ANNUAL REVIEW OF ACADEMIC PROGRAM CONTRACTS BETWEEN THE STATE BOARD OF EDUCATION AND FLORIDA INDEPENDENT POSTSECONDARY INSTITUTIONS

Report and Recommendations by the
Florida Postsecondary Education Planning Commission

August 1999

POSTSECONDARY EDUCATION PLANNING COMMISSION

The Postsecondary Education Planning Commission, initially created by executive order in 1980, given statutory authority in 1981 (ss 240.145 and 240.147, Florida Statutes), and reauthorized by the 1991 Legislature, serves as a citizen board to coordinate the efforts of postsecondary institutions and provide independent policy analyses and recommendations to the State Board of Education and the Legislature. The Commission is composed of 11 members of the general public and one full-time student registered at a postsecondary education institution in Florida. Members are appointed by the Governor with the approval of three members of the State Board of Education and subject to confirmation by the Senate.

A major responsibility of the Commission is preparing and updating every five years a master plan for postsecondary education. The enabling legislation provides that the Plan "shall include consideration of the promotion of quality, fundamental educational goals, programmatic access, needs for remedial education, regional and state economic development, international education programs, demographic patterns, student demand for programs, needs of particular subgroups of the population, implementation of innovative educational techniques and technology, and the requirements of the labor market. The capacity of existing programs, in both public and independent institutions, to respond to identified needs shall be evaluated and a plan shall be developed to respond efficiently to unmet needs."

Other responsibilities include recommending to the State Board of Education program contracts with independent institutions; advising the State Board regarding the need for and location of new programs, branch campuses and centers of public postsecondary education institutions; periodically reviewing the accountability processes and reports of the public and independent postsecondary sectors; reviewing public postsecondary education budget requests for compliance with the State Master Plan; and periodically conducting special studies, analyses, and evaluations related to specific postsecondary education issues and programs.

Further information about the Commission, its publications, meetings and other activities may be obtained from the Commission office, Turlington Building, Department of Education, Tallahassee, Florida, 32399-0400; telephone (850) 488-7894; FAX (850) 922-5388; Website - www.firn.edu/pepc

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EXECUTIVE SUMMARY

In accordance with the provisions of the State Board of Education Rule 6A-10.032, the Postsecondary Education Planning Commission has conducted an annual review of the academic programs which received contract funding from the State Board of Education in 1998-1999 to provide instruction to Florida residents at state tuition rates. This report provides a summary of the annual contract reviews. In the continuing cycle of five-year contract reviews, comprehensive reviews were conducted for the following programs: the B.S. in Science Education and Mathematics Education at the Florida Institute of Technology and the B.S. in Industrial Engineering at the University of Miami.

The Commission believes that all postsecondary education resources in the State must be utilized to meet the education needs of a rapidly growing state. Within the current fiscal realities facing public education in Florida, contracting with the state's independent postsecondary institutions can be a cost-efficient way to increase access for Florida residents to a postsecondary degree in fields in which graduates are in demand. Contract programs in such fields as biomedical engineering, nursing and social work are producing high quality graduates who are addressing local, regional and state workforce needs.

For the 1999-2000 academic year, the 1999 Legislature appropriated funds at the levels recommended by the Commission for the University of Miami contract programs, but failed to fund the contract programs at Barry University, the Florida Institute of Technology and Nova Southeastern University at the recommended levels.

The Commission's state academic contract funding recommendations by institution and academic program for the 2000-2001 academic year appear on the following page. These funding recommendations represent a continuing request to restore the level of student support for *all* of the existing contracts to the funding levels recommended by the Commission for the past 10 years. The report also includes a continuing recommendation to establish a state contract to support Bethune-Cookman College's Bachelor of Science program in Specific Learning Disabilities.

The Commission urges the full commitment of the Legislature to fund each of the existing contracts at the level of student support recommended in the report.

CONTRACT FUNDING RECOMMENDATIONS
2000-2001

	PEPC Funding Recommendation	Semester Credit Hours
FLORIDA INSTITUTE OF TECHNOLOGY		
BS/Engineering	$883,100	2000
BS/Science Education*	169,555	384
UNIVERSITY OF MIAMI		
BS/Industrial Engineering*	257,369	331
BS/Architectural Engineering	233,265	300
MS/Biomedical Engineering	176,112	250
BS/Nursing	622,040	800
MS/Nursing	419,148	595
Ph.D./Marine & Atmospheric Sciences	531,900	150
Ph.D./Biomedical Sciences	576,000	18 Students
BS/Motion Pictures	349,897	450
BS/Music Engineering Technology	349,897	450
BARRY UNIVERSITY		
BS/Nursing (Accelerated Option)	424,105	1,100
MSW/Social Work	421,807	1,350
BETHUNE COOKMAN COLLEGE		
BS/Specific Learning Disabilities	81,374	288
NOVA SOUTHEASTERN UNIVERSITY		
MS/Speech-Language Pathology	330,715	700
Osteopathy	3,139,000	365 Students
Pharmacy	884,000	260 Students
Optometry	1,048,025	131 Students
TOTAL	**$10,897,309**	

* FIVE-YEAR REVIEW

I. INTRODUCTION

Since authorized by the Legislature in 1975, the state of Florida has contracted with independent colleges and universities for Florida residents to participate at state tuition rates in carefully selected academic programs. In 1981, the Florida Legislature transferred authority from the Board of Regents to the State Board of Education "to contract with (accredited) independent institutions . . . for the provision of those educational programs and facilities which will meet needs unfulfilled by the state system of postsecondary education" (S.229.053 (2)(o), F.S.). The Postsecondary Education Planning Commission was assigned responsibility to "recommend to the State Board of Education contracts with independent institutions to conduct programs consistent with the state master plan for postsecondary education" (S.240.147(4), F.S.).

The authority for academic program contracts, according to State Board of Education Rule 6A-10.032, FAC.:

> *is based upon the principles of efficiency, effectiveness, and economy. The State Board may contract for a program or for the use of an existing facility if it can be demonstrated that the state need for the program or facility may be met at lower cost or more effectively through contracting. In all cases, the program or facility obtained through contract must be of equal quality as similar programs and facilities in the state system of postsecondary education.*

As envisioned in the 1982 ***Master Plan For Florida Postsecondary Education***, statute and rule, the contracting process is one manifestation of the recognition by the state of Florida that all postsecondary education resources must be utilized to meet the educational needs of a rapidly growing state. Florida's citizens are able to gain access to needed quality programs at competitive costs and at public tuition rates. The independent institutions involved in contracting benefit primarily from an increased pool of students who are better able, with state assistance, to afford to enter the selected contract programs. When the State enters a contract with an established academic program at an independent institution to provide a needed educational opportunity, it takes advantage of the institution's prior investment and avoids duplicative start-up costs. By design, the student may pay no more tuition under a contract than at a comparable public sector program.

In Challenges and Choices: The 1998 Master Plan for Florida Postsecondary Education, the Commission identifies responses to meet the future postsecondary access needs in our state. One response is the increased use of the independent sector. The ***Plan*** states: *"increase the state subsidy to in-state students attending Florida private institutions,"* and recognizes that the independent institutions could to be expected to serve about ten percent of the state's projected enrollment growth. The ***Plan*** also recommends funding strategies to provide support to Florida residents in the independent sector.

The Commission, in accordance with statute and rule, conducts a detailed evaluation of each proposal for a contract submitted by an independent institution prior to a recommendation to the State Board of Education. Historically, the Commission has recommended state support for an

academic program at a level that does not encourage over-dependence on State funds for its viability. For many contracts, the FTE funding level has stabilized at from 40 to 60 percent of the total program enrollment.

The cost of the contract is the total cost to the State for the program at the independent institution. In contrast, public sector operating cost data do not include significant capital outlay expenditures for facilities and major equipment purchases or other start-up costs which would be necessary to duplicate an existing independent sector program. Calculating cost comparisons between academic program contracts and similar public sector programs has been problematic, as there appears to be as much variation in program costs among similar programs at independent and public institutions as among such programs within the State University System.

Between 1988 and 1998, state support for the academic contracts steadily declined approximately 20 percent as the Legislature held the annual state appropriation for most of the contracts relatively constant, in effect, "rolling over" the previous year's dollar amount. The gradual erosion of the funding level has combined with increased tuition and program costs at the independent institutions to steadily reduce the number of students that are supported each year by the state contract. During this period, the level of student credit hour support stated in the specific legislative appropriation for each contract program has had no relation to the actual number of students served by the state dollars.

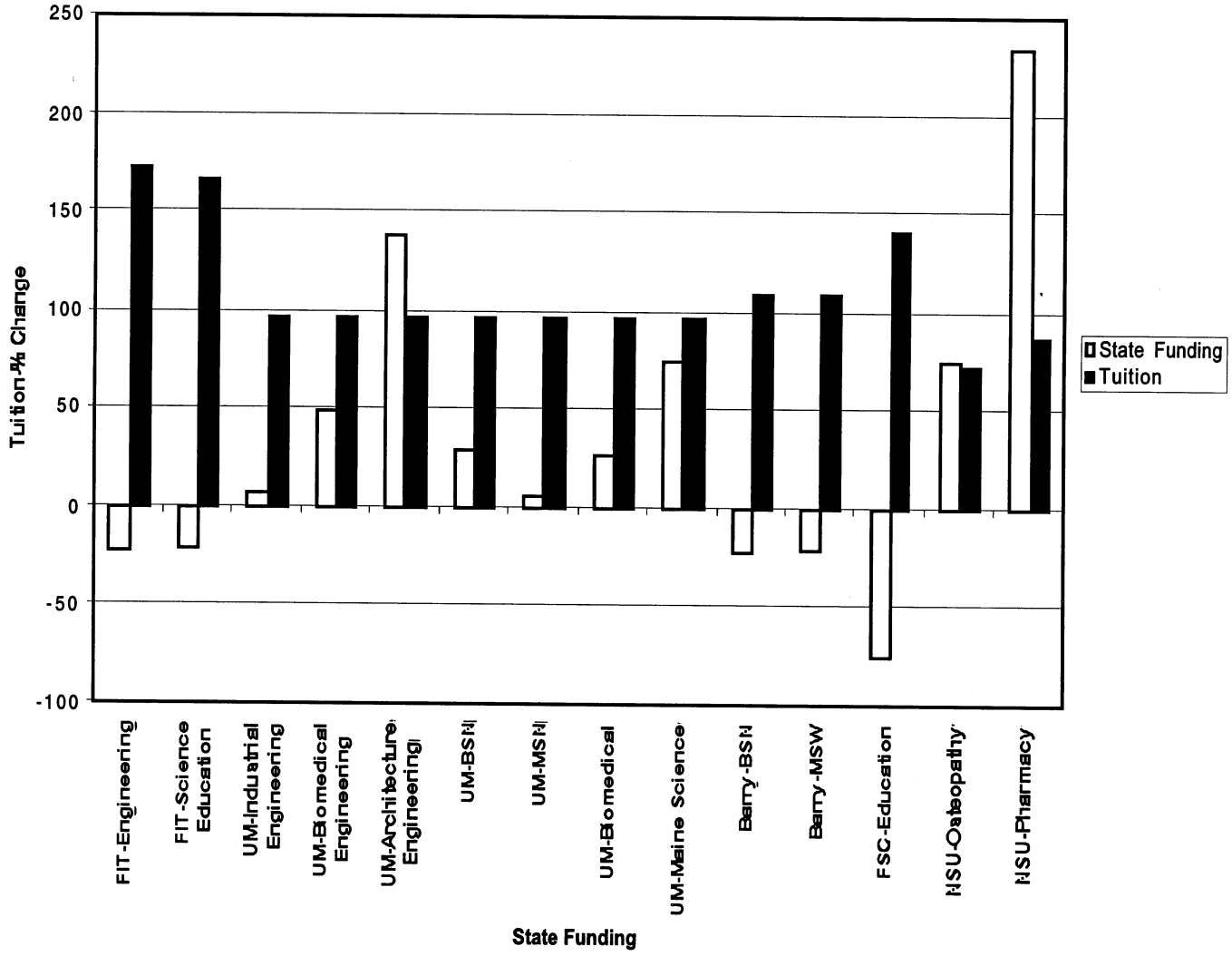
Table 1 displays tuition increases as well as the decline of state contract funding over a 10-year period for contract programs that were established by 1988. The disparity is most dramatic at the Florida Institute of Technology due to the university's 160 percent tuition increase since 1988. In addition, during the 1992-93 year, funding levels were reduced 6.6 percent for the contract programs due to across-the-board state budget reductions enacted by the Governor and Legislature.

TABLE 1

ACADEMIC CONTRACT INSTITUTIONS

State Funding and Tuition Costs

Percent Change: 1988-99



Program Diversity - The Commission continues to be committed to increase and broaden postsecondary opportunities for the state's minority students. Table 2 displays 1998-99 contract-supported students by program and ethnicity.

TABLE 2

CONTRACT-SUPPORTED STUDENTS BY ETHNICITY
1998-99

CONTRACT PROGRAM	ETHNICITY					
	Asian	Black	Hispanic	White	Other	Total
Florida Institute of Technology						
BS in Engineering	1	2	2	30	0	35
BS in Science Education	0	1	0	6	0	7
University of Miami						
BS in Industrial Engineering	0	2	15	2	0	19
BS in Architectural Engineering	0	3	9	2	0	14
MS in Biomedical Engineering	2	1	6	7	2	18
BS in Nursing	2	7	10	33	0	52
MS in Nursing	1	9	5	34	0	49
Ph.D. in Biomedical Sciences	0	1	2	13	0	16
Ph.D. in Marine & Atmospheric Sciences	0	0	1	20	0	21
BS in Motion Pictures	0	13	19	20	2	54
BS in Music Engineering	0	1	0	10	0	11
Barry University						
BS in Nursing (Accelerated Option)	0	3	5	14	0	22
MSW in Social Work	1	15	14	37	2	69
Nova Southeastern University						
Osteopathy	48	18	43	236	10	355
Pharmacy	46	19	81	171	0	317
Optometry	6	2	5	29	5	47
MS in Speech-Language Pathology	1	5	10	27	1	44
TOTAL	**108**	**102**	**227**	**691**	**22**	**1,150**

1999-2000: Uneven Legislative Appropriations

The Commission recommended state funding for 20 academic contracts for the 1999-2000 academic year. For the University of Miami contract programs, the 1999 Legislature appropriated funds at the levels recommended by the 1998 Commission. Additional funds were appropriated for the UM motion pictures contract program. For the contract programs at Florida Institute of Technology and Barry University, the Legislature funded the programs at the previous year's level. Contract programs at Nova Southeastern University were funded at near their recommended levels. The Legislature did not appropriate funds to establish a new contract for Bethune-Cookman College's Specific Learning Disabilities program, as was recommended by the Commission both in 1997 and 1998. The total appropriation for all of the contracts was nearly $1 million below the level recommended by the Commission. (See Table 3)

TABLE 3

STATE ACADEMIC CONTRACTS: 1999-2000
PEPC Recommendations and Legislative Appropriations

CONTRACTS	1998-99 FUNDING	PEPC RECOMMENDATION	LEGISLATIVE APPROPRIATION
FLORIDA INSTITUTE OF TECHNOLOGY			
BS/Engineering	$ 401,346	$ 921,600	$ 401,346
BS/Science Education	$ 86,787	$ 251,652	$ 86,787
UNIVERSITY OF MIAMI			
BS/Industrial (Manufacturing) Engineering	$ 182,082	$246,446	$ 246,446
BS/Architectural Engineering	$ 74,222	$223,365	$ 223,365
MS/Biomedical Engineering	$89,802	$ 168,735	$ 168,735
BS/Nursing	$ 331,091	$ 595,640	$ 595,640
MS/Nursing	$ 299,559	$ 401,589	$ 401,589
Ph.D./Biomedical Sciences	$ 362,228	$ 576,000	$ 576,000
Ph.D./Marine & Atmospheric Sciences	$ 289,430	$ 531,900	$ 531,900
BS/Motion Pictures	$ 320,634	$ 335,047	$ 763,400
BS/Music Engineering Technology	$200,000	$ 335,047	$ 335,047
BARRY UNIVERSITY			
BS/Nursing (Accelerated Option)	$ 189,989	$ 401,005	$ 189,989
MSW/Social Work	$ 193,734	$ 418,419	$ 193,734
FLORIDA SOUTHERN COLLEGE			
BS/BA/Elementary Education	$ 34,688	$ 44,660	$ 22,330
BS/Accounting	$ 30,540	$ 39,321	$ 19,658
NOVA SOUTHEASTERN UNIVERSITY			
Osteopathy	$ 3,133,900	$ 3,020,375	$ 3,133,900
Pharmacy	$ 838,244	$ 884,000	$ 838,244
Optometry	$ 969,400	$ 1,048,000	$ 969,400
MS/Speech-Language Pathology	$ 215,280	$335,958	$ 215,280
BETHUNE-COOKMAN COLLEGE			
BS/Specific Learning Disabilities	0	$ 76,190	0
TOTAL	$ 8,242,956	$ 10,854,949	$ 9,912,790

The 1999 Legislature spent considerable time in a review of state academic contracting for Florida's independent postsecondary institutions. In the General Appropriations Act for the 1999-2000 fiscal year, the Legislature added specificity to the funding appropriations for the academic contracts. For each contract program named in the 1999-2000 budget, the appropriation identifies a specific number of student credit hours that will be supported by the funding amount. Additionally, in the ***Private Colleges and Universities*** section of the Department of Education's budget, the Legislature provides direction to the independent institutions for the allocation of the contract funds to its students when it states that:

> *For academic program contracts recommended by the Postsecondary Education Planning Commission, priority for funding shall be placed on the most financially needy students.*

1998-1999 Annual Contract Review

This annual report consists of a brief display of summary information and data on each contract program for the 1998-99 academic year. Comprehensive five-year contract reviews were conducted for two existing contract programs: the Bachelor of Science in Science Education and Mathematics Education at the Florida Institute of Technology and the Bachelor of Science in Industrial Engineering at the University of Miami. The program reviews and funding recommendations of these two programs appear in Chapter II. Simultaneously, 15 academic contract programs received annual reviews and these reviews are summarized in Chapter III.

During 1997, Bethune-Cookman College's proposal to establish a contract for its baccalaureate program in Specific Learning Disabilities was approved by the Commission. Both in 1998 and 1999, however, the Legislature failed to appropriate funds to establish the contract. Chapter IV includes a brief summary of this program, as well as a funding recommendation to establish a state academic contract for the program.

II. FIVE-YEAR ACADEMIC CONTRACT REVIEWS

As required in statute, the five-year review of existing academic program contracts began in 1988. Five-year reviews are coordinated by the Department of Education's Office of Postsecondary Education Coordination with the support of Commission staff. The five-year review is a comprehensive study of the contract and is more rigorous than the annual review process. It is similar to the initial proposal evaluation conducted by the Commission before a contract is recommended to the State Board of Education for approval (See Appendix A).

In most cases, an external consultant with expertise in the specific discipline of the contract is retained to facilitate the review. A Review Team, typically consisting of the external consultant, Office of Postsecondary Education Coordination staff and Commission staff, reviews a five-year report on the contract program submitted by the contract administrator of the independent institution and visits the campus to tour the educational facilities and interview administrators, faculty and students. During this year, five-year reviews were conducted for the following contract programs:

A. FLORIDA INSTITUTE OF TECHNOLOGY - BS in Science Education and Math Education

B. UNIVERSITY OF MIAMI – BS in Industrial Engineering

The results of the five-year reviews and the Commission's recommendations regarding continued funding for the two contracts follow. The consultant reports appear in the Appendices.

A. FLORIDA INSTITUTE OF TECHNOLOGY - BS in Science Education

Introduction

A state academic contract for Florida Institute of Technology's Bachelor of Science programs in Science Education and Mathematics Education was established in 1983. The Florida Tech programs are unique in that they are offered by a major independent, technological university, are housed in the College of Science and Liberal Arts (as opposed to the College of Education) and are limited to the preparation of high school teachers. The state academic contract enhances opportunities for residents of East Central Florida to obtain a degree in science education or math education and addresses the ongoing critical need for math and science teachers in the State. Since the inception of the contract, the programs produced nearly 100 science and math teachers for Florida schools.

To assist in the five-year review of this academic contract, the Department of Education's Office of Postsecondary Coordination contracted with Dr. Jane Kahle, Condit Professor of Science Education at Ohio University. Dr. Kahle also assisted the Department in its 1989 and 1993 five-year contract reviews. During the 1993 review, Dr. Kahle found the contract program to be stronger than it was in 1989. She reported that the program was strongly deserving of the continuation of the state contract and recommended an increase in contract funding so that more students could be supported. Dr. Kahle's 1999 report appears in Appendix C.

Science Education/Math Education in Florida

The Department of Education's Office of Postsecondary Coordination reports that there are eight state universities and seven independent postsecondary institutions that offer baccalaureate degrees in mathematics education and eight state universities and four independent institutions that offer degrees in science education.

Undergraduate headcount enrollment of state university programs provided by the Board of Regents reveal a steady decline during most of this decade. See Table 1.

TABLE 1

HEADCOUNT ENROLLMENT - UNDERGRADUATE DEGREE PROGRAMS
STATE UNIVERSITY SYSTEM

Year	Mathematics Education	Science Education
1990	543	260
1991	595	255
1992	621	224
1993	504	192
1994	480	223
1995	410	215
1996	385	201
1997	372	185

BOR data show that the number of bachelor's degrees granted in science education and math education has remained fairly constant. See Table 2.

TABLE 2

DEGREES GRANTED - UNDERGRADUATE DEGREE PROGRAMS
STATE UNIVERSITY SYSTEM

Year	Mathematics Education	Science Education
1990	120	54
1991	144	61
1992	135	59
1993	189	74
1994	196	54
1995	167	57
1996	131	61
1997	105	59
1998	124	60

The University of Central Florida offered science education at its Brevard Campus approximately ten years ago. The program was terminated in 1992 due to low program enrollment and administrative changes. It has been reported that UCF is currently conducting a needs assessment in the region and is considering the delivery of science education at its branch campus.

Florida Tech's Science Education & Math Education Programs

Eight Florida Tech undergraduate degree programs in Science Education and Mathematics Education are supported by the state academic contract, including: biology (grades 6-12), chemistry (6-12), earth/space science (6-12), physics (6-12), mathematics (6-12), computer science (K-12), middle grades mathematics (5-9), and middle grades science (5-9). At Florida Tech, the only education majors are in secondary science and math and class sizes for education majors are small and focused. University administrators report that, often times, students enroll at Florida Tech as engineering or science majors but transfer to the education department to gain a teaching credential.

The science and math education programs are integrated across the University and both involve extensive coursework in the discipline area. Nearly 75 percent of the courses taken by science and math education majors are outside of the Science and Mathematics Department. Being housed in the College of Science and Liberal Arts results in a close association and coordination between the education students and faculty and the science/math faculty. Other departments in the College include biology, chemistry, physics and space science and mathematics

Programs in mathematics are based on the national Council of Teachers of Mathematics (NCTM) standards. Since the last five-year review, Dr. Kahle supportively reports that the programs have been revised to include an expanded measurement/evaluation/assessment two-course sequence, which helps to bring the programs in to alignment with national programs and state and national standards in both areas.

The science and math education programs are restricted to secondary certification (grades 5 through 12) and are closely related to school and district programs in the region. Science & math education students declare their major field and enter the degree program as freshmen (as opposed to juniors) which allows students to have 810 hours of clinical field experience spread throughout the four years of study. The program includes a two-semester internship in which the teacher candidate serves as a student teacher during the first semester and as a full-time teacher the second semester.

Facilities

The Science Education and Math Education Departments are housed in the University's Shephard Building. The building also houses the Space Coast Area Center for Educational Enhancement, a regional center for excellence in Mathematics, Science, Computers and Technology in Florida. The Center provides regional support for the improvement of teacher education by coordinating teacher enhancement activities, acting as a clearinghouse for educational resources and serving as a link between school districts, colleges and universities and business and industry.

A technology lab is available to all contract students, although all education methods' courses are now taught out in the local junior and senior high schools. Dr. Kahle stated that the department's

teaching laboratory now needs to be upgraded with additional hardware and software. Students and faculty have direct Internet access through the university's computer network.

Students

Data reported by the Department confirm that student demand for the science education and math education programs has remained fairly constant during the review period. See Table 3.

TABLE 3

ADMISSIONS DATA
FLORIDA TECH DEPARTMENT OF SCIENCE EDUCATION & MATH EDUCATION

	1994	1995	1996	1997	1998
Number of Program Applicants:	20	19	18	21	22
Number of Applicants Admitted:	9	8	10	12	14
Number Admitted and Enrolled:	4	2	3	6	8

In Table 4 and 5 below, the Department reports the following ethnicity for its science and math education students and for its contract-supported students during the review period.

TABLE 4

SCIENCE & MATH EDUCATION ENROLLMENT
BY GENDER AND ETHNICITY

Year	Female	Male	Am.Ind.	Asian	Black	Hisp.	White	Other
1994	16	14	0	1	2	0	26	1
1995	17	13	0	1	1	0	28	0
1996	21	13	0	2	1	0	31	0
1997	26	14	0	1	1	0	38	0
1998	29	11	0	1	1	0	38	0

TABLE 5

SCIENCE & MATH EDUCATION CONTRACT-SUPPORTED ENROLLMENT BY GENDER AND ETHNICITY

Year	Female	Male	Am.Ind.	Asian	Black	Hisp.	White	Other
1994	5	1	0	0	0	0	6	0
1995	3	2	0	0	0	0	5	0
1996	5	2	0	0	0	0	7	0
1997	4	3	0	0	0	0	7	0
1998	6	1	0	0	1	0	6	0

The consultant team interviewed five contract-supported students who endorsed their academic preparation and the value of the contract program as a key determinant in their university, degree program and professional decisions. A number of these talented students confirmed that they had opportunities to attend out-of-state universities and colleges, but utilized the state contract program to remain in Florida and attend Florida Tech. A number of public school personnel interviewed by the consultant team confirmed the strong preparedness of Florida Tech graduates.

The students emphasized the orientation of the program toward academic disciplines and confirmed that they took more content courses than their peers did in science education programs at other Florida institutions. The students also elaborated on the difficulty of taking math courses with mathematicians instead of education majors and taking science courses with scientists instead of education majors. Other program strengths identified by the students include the following: (1) a small department with direct student/faculty interaction; (2) a high amount of clinical field experiences throughout the program; (3) a strong technology component that results in graduates being far ahead of experienced teachers in schools; and (4) methods courses that are taught in the local junior and high schools.

The students confirmed that the Director of Teacher Education maintains direct and close contact with surrounding public schools which facilitates all types of placement and internship opportunities. They believe that they are prepared to teach diverse school populations and are encouraged to volunteer in area community centers, tutor in area schools and intern in a wide variety of educational settings. The students are highly motivated and many expressed an intention to obtain a graduate degree. They identified an unexpected benefit of the contract support in that it encourages maximum enrollments, which provides opportunities to graduate with certification in more than one science content area or with a combination of science and math certification. One student summarized the tuition differential program by stating: "The quality of Florida Tech programs attracts students to the university and the state contract support keeps them here."

The department data in Table 6 show the science and math education degrees granted by Florida Tech during the review period.

TABLE 6

FLORIDA TECH SCIENCE & MATH EDUCATION DEPARTMENT
DEGREES GRANTED

	1994	1995	1996	1997	1998
Contract-supported Graduates:	3	4	1	1	4
Total Program Graduates:	8	9	6	8	10

Demand for Graduates

National Perspective

Critical shortages exist in many states in secondary education programs in mathematics and science, and new teachers who are fully trained and qualified in their discipline area are especially needed in the southern and western states. In **Preparing Quality Teachers: Issues and Trends in the States**, a 1998 report issued by the State Higher Education Executive Officers, it is noted that many teachers who are hired to fill mathematics and science vacancies may not be academically qualified for the job. Based on the results of the national *Schools and Staffing Survey*, 1990-91, about 75 percent of secondary mathematics teachers majored or minored in mathematics, and only 62 percent of science teachers majored or minored in a science-based discipline. The National Science Foundation currently is emphasizing the improvement of science and mathematics education as a part of its policy agenda for the coming year. Additionally, an organization known as **Project Kaleidoscope** shares similar goals and vision statements on the national level and is working to increase the pool of qualified science and mathematics teachers.

Florida Perspective

The Florida Department of Education conducts a yearly survey of school districts to report on district hiring needs for the school year. The 1999 survey indicates that science and math teachers are the most highly requested certification areas by the various districts. Of forty-one respondents, 30 districts indicated the need for mathematics teachers and 20 districts specified middle grades mathematics. Further, 23 districts identified the need for chemistry teachers and 19 districts identified the need for both biology and physics teachers. With regard to middle grades, mathematics and science teachers were the most frequently needed certification areas by the responding districts.

Interviews with science education faculty confirmed the shortage of academically qualified science and math teachers in the public schools. Dr. Nancy Davis, a professor of science education at Florida State University, indicated that the numbers of teacher education graduates in these disciplines are down both on a state and national level, and that Florida is not meeting the

demand for graduates in science education. Similarly, Dr. Penny Gilmer, a professor of biological chemistry and Assistant Director of the **Florida Collaborative for Excellence in Teacher Preparation** indicated that the number of graduates in these fields must increase both in quantity and quality in Florida. The **Florida Collaborative,** a National Science Foundation project that includes public and private postsecondary institutions, was established to "bring together a diverse group of science/mathematics and education discipline faculty who are committed to improving the preparation of K-12 science and mathematics teachers and influencing the quality of education at the middle and high school levels.

The Department data in Table 7 show the number of Florida Tech graduates who were supported by the state contract who were employed within one year of graduation.

TABLE 7

PLACEMENT OF CONTRACT-SUPPORTED GRADUATES

Year	Contract Students Graduated	Employed in Florida	Employed Outside Florida	Further Education	Unknown
1993-94	3	1	1	0	1
1994-95	4	2	0	2	0
1995-96	1	1	0	0	0
1996-97	1	1	0	0	0
1997-98	4	3	0	0	1

SPECIFIC PLACEMENT INFORMATION

Position	Employer	Location
Science Teacher	St. Joseph Catholic School	Palm Bay, FL
Computer Teacher	Brevard Community College	Melbourne, FL
Science Instructor	Brevard Museum of Art and Science	Melbourne, FL
Science Teacher	Brevard County School System	Melbourne, FL
Science Teacher	Brevard County School System	Melbourne, FL

Critical Teacher Shortage Areas

Section 231,62, Florida Statutes, requires that the State Board of Education annually identify areas of critical teacher shortage for use in implementing teacher scholarship and loan programs. The shortage areas are determined following a review of teacher vacancies in comparison to new teacher hires, the percentage of out-of-field teachers newly hired and the supply of graduates of teacher education programs by discipline. For the 1999-2000 year, the State Board of Education has identified ***middle and high school level mathematics*** and ***middle and high school level science*** as critical teacher shortage areas.

The disparity between teacher graduates and teachers needed in science and math continues to be a concern in Florida, as out-of-field teachers increasingly are filling science and math vacancies. The Department of Education reports that vacancies over the next seven years in math and science are expected to be higher than in the past as enrollments in middle and high schools continue to increase. Fall 1997 found school districts scrambling to fill positions that represented 11 percent of their teacher workforce in both fields. As a result, 12 percent of the vacancies in math and 16 percent in science were filled out of field. There is a particular shortage of teachers in the physical science as 14 percent of teachers teaching earth science and seven percent of those teaching physics are teaching out of field.

The number of math and science teacher education graduates has been decreasing during the same years that enrollments in middle and high school have been increasing. The DOE reports that the numbers of 1997 graduates in these two subject areas were lower than in previous years. An additional problem exists, as strong, experienced science and math teachers continue to leave the classroom in favor of higher-paying positions in private industry.

Contract for State Support: Issues and Recommendations

Program Quality and Need - Florida Tech's Science Education and Mathematics Education programs attract high quality students, provide rigorous science and math coursework, combine pedagogy with science throughout the curriculum, promote an identity with the professional education community in East Central Florida and produce graduates who become Florida teachers. Dr. Kahle confirmed that these programs have a solid and strong academic discipline emphasis. Most courses are ones that science and mathematics majors must take; that is, they are not special courses for education majors only. Dr. Kahle stated that a key strength of the programs is the number of hours of clinical field experience that is required of science and mathematics education majors.

In her review, Dr. Kahle recognized the need for greater collaboration among faculty in the Department of Science and Math Education and the discipline departments and recommended joint appointments for the departments. She also recommended that the department's adjunct faculty who teach methods courses in the surrounding schools and supervise field experiences be more directly and actively integrated into the campus department.

While the consultant team learned that graduates of the past few years have chosen to work in community colleges, private schools and informal educational settings, it concluded that the Florida Tech programs continue to contribute to the available talent pool of academically-qualified science and math teachers in Florida. The shortage of qualified science and mathematics teachers in the public schools was verified by the State Board of Education's identification of ***middle and high school level mathematics*** and ***middle and high school level science*** as critical teacher shortage areas in Florida for 1999-2000.

Dr. Kahle concluded that the academic contract for Florida Tech's Science & Math Education program "helps to provide Florida with a cadre of teachers who have outstanding content

backgrounds and extensive experiences in schools." She reported on national research that found that teachers with this type of preparation are more effective in classrooms and that their teaching enhances the learning of students.

Program Diversity - The Department of Science & Math Education reports that it makes a concerted effort to encourage minority students to apply for admission and coordinates a separate scholarship for minority students who may have substantial financial need. However, the Department has largely been unsuccessful in the recruitment, retention and graduation of minority students. Data in Tables 4 and 5 show that the Department's annual enrollment included a maximum of three minority students during the review period and that one minority student was supported by the state contract. Dr. Kahle recommended that minority student recruitment should be more extensive and that student teaching placements should reach to diverse geographical regions in Florida.

State Funding - The state academic contract for Florida Tech's Bachelor of Science program in Science and Math Education was established in 1983 and was initially funded at $35,508. State support for the contract peaked in 1988 when $115,354 was appropriated. Since that year, additional state budget reductions further reduced the level of funding for the contract. State support has steadily declined as the Legislature has held the state appropriation for each contract relatively constant, in effect, "rolling over" the previous year's dollar amount each year. See Table 8. This action has resulted in a gradual erosion of the funding level, as increased tuition and program costs each year have steadily reduced the number of students supported. Data in Table 1 on Page 3 confirm the decline in the number of students served by the contract. Since 1994, the annual legislative appropriation has held constant.

TABLE 8

FUNDING HISTORY (1994-1999)

Year	PEPC Funding Recommendation	Legislative Appropriation
1994	$303,504	$86,787
1995	$227,463	$86,787
1996	$234,949	$86,787
1997	$241,505	$86,787
1998	$247,786	$86,787
1999	$251,652	$86,787

As shown in Table 7, the 1998 Commission recommended state support for 550 student credit hours for the 1999-2000 academic year at a projected cost of $251,652. The 1999 Legislature, however, appropriated the same dollar amount as in previous years: $86,787.

2000-2001 Contract Funding Recommendation

Florida Institute of Technology reports that it has moved from a cost per credit hour tuition basis to a flat rate tuition. For the 2000-2001 academic year, the University recommends state support for 18 students in its BS in Science and Math Education programs.

The Commission recommends that the state academic contract for the Florida Institute of Technology's BS in Science Education and Math Education be funded for the 2000-2001 academic year to support 384 semester credit hours at an estimated cost of $ 169,555.

B. UNIVERSITY OF MIAMI - BS in Industrial Engineering

The state academic contract for the University of Miami's Bachelor of Science degree in Industrial (manufacturing) Engineering was established in 1983. No other private or public Florida college or university offers a degree program in industrial engineering with an accredited program in manufacturing engineering. The undergraduate program is one of only seventeen manufacturing programs nationwide accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET). A wide range of manufacturing companies in South Florida, particularly in the medical device field, employ graduates of the manufacturing program who receive specialized training in areas such as computer numerical control (CNC) and tool design.

To assist in the five-year review of this academic contract, the Department of Education's Office of Postsecondary Education Coordination (OPEC) contracted with Dr. J.T. Black, Professor Emeritus of Industrial Systems Engineering, Auburn University. Dr. Black's review appears in Appendix C. Other members of the March 25, 1999 site visit review team were Taylor Cullar and Nate Johnson from the OPEC. This is the Commission's third five-year review of this contract program.

Industrial/Manufacturing Engineering in Florida

Four State University System institutions, Florida State University, Florida Agricultural and Mechanical University, University of Central Florida and the University of South Florida, offer undergraduate engineering degrees in industrial engineering. Florida International University offers an undergraduate degree in industrial/systems engineering. None of these institutions has an ABET accredited industrial/manufacturing degree program. Within these industrial engineering programs, courses, usually electives, are offered in manufacturing or systems processes. In South Florida, FAU offers a degree in mechanical engineering that includes two elective courses in manufacturing processes. The institution does not offer a B.S. degree in industrial or manufacturing engineering. FIU does offer a master's degree in manufacturing engineering that includes courses in product design for manufacturing. According to the consultant, neither FIU nor FAU have undergraduate industrial engineering programs that are "remotely" comparable to the one at UM. It is the combination of both the industrial and manufacturing engineering programs that make this particular undergraduate engineering degree so unique in Florida. There are no comparable programs in either Georgia or Alabama.

University of Miami's Industrial/Manufacturing Engineering Program

The University of Miami's (UM) Department of Industrial Engineering is one of five departments in the College of Engineering. The other departments are Biomedical Engineering, Civil and Architectural Engineering, Electrical and Computer Engineering, and Mechanical Engineering. Students may seek a degree in industrial engineering without the manufacturing component. The state subsidy is only for those upper-level students who are enrolled in the industrial/manufacturing engineering program. The program is relatively small, 35 majors were

enrolled in fall 1998, 19 of whom received the state subsidy. The objective of the program is to provide each student with the type of broad training in engineering fundamentals needed to analyze and to solve complex problems involving integrated systems of people, materials, equipment, information, and facilities. Students are made aware of the issues of global competitiveness, including the impact that design, quality, and productivity have in controlling economic factors and conserving limited resources.

According to the consultant, the quality of the manufacturing engineering curriculum is excellent. The quality of the program is recognized both nationally and internationally. Since the last five-year review in 1993, the manufacturing curriculum has been revised to expose students to engineering concepts from the first semester. The program curriculum relies heavily on the use of various educational manufacturing technologies. Several manufacturing engineering classes require the use of special software packages while many courses utilize laboratory experience as an integral part of the course requirements. To gain engineering design experience, the department introduces students to supervised "hands on" product design in manufacturing and in modern concepts of automation. Manufacturing students work on several design projects that involve end effector (hand or arm) design for robots, design of feeding systems, and implementation of sensor technology in process design. In addition, students write programs for the implementation of various robotic/assembly applications using several robot systems. Many upper-division students have internships with major firms in South Florida that add to their experience and marketability.

According to Dr. Black, the seven person, full-time, research-oriented faculty are well qualified and maintain a close working relationship with local and state industry and national engineering societies to ensure that the manufacturing curriculum remains relevant and up-to-date. The consultant did recommend, however, that the university hire an additional faculty member with manufacturing systems expertise. In June 1999, the industrial/manufacturing department hired a professor whose expertise is in the area of manufacturing automation and control.

Facilities

The Department of Industrial Engineering has a specialty focus on manufacturing technology and global competitiveness. The research-oriented faculty and administration have been able to develop high quality laboratories largely through external grants and equipment awards. Industrial engineering students have access to the college of engineering computer laboratory, the ergonomics, biomechanics, and industrial hygiene laboratories, the work design laboratory, and the computer integrated manufacturing laboratory, and the engineering laboratory (machine shop). To improve the shop support for faculty and students, the engineering laboratory has upgraded its equipment by purchasing several new items. Physical reorganization of the laboratory has improved the utilization of available space. The consultant found that all of the facilities for the industrial/manufacturing programs were acceptable, but because of the growth in the medical devises industry in South Florida, he recommended that the department expand the manufacturing processes in the forming area where students are exposed to the "hands on" machinery used in making medical devices.

Students

While the number of students receiving graduate level degrees in engineering decreased nationwide (including in Florida's public and private universities) in recent years, the number of undergraduates majoring in engineering in both sectors has begun to rise. National trends point to a "hot" job market for undergraduates, particularly in the engineering and science fields. Recent studies reveal that undergraduates, in particular, tend to remain and work in the state where they received their degree. Graduate recipients, especially Ph.D. holders, are much more likely to seek high-wage job opportunities in other states or nations. Florida's expanding high technology economy is increasingly dependent on a skilled workforce. Furthermore, the state's ability to attract additional high-wage industry and outside investment is linked in part to the availability of highly trained workers to meet employment demands.

The number of students enrolling in Miami's industrial/manufacturing B.S. program has slightly increased over a five-year period. There are currently 35 students enrolled in the program, 19 of whom are supported by the state subsidy. The number of minority students enrolled in the program remains among the highest of all the state contract programs.

TABLE 1

INDUSTRIAL/MANUFACTURING ENROLLMENT BY GENDER AND ETHNICITY

Year	Female	Male	Asian	Black	Hispanic	White
1994	8	22	0	2	22	6
1995	9	22	1	3	21	6
1996	5	28	1	2	16	12
1997	5	26	1	7	16	7
1998	10	25	1	4	21	9

TABLE 2

INDUSTRIAL/MANUFACTURING (CONTRACT STUDENTS) ENROLLMENT BY GENDER AND ETHNICITY

Year	Female	Male	Asian	Black	Hispanic	White
1994	4	11	1	1	11	2
1995	5	11	1	2	11	2
1996	3	13	0	1	12	3
1997	3	14	0	4	12	1
1998	7	12	0	2	15	2

Students who have declared their major as industrial engineering/manufacturing generally become eligible for the tuition differential in their junior year, although some students become eligible in their sophomore year for certain 300 level classes. Students must have a cumulative GPA of 2.50 or above. The College of Engineering works closely with local high school and community colleges to recruit students into the program. UM has an articulated program with Miami-Dade Community College in which students complete the first two years at MDCC and the last two years at the university. In fall 1998, 24 percent of the enrolled students in the state subsidy program were transfer students. The average number of credit hours taken by contract students to complete the degree program is 159 semester hours. The highest number is 175.

During the site visit, members of the consultant team interviewed 35 current students. All but 13 of the students were receiving the state subsidy. As a group, they expressed their satisfaction with the program and testified to the high quality of their educational experience which indulged the hands-on aspects of the technical courses, the personal relationship with the faculty, and most significantly the small classes at the University of Miami. Students receiving the tuition differential said the financial assistance was critical to their decision to enroll at the University of Miami instead of attending an out-of-state institution. Site team members interviewed six recent graduates of the program. These alumni all received the state subsidy and currently work for companies in South Florida as industrial engineers. The former students agreed that they were able to obtain their jobs because of the prestige of the UM engineering degree, and because they had the manufacturing expertise required for employment.

Students in the program maintain a close working relationship with faculty through personalized attention in advising sessions and joint research efforts. Students are encouraged to interact with industry, government, and service organizations in the area by attending professional seminars and workshops in specific subjects of manufacturing engineering. The department maintains strong interaction with local manufacturing and service industries in order to make students aware of opportunities in these industries for projects, internships, and co-op programs. All seniors create a design project that is judged by industry judges. Graduates must demonstrate specific abilities before leaving the program. Graduates receive an exit interview to help measure the effectiveness and quality of the program.

Thirty-one contract students graduated from the program between 1994-1998. Of that number, thirty are working in Florida, and one is in graduate school. Thus, one of the key outcomes of any contract program, providing highly skilled educated graduates to fill the unmet needs of employers in Florida, is being met by the University of Miami's industrial/manufacturing engineering B.S. program. Most of the graduates of the program are employed as industrial engineers, a few in other engineering positions.

Department data in Table 3 show the number of manufacturing engineering graduates who were supported by the state contract who were employed within one year of graduation.

TABLE 3

PLACEMENT OF CONTRACT-SUPPORTED GRADUATES

Year	Contract Students Graduated	Employed in Florida	Employed Outside Florida	Further Education	Unknown
1993-94	8	8	0	0	0
1994-95	7	7	0	0	0
1995-96	7	7	0	0	0
1996-97	5	5	0	0	0
1997-98	4	3	0	1	0

SPECIFIC PLACEMENT INFORMATION

Position	Employer	Location
Industrial Engineer Specialist	UPS	Florida
Methods Analysis	American Bankers Insurance Group	Florida
Industrial Engineer	American Express	Florida
Sale Engineer	Goulds Pumps Inc.	Florida
Production Manager	Taco Metals Inc.	Florida
Manager Trainee	Rinker Material Corporation	Florida
Maintenance Process Industrial Engineer	Ryder Transportation Service	Florida
Industrial Engineer	Cordis Johnson and Johnson Corporation	Florida
Industrial Engineer	Anderson Consulting	Florida

Demand for Graduates

Future employment opportunities for manufacturing engineering graduates are excellent as depicted by the positive employment trends both at the state and national levels. According to the United State Department of Commerce, Bureau of Economic Analysis, over 525,000 jobs in the manufacturing sector will be generated in Florida in the year 2000. The Florida Department of Labor projects that the need for industrial engineers statewide will increase by nine percent by 2006. According to the University of Miami, the demand for manufacturing engineers in design manufacturing and research and development in Florida is increasing with a concomitant capital investment in manufacturing and manufacturing support services. At the same time, ongoing technological changes in industry are increasing the demand for better trained manufacturing engineers. According to the consultant, there "has always been and will continue to be demand for engineers who know how things are made-aka manufacturing engineers." Dr. Black noted that the creation of wealth, the very heart of the standard of living, is based on agriculture, mining, or

manufacturing. Thus, manufacturing engineers are crucial to a state's economy and "they can always get a job because companies who make things always need this kind of engineer." The baccalaureate level manufacturing engineer is "ready for work" at that degree level.

Contract for State Support: Issues and Recommendations

Program Quality and Need - The University of Miami's industrial/manufacturing engineering degree program attracts a diverse, talented group of upper-division students who, upon graduation, are employed by local and state manufacturing companies. Of the thirty-one students who have graduated since 1993, all but one are working for Florida manufacturing companies, which include Motorola, Cordis, Johnson and Johnson, and the Ryder Corporation. The majority of the contract-supported students are minorities who would not have been able to attend the university without the state subsidy.

Just as the manufacturing department produces graduates who fill high-technology employment needs in Florida, the quality of the program's graduates has generated interest on the part of companies, as well as national organizations, in assisting in the further development of the program. Since 1993, the College of Engineering has invested more than $580,000 in institutional and private funds building the manufacturing program and its associated laboratories. According to Dr. Black, the growth of the medical devices industry in South Florida has occurred, in part, because of the availability of UM's manufacturing engineers. In addition, there is an increasing emphasis in Southeast Florida on commercial manufacturing. In recent years the region has become more of a distribution center with increasing numbers of assembly and light "clean" manufacturing plants and ancillary industries to supply components and parts. The Greater Miami Chamber of Commerce projects that international economic activity in Miami-Dade County will grow to over $70 billion by 2000.

The industrial/manufacturing program is well recognized nationally and internationally. According to the consultant, the program has a "unique character and outstanding faculty" making it one of only 17 ABET accredited manufacturing programs nationwide. Its graduates are making a positive impact on Florida's economy and are filling a need for employees with specialized training in manufacturing engineering.

State Funding – The state academic contract for the University of Miami's B.S. in industrial/manufacturing engineering was initially funded by the 1983 Legislature at $97,000. From 1994-1998, legislative appropriations were as follows:

Table 4

ANNUAL STATE FUNDING
RECOMMENDATIONS AND APPROPRIATIONS

YEAR	PEPC/DOE FUNDING RECOMMENDATIONS (FTE/SCH)	LEGISLATIVE APPROPRIATION
1994	$418,428 (30/887)	$182,082
1995	$318,536 (520 SCH)	$182,082
1996	$239,087 (370 SCH)	$182,082
1997	$251,267 (370 SCH)	$182,082
1998	$235,844 (311 SCH)	$182,082
1999	$246,446 (331 SCH)	$246,446 (331 SCH)

2000-2001 Contract Funding Recommendation

The Commission recommends that the state contract for the University of Miami's Bachelor of Science degree in Industrial/Manufacturing Engineering be funded for the 2000-2001 academic year at to $257,369 support 331 SCH.

III. ANNUAL CONTRACT REVIEWS

Each year, the Commission conducts contract reviews to support its recommendations to the State Board of Education on the renewal of each contract and to formulate a budget recommendation. Annual contract reviews are conducted following the submission of an annual report form by the institution's contract administrator. Statistical data on contract program enrollments and graduates is collected and compiled by the Department of Education Office of Postsecondary Education Coordination. The annual review of each contract program, including student/faculty ratio, admission practices, minority participation rate and student demand, may serve to identify a deterioration in quality of a contract which would warrant additional scrutiny. A copy of the annual contract report form appears in Appendix B.

During the annual review process, each program is analyzed for continued compliance with the provisions of State Board of Education Rule 6A-10.032, FAC. Specific review criteria include:

- Unmet needs (student demand)
- Adequacy of resources
- Employer demand
- Specialized accreditation
- State subsidy (cost)
- Existing programs at other institutions in the region
- Consistency with the State Master Plan
- Minority participation
- Ratio of students enrolled under the contract to the number of graduates produced.

Following each review, a funding level for state support for the contract for the 2000-2001 year is recommended. Upon approval by the Commission, funding recommendations for the contracts are forwarded to the Department of Education for submission to the State Board of Education and the Legislature.

A. 1. FLORIDA INSTITUTE OF TECHNOLOGY - BS in Engineering

Contract Summary

- The contract was initially funded by the 1981 Legislature at $124,000.
- The program is the only university located in East Central Florida with ABET-accredited degree programs in Engineering.
- This region is now a center of high technology, particularly in the areas of aerospace, electronics, and computers, with steady growth in start-up industries, joint business ventures and research programs.
- The 1998 Five-year review found that the engineering programs are exemplary and are providing a valuable service to Florida residents and to engineering employers in Florida. Employers in the East Central Florida region confirmed that demand for technically trained engineers in industry will continue to outstrip supply. Review consultant recommended that "the level of funding be increased in accordance with the original program plans."

1998-99 Student Demand

Program Applicants	917
Applicants Admitted	772
Total Applicants Denied	107
Qualified Applicants Denied	0
Applicants Enrolled	244

- Students in Program who: Applied for state contract funds: 240
  Received state contract funds: 35

1998-99 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	1	0	0	6	0	7	6	1
MALE	0	2	2	24	0	28	25	3
ALL	1	2	2	30	0	35	31	4

1998-99 Student Credit Hours

Total Student Credit Hours (SCH) - 133

1998-99 Placement of Graduates

[unavailable]

FLORIDA INSTITUTE OF TECHNOLOGY - BS in Engineering

State Funding

The 1998 Commission recommended $921,600 to support 2,000 student credit hours for the 1999-2000 academic year. The 1999 Legislature, however, appropriated $401,346 for the contract program, the same amount as in the previous seven years.

2000-2001 Contract Funding Recommendation

University Request: State support for 2,000 student credit hours (SCH)

Commission Recommendation: ***$883,100 for 2,000 SCH***

B. 1. UNIVERSITY OF MIAMI - BS in Architectural Engineering

Contract Summary

- The contract was initially funded by the 1989 Legislature at $93,720 to support ten FTE as a first-year, phase-in. Since the initial state appropriation in 1989, second year, phase-in funding has not been appropriated by the Legislature.

- The university offers the only BS program in architectural engineering in Florida. The program is one of 13 U.S. programs accredited by the Accreditation Board of Engineering and Technology (ABET).

- Program graduates continue to be in demand due to the steady growth of the building and construction industries in South Florida, and due to the increasing complexity of building systems. The department reports that, responding to student demand, a number of universities nationally are contemplating architectural engineering programs.

- The majority of Florida residents in the program are recruited as a result of the program's 2+2 articulation agreement with the pre-engineering programs at community colleges in Dade and Broward counties.

1998-99 Student Demand

Program Applicants	109
Applicants Admitted	88
Total Applicants Denied	10
Qualified Applicants Denied	0
Applicants Enrolled	21

- Students in Program who: Applied for state contract funds: 14
  Received state contract funds: 14

1998-99 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	0	0	6	0	0	6	6	0
MALE	0	3	3	2	0	8	8	0
ALL	0	3	9	2	0	14	14	0

1998-99 Student Credit Hours

Total Student Credit Hours (SCH) – 400

1998-99 Placement of Graduates

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	2	0	0	0	2
FLORIDA	2	0	0	0	2
OUT-OF-STATE	1	0	1	0	2
TOTAL	5	0	1	0	6

Positions: Engineer (4)
Graduate Student
Seeking employment (1)

UNIVERSITY OF MIAMI - BS in Architectural Engineering

State Funding

The 1998 Commission recommended $223,365 to support 300 student credit hours for the 1999-2000 academic year. The 1999 Legislature appropriated the recommended amount of $223,365 for the contract program.

2000-2001 Contract Funding Recommendation

University Request: State support for 400 student credit hours (SCH)

Commission Recommendation: ***$ 233,265 for 300 SCH***

2. UNIVERSITY OF MIAMI – MS in Biomedical Engineering

Contract Summary

- The contract was initially funded by the 1984 Legislature at $40,680. Contract funding for the program peaked in 1988 at $113,478 for 12 FTE students. Since that time, contract dollars have gradually declined which has resulted in a drop in FTE student support.

- The University of Miami provides the only programs in Florida that offer the MS and Ph.D. degrees in biomedical engineering. The Board of Regents has recently approved the implementation of graduate degree programs at Florida International University and at the FAMU/FSU College of Engineering.

- Following a five-year review of the contract in 1995, it was recommended that the contract be expanded to support both graduate and undergraduate students. This expansion, however, was not funded by the Legislature.

- The biomedical device industry in Florida remains healthy and expanding and demand for technical employment in these companies continues to rise. Several biomedical device firms in South Florida have been acquired by large corporations who are expanding their operations. These expansions are likely to translate into higher employment demand for graduates.

1998-99 Student Demand

Program Applicants	207
Applicants Admitted	184
Total Applicants Denied	23
Qualified Applicants Denied	0
Applicants Enrolled	18

- Students in Program who: Applied for state contract funds: 23
  Received state contract funds: 18

1998-99 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	Not Reported	ALL	FULL	PART
FEMALE	0	1	2	1	0	4	3	1
MALE	2	0	4	6	2	14	6	8
ALL	2	1	6	7	2	18	9	9

1998-99 Student Credit Hours

Total Student Credit Hours (SCH) - 142

1998-99 Placement of Graduates

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	5	1	1	0	7
FLORIDA	0	0	0	0	0
OUT-OF-STATE	0	0	1	0	1
TOTAL	5	1	2	0	8

Specific Placement/Location

Consultant-Miami
Engineer-Miami
Assistant Professor-University of Miami
R&D Engineer-Miami
Partner/Technician-Z Tech (Miami)
Furthering education-2

UNIVERSITY OF MIAMI - MS in Biomedical Engineering

State Funding

The 1998 Commission recommended $168,735 to support 250 student credit hours for the 1999-2000 year. The 1999 Legislature appropriated funds at the recommended amount of $168,735 for the contract program.

2000-2001 Contract Funding Recommendation

University Request: State support for 607 student credit hours (SCH) at $426,196

Commission Recommendation: ***$ 176,112 for 250 SCH***

3. UNIVERSITY OF MIAMI - BS in Nursing

Contract Summary

- The University of Miami RN-BSN contract was initially funded by the 1979 Legislature at $200,000. The funding level was gradually increased and was funded in 1988-89 at $460,673.

- The contract program meets a unique need in South Florida for training in transcultural nursing. The BSN program is innovative, flexible, and maintains a direct link to the South Florida communities.

- The 1998 Five-year review found substantial changes in the health care delivery system that has created new employment opportunities for nurses in primary care settings and as members of interdisciplinary health care teams. Nurse executives confirmed that there is an acute shortage in South Florida and expressed a need for baccalaureate-trained nurses.

- The contract program has an exemplary record and success in the production of baccalaureate-trained minority nurses.

1998-99 Student Demand

Program Applicants	49
Applicants Admitted	23
Total Applicants Denied	1
Qualified Applicants Denied	0
Applicants Enrolled	23

- Students in Program who: Applied for state contract funds: 52
  Received state contract funds: 52

1998-999 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	2	7	7	29	0	45	33	12
MALE	0	0	3	4	0	7	5	2
ALL	2	7	10	33	0	52	38	14

1998-99 Student Credit Hours

Total Student Hours (SCH) - 1040 = credit hours supported by contract

1998-99 Placement of Graduates

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	23	0	0	0	23
FLORIDA	0	0	0	0	0
OUT-OF-STATE	0	0	0	0	0
TOTAL	23	0	0	0	23

Specific Placement Information (Partial List)

Position	Location
Staff Nurse	Jackson Memorial
Staff Nurse	Monroe County Prison
Staff Nurse	Baptist Hospital
Nurse Manager	Deering Hospital
Assistant Director	Home Health Care
Head Nurse, Recovery	Kendall Regional Medical Center
Staff Nurse, GI Department	Columbia Cedars Hospital
Staff Nurse, Neurosurgical ICU	Jackson Memorial
Assistant Director, ER	Pan American Hospital
Staff Nurse	Mercy Hospital

[Several others are interviewing for similar positions]

UNIVERSITY OF MIAMI – BS in Nursing

State Funding

The 1998 Commission recommended $595,640 to support 800 student credit hours for the 1999-2000 academic year. The 1999 Legislature appropriated the recommended amount of $595,640 for the contract program.

2000-2001 Contract Funding Recommendation

University Request: State support for 800 student credit hours (SCH)

Commission Recommendation: ***$ 622,040 for 800 SCH***

4. UNIVERSITY OF MIAMI – MS in Nursing

Contract Summary

- The contract was initially funded by the 1985 Legislature at $350,400 to support 40.3 FTE students. Since that year, funding has remained constant, which has resulted in a gradual reduction in state support per student.

- The University of Miami MSN program is one of seven National League of Nursing accredited master's programs in Florida and one of three in South Florida. The MSN curriculum is directed toward strengthening the preparation of all advanced practice students to assume provider, coordination and/or management roles in acute and primary care settings.

- Nationally, the requirement for masters and doctoral-trained nurses is projected to increase due to the increasing complexity of the health care delivery system and the patient population it serves. Several recent federal policy initiatives have demonstrated increasing demand for the role of nurses in primary care as family nurse practitioners and nurses-midwives.

- The market in South Florida for advanced practice nurses continues to grow, as evidenced by increasing demand for graduates, growing acceptance by other disciplines, and changes in the regulatory and reimbursement climate for nurse practitioners. The National Council of State Boards of Nursing is promoting the requirement that all nurses practicing in "advanced" practice roles be prepared at least at the MSN level.

- In the past five years, the MSN contract program has graduated 35 nurse midwives, 59 nurse practitioners, and 76 clinical nurse specialists.

1998-99 Student Demand

Program Applicants	39
Applicants Admitted	35
Total Applicants Denied	4
Qualified Applicants Denied	0
Applicants Enrolled	35

- Students in Program who: Applied for state contract funds: 49
  Received state contract funds: 49

1998-999 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	1	9	4	33	0	47	8	39
MALE	0	0	1	1	0	2	0	2
ALL	1	9	5	34	0	49	8	41

1998-99 Student Credit Hours

Total Student Hours (SCH) - 553 = credit hours supported by contract

1998-99 Placement of Graduates

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	12	0	0	1	13
FLORIDA	0	0	1	0	1
OUT-OF-STATE	1	0	0	0	1
TOTAL	13	0	1	1	15

Specific Placement Information (Partial List)

Position	Location
Family Nurse Practitioner	VAMC (2)
Family Nurse Practitioner	Baptist Hospital
Family Nurse Practitioner	Cardiovascular Center
Family Nurse Practitioner	Family practice (3)
Nurse Midwife	Baptist Hospital
Nurse Midwife	Physician-based practice
Nurse Midwife	Broward General

[Several others are interviewing for similar positions]

UNIVERSITY OF MIAMI – MS in Nursing

State Funding

The 1998 Commission recommended $401,589 to support 595 student credit hours for the 1999-2000 academic year. The 1999 Legislature appropriated the recommended amount of $401,589 for the contract program.

2000-2001 Contract Funding Recommendation

University Request: State support for 660 student credit hours (SCH)

Commission Recommendation: ***$ 419,148 for 595 SCH***

5. UNIVERSITY OF MIAMI – Ph.D. in Marine and Atmospheric Sciences

Contract Summary

- The contract was initially funded by the 1985 Legislature at $150,000 and is based on the full cost of instruction and not a tuition differential.

- The program is at the Rosenstiel School of Marine and Atmospheric Sciences, one of the premier oceanographic institutes in the world. The Rosenstiel School is organized in the following divisions: Applied Marine Physics and Ocean Engineering with its Ocean Pollution Research Center, Marine and Atmospheric Chemistry, Marine Affairs, Marine Biology, Marine Geology and Geophysics, and Meteorology and Physical Oceanography.

- The school reports a severe shortage in the U.S. of trained marine scientists as demonstrated by strong demands for graduates in university research and academic faculty, government agencies, and private industry positions. There is a growing need for applied marine physicists and researchers and instructors in the field of oceanography, marine chemistry, and geology.

- The 1997 Five-year review recommended an increase in state funding for the program. The review consultant noted that the severe shortage of trained scientists in marine and atmospheric sciences more than justifies the continuation and strengthening of both the Rosenstiel program and public university programs.

1998-99 Student Demand

Program Applicants	18
Applicants Admitted	9
Total Applicants Denied	9
Qualified Applicants Denied	0
Applicants Enrolled	9

- Students in Program who: Applied for state contract funds: 9
  Received state contract funds: 9

1998-99 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	0	0	1	7	0	8	8	0
MALE	0	0	0	13	0	13	13	0
ALL	0	0	1	20	0	21	21	0

1998-99 Student Credit Hours

Total Student Hours (SCH) - 236

1998-99 Placement of Graduates

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	-	-	-	-	-
FLORIDA	-	-	-	-	-
OUT-OF-STATE	-	-	-	-	-
TOTAL	0	-	-	-	0

UNIVERSITY OF MIAMI - PH.D. in Marine and Atmospheric Sciences

State Funding

The 1998 Commission recommended $531,900 to support 15 student credit hours for the 1999-2000 academic year. The 1999 Legislature appropriated the recommended amount of $531,900 for the contract program.

2000-2001 Contract Funding Recommendation

University Request: State support for 200 student credit hours (SCH)

Commission Recommendation: ***$531,900 for 150 SCH [$3546 per SCH]***

6. UNIVERSITY OF MIAMI – Ph.D. in Biomedical Sciences

Contract Summary

- The state contract for the University of Miami's Ph.D. program in Biomedical Sciences was established by the 1985 Legislature at $100,000 and was fully funded in 1988 to support 16 FTE students at $457,596. The contract program is the only Ph.D. Program in this discipline in South Florida.

- Since its inception, the contract has been based on the full cost of instruction per student and not a tuition differential.

- The State contract funds Ph.D. students in a four-year program for training to be researchers and faculty members in the medical sciences, in the areas of protein chemistry, cell biology, immunology, gene cloning, nucleic acid technology and drug discovery.

- Through 1995, the national bio-tech industry created some 100,000 new jobs for Ph.D.-level individuals in biomedical sciences. Those highly trained individuals are the key skilled personnel in this latest area of US industrial strength.

- The 1996 Five-year review found that the program has rejuvenated the biotechnology and pharmaceutical industries in South Florida. The state contract ensures that qualified Florida residents will be included in an exemplary doctoral program that recruits among the brightest students throughout the world.

1998-99 Student Demand

Program Applicants	252
Applicants Admitted	56
Total Applicants Denied	196
Qualified Applicants Denied	93
Applicants Enrolled	31

- Students in Program who: Applied for state contract funds: n/a
  Received state contract funds: 16

1998-99 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	0	1	0	6	0	7	7	0
MALE	0	0	2	7	0	9	9	0
ALL	0	1	2	13	0	16	16	0

1998-99 Placement of Graduates

[partial list]

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	0	0	0	0	0
FLORIDA	0	0	0	0	0
OUT-OF-STATE	1	0	0	0	1
TOTAL	1	0	0	0	1

Placement Information

Scientist—San Francisco, CA

UNIVERSITY OF MIAMI--PH.D. in Biomedical Sciences

State Funding

The 1998 Commission recommended $576,000 to support 18 students for the 1999-2000 academic year. The 1999 Legislature appropriated the recommended amount of $576,000 for the contract program.

2000-2001 Contract Funding Recommendation

University Request: Support for 18 "Florida Scholars" - $576,000 for full cost of instruction

Commission Recommendation: ***$ 576,000 to support 18 students***

7. UNIVERSITY OF MIAMI – BS in Motion Pictures

Contract Summary

- The state contract for the University of Miami's BS in Motion Pictures proram was initially recommended by the 1989 Commission to support 15 FTE incoming junior students to be followed by a second class of juniors and seniors the following year. The 1995 Legislature appropriated $275,657 to establish the state contract.

- The 1989 contract proposal by the University of Miami was in response to the Commission's 1987 study of *Postsecondary Education Needs of the Film Industry in Florida,* which was conducted in cooperation with the Florida Motion Pictures, Television and Recording Industry Advisory Council. The study found that there was an unmet need in Florida's film industry for postsecondary film graduates.

- South Florida remains the center of film and television production in Florida and ranks third in the nation behind New York and Los Angeles among all metropolitan areas. There are more than 300 production and production-related companies based in South Florida with more than 8,000 employees.

- The UM