs and a list of faculty who have taught or teach these courses. To the extent that it becomes necessary, the deans will ensure that tuition revenue by the two units are appropriately tracked and credited.
2. Appoint a committee made up of two faculty from each department (to be appointed by the two deans in consultation with the respective chairs) who, along with the respective chairs will jointly coordinate CS/CE course schedule and course changes.
3. The degree programs continue to reside where they currently reside. Each CSE course is assigned a "home" department based on the nature of the content; CSE courses will be distributed equitably between the two departments. The content of a course that serves as a requirement to a degree that is in the other college will be determined by mutual agreement of the relevant faculty in the two departments, paying attention to national standards and relevant accreditation requirements.
4. All qualified regular faculty in both departments may teach the CSE courses, but must adhere to the agreed upon syllabi. The course schedule for each semester will be prepared jointly by the coordinating committee. Any disagreements will be referred to the two deans. The assignment of non-tenure track faculty to teach courses should be carefully monitored by both deans to assure high quality for the courses.
5. Both colleges will coordinate their student recruitment efforts for the computing degree programs.
6. The coordinating committee will make recommendations to the respective departments as to the most desired area needed to fill a vacancy.
7. The CSE designation and the coordination of course should in all cases be designed to strengthen the two departments' separate missions: teaching science, and teaching engineering. For the sake of enrollment and the image of the university, science students should not be forced, nor should they even have the perception that they are being forced, to study engineering solely for reasons of economy, and vice versa.

If you have any problems with this, or if you otherwise feel we need to discuss this framework any further, please let me know.

AZ

Appendix 2

Letter from Industry



IBM Latin America
Route 9, Rockwood Road
Sleepy Hollow, NY 10591

Office of Raul Cosio
Vice President, Marketing
(914) 332-3080
Fax: (914) 332-3416

Monday, November 03, 1997

M. Lewis Temares, Ph.D.
Dean
University of Miami
College of Engineering
P.O. Box 248294
Coral Gables, FL 33124

NOV 10 1997

Dear Lew,

Working for the IBM Corporation for 22 years, the impact of information technology on our customers, suppliers and employees has never been more profound. Information technology is being integrated into the fabric of most any operation from simple ATM transactions at a bank to more complex business processes such as supply chain management.

I've reviewed the proposed program for a Bachelor of Science in Information Technology at the College of Engineering and fully endorse its implementation. The demand for I/T skills continues to grow as the globe is becoming more connected and interdependent. Graduating students with knowledge and experience in I/T will certainly be more valuable and require less of a learning curve when they leave the campus.

Congratulations for continuing to push for higher standards of excellence and academic achievement at the College of Engineering.

With best regards,

Raul Cosio
Vice President, Marketing
Latin America

RC/jmn

cc: Tad Foote

University of Miami
President



Computer Associates International, Inc.
One Computer Associates Plaza
Islandia, NY 11788-7000
1-516-DIAL CAI (342-5224)
FAX 1-516-DIAL FAX (342-5329)

December 5, 1997

Mr. Lewis Temares
Dean, College of Engineering
University of Miami
P.O. Box 248294
Coral Gables, FL 33124-0620

Dear Lew:

Thanks for giving us the chance to review your proposed new B.S. program in Information Technology. I know you're very aware of the serious shortage of qualified technical professionals we are facing in the IT industry at all levels, and your new program is right on the mark for creating graduates who will have both a sound engineering and computer science background, and also education in the practical application of modern information technology in the enterprise. Your new emphasis on networking, objects, Java programming, and managing a modern IT enterprise through agents will prepare your students to succeed.

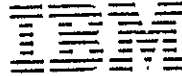
As it happens, the timing of your new program may also open up some additional opportunities for the University. We have a new program here at Computer Associates called EduCAte, through which we are making available our software to institutions of higher learning free of charge, if it is to be used for educational purposes. Your curriculum seems both modern enough, and practical enough to qualify for this program. Students in your object database, application development, and your agent technology courses might benefit from the chance to see and work with our products as practical examples of the theory they are learning from your professors. With your permission, I'm forwarding your course descriptions to Ms. Jennifer Caputo-Schlactus here in Islandia, who is responsible for the EduCAte program. She will contact your office to follow up.

Lew, it was nice speaking with you again today, I hope you and yours enjoy a happy and safe holiday season.

Sincerely,

A handwritten signature in dark ink, appearing to read "Mark A. Combs", is written over a light-colored background.

Mark A. Combs
Senior Vice President
Research and Development



NOV 24 1997

November 17, 1997

1798 NW 10th St.
Boca Raton, FL 33431

M. Lewis Temares, Ph.D
Dean
University of Miami
College of Engineering
P.O. Box 248294
Coral Gables, FL 33124-0620

Dear Dean:


Thank you for the opportunity to review the Bachelors of Science in Information Technology proposal. I cannot emphasize enough its importance to industry, the competitiveness of the students and the continued success of the School of Engineering.

In industry the demand for information technology is unfulfilled and increasing at an incredible pace. Industry often compromises its sourcing of talent with candidates lacking the rigorous fundamentals that academia offers, this is typically due to the lack of available talent. The Information Technology program offers an outstanding platform targeted at today's real needs.

It is no accident that the proposal has such high merit. You have continuously sought the advice of us in industry and have set a course responsive to your customers needs. The program provides good coverage of the fundamental building blocks of Information Technology. It also provides the much needed hands-on experience through laboratory work. I especially appreciated the "Network Computing: The New Enterprise." Network Computing is the new enterprise. It is an unbelievable transformation every company is going through often lacking direction and expertise.

Because this is such a dynamic area, changing faster than courses can be developed, I would encourage supplementing the curriculum with periodic lectures from industry focusing on: technology developments, new applications, the changing business dynamics and the role of the engineer in the new culture. You should also consider good merchandising of this program early-on. This would put the spotlight on U.M. as a potential source of: talent, good co-op assignments and increased grants and research candidate.

Continued Success,


P. L. Martinez
Director
Worldwide Consulting
IBM Corporation

NOV 24 1997


M. LEWIS TEMARES



MEMORANDUM

January 13, 1998

To: Faculty Senate

From: Tzay Y. Young 
Chair, Dept. of Electrical & Computer Engineering

Subject: Information Technology Proposal

Attached is a copy of a proposal for a Bachelor of Science Program in Information Technology. Brief resumes of the faculty involved are included in the attached proposal.

Thank you.

TYT/mp

Attachment

Department of Electrical and Computer Engineering
P.O. Box 248294
Coral Gables, Florida 33124-0640
Phone: 305-284-3291
Fax: 305-284-4044
E-mail: ece@eng.miami.edu



*New Appendix 1
BS in IT proposal
12/5/97*

MEMORANDUM

December 5, 1997

To: Dr. John Stewart
Chair, Faculty Senate Committee on the IT Proposal

From: Dr. Tzay Y. Young *Tzay Y. Young*
Chair, Department of Electrical & Computer Engineering

Subject: Amended Version of "A Framework for Coordination of CS and CE Programs and Courses"

Attached is a copy of "A framework for coordination of CS and CE Programs and Courses", as amended by ECE faculty at its meeting of Monday, November 24, 1997.

The amendment are mostly minor changes and clarifications of the original framework which was proposed by Dean Subbaswamy of the College of Arts and Sciences. The amended framework was approved by the ECE faculty at the November meeting. Please include it in Appendix 1 of the revised IT proposal.

Thank you for your cooperation.

TYY/mp

Attachment

cc: Dean Temares

Department of Electrical and Computer Engineering
P.O. Box 248294
Coral Gables, Florida 33124-0640
Phone: 305-284-3291
Fax: 305-284-4044
E-mail: ece@eng.miami.edu

A FRAMEWORK FOR COORDINATION OF COMPUTER SCIENCE AND COMPUTER ENGINEERING PROGRAMS AND COURSES

As amended by ECE Faculty at its meeting of Monday, Nov. 24, 1997

The deans of Arts & Sciences and Engineering have agreed to this framework. The Provost has endorsed the framework, and agrees that if the two departments work within this framework, he has no objection to the filling of the vacant faculty lines as needed and approved by the deans. ~~The framework is now being submitted for approval by the relevant faculty and chairs.~~

1. Use a common designation (CES or CSE) for all courses pertaining to computer science or computer engineering. **However, all such courses should be cross-listed with the appropriate department.** In that context, the content will need to be approved by the relevant faculty. **To the extent that it becomes necessary, the deans will ensure that tuition revenue by the two units are appropriately tracked and credited.** ~~Also, appropriate cross-listing of hardware courses (EEN) and mathematics courses that satisfy other degree requirements might be necessary.~~
2. Appoint a committee made up of two faculty from each department (to be appointed by the two deans in consultation with the respective chairs) who, along with the respective chairs will jointly coordinate CS/CE curricula: **course schedule and course changes.**
3. The degree programs continue to reside where they currently reside. Each CSE course is assigned a "home" department based on the nature of the content; software courses will be distributed equitably between the two departments. The content of a course that serves as a requirement to a degree that is in the other college will be determined by mutual agreement of the relevant faculty in the two departments, paying attention to national standards ~~and relevant accreditation requirements.~~
4. All qualified regular faculty in both departments may teach the CSE courses, but must adhere to the agreed upon syllabi. The course schedule for each semester will be prepared jointly by the ~~two~~ coordinating committee. Any disagreements will be referred to the two deans. The assignment of non-tenure track ~~Doctorate~~ faculty to teach courses should be carefully monitored by both deans to assure high quality for the courses.
5. Both colleges will coordinate their student recruitment efforts for the computing degree programs.
6. ~~The two~~ coordinating committee will make recommendations to the ~~two~~ deans regarding filling the vacant computing faculty lines: **respective Departments as to the most desired area needed to fill a vacancy.**

A FRAMEWORK FOR COORDINATION OF COMPUTER SCIENCE AND COMPUTER ENGINEERING PROGRAMS AND COURSES

As amended by ECE Faculty at its meeting of Monday, Nov. 24, 1997

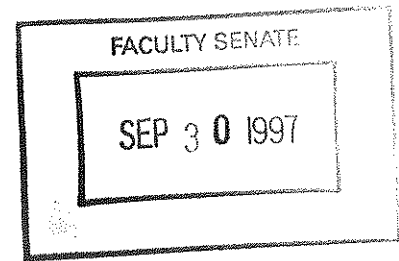
The deans of Arts & Sciences and Engineering have agreed to this framework. The Provost has endorsed the framework, and agrees that if the two departments work within this framework, he has no objection to the filling of the vacant faculty lines as needed and approved by the deans.

1. Use a common designation (CES or CSE) for all courses pertaining to computer science or computer engineering. However, all such courses should be cross-listed with the appropriate department. In that context, the content will need to be approved by the relevant faculty. To the extent that it becomes necessary, the deans will ensure that tuition revenue by the two units are appropriately tracked and credited.
2. Appoint a committee made up of two faculty from each department (to be appointed by the two deans in consultation with the respective chairs) who, along with the respective chairs will jointly coordinate CS/CE course schedule and course changes.
3. The degree programs continue to reside where they currently reside. Each CSE course is assigned a "home" department based on the nature of the content; software courses will be distributed equitably between the two departments. The content of a course that serves as a requirement to a degree that is in the other college will be determined by mutual agreement of the relevant faculty in the two departments, paying attention to national standards and relevant accreditation requirements.
4. All qualified regular faculty in both departments may teach the CSE courses, but must adhere to the agreed upon syllabi. The course schedule for each semester will be prepared jointly by the coordinating committee. Any disagreements will be referred to the two deans. The assignment of non-Doctorate faculty to teach courses should be carefully monitored by both deans to assure high quality for the courses.
5. Both colleges will coordinate their student recruitment efforts for the computing degree programs.
6. The coordinating committee will make recommendations to the respective Departments as to the most desired area needed to fill a vacancy.



MEMORANDUM

September 30, 1997



To: Dr. John F. Stewart
Chair, Faculty Senate Committee for Reviewing the
Information Technology Proposal

From: Dr. Tzay Y. Young *Tzay Y. Young*
Chair, Department of Electrical and Computer Engineering

cc: Dr. David L. Wilson
Chair, Faculty Senate
Dr. M. Lewis Temares
Dean, College of Engineering

Subject: Revised Proposal, Information Technology Program

Attached are five copies of a revised proposal for a new baccalaureate degree program, the Bachelor of Science in Information Technology.

The revisions were based on the comments and concerns of your committee, and include the following:

- o A paragraph on the objectives of the program at the beginning of the proposal
- o A new section on the design contents of the core courses in the program
- o A revised curriculum with the total number of credit hours increased from 122 to 128
- o A revised budget that starts at \$10,000 for the 1998-99 academic year and increases in steps to \$273,000 for 2001-02 and thereafter, all in 1997 dollars

We hope that with these revisions, the proposal will receive the Committee's endorsement and the Senate's approval. Thank you for your time and effort in reviewing this proposal.

Attachment
TYY/mp

Department of Electrical and Computer Engineering
P.O. Box 248294
Coral Gables, Florida 33124-0640
Phone: 305-284-3291
Fax: 305-284-4044
E-mail: ece@eng.miami.edu



MEMORANDUM

TO: Professors J. Stewart, V. Milenkovic, S. Snedaker, D. Mash and M. Sacks

FROM: Barbara L. Hoadley *BLH*
Secretary to the Faculty Senate

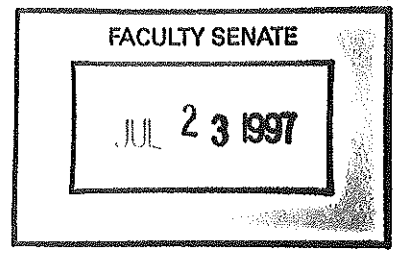
DATE: August 28, 1997

SUBJECT: Review of Proposed Bachelor of Science in Information Technology Degree

Attached is the proposal for a new baccalaureate degree program in the College of Engineering. Please review the proposal in preparation for your meeting scheduled for **Tuesday, September 2 at 4:00 p.m. in the Senate Conference Room, 325 Ashe**. I have also included a copy of the guidelines for the approval of new programs and changes in program titles.

BLH/s

Attachments



MEMORANDUM

DATE: July 18, 1997
TO: Dr. David L. Wilson, Chair, Faculty Senate
FROM: Dr. M. Lewis Temares, Dean, College of Engineering
RE: New Baccalaureate Degree Program

Handwritten signature of M. Lewis Temares

COLLEGE OF ENGINEERING



- 1947 - 1997
Creating 21st Century Leaders
Deans
M.L. Temares (94-)
M. Becker (90-94)
S.S. Lee (90-) (acting)
N.G. Einspruch (77-90)
H.P. Harrenstein (73-76)
J. Catz (72-75-77) (acting)
D.A. Sawyer (70-72) (acting)
W.C. Knopf (66-71)
T.A. Weyher (57-65)
J.H. Clouse (47-58)

Attached is a proposal for a new baccalaureate degree program in the College of Engineering, the Bachelor of Science in Information Technology. This proposal was approved unanimously by the Faculty of the College of Engineering on April 23, 1997.

I fully endorse this proposal, including the proposed annual budget on page 4 of the proposal. The annual budget starts at \$20,000 for the 1998-99 academic year and increases gradually to \$273,000 for 2002-03 and thereafter, all in 1997 dollars. Please initiate the process of Faculty Senate consideration of this new degree program.

The new Information Technology program is to be administered by the Department of Electrical and Computer Engineering. Please contact Dr. Tzay Young, the department chair, with any questions on the proposed degree program and/or requests for any additional materials. The chairs of the Department of Mathematics and Computer Science and the Department of Computer Informations Systems have received copies of the program. Thank you in advance for your efforts on our behalf.

MLT:fc
Attachment

- cc: Dr. Tzay Young, Chair, Dept. of Electrical and Computer Engineering
Dr. Samuel S. Lee, Associate Dean
Dr. Thomas D. Waite, Associate Dean, Research and Graduate Studies
Dr. Luis Glaser, Executive Vice President and Provost

College of Engineering
Office of the Dean
P.O. Box 248294
Coral Gables, Florida 33124-0620
305-284-2404
Fax: 305-284-3815
http://www.eng.miami.edu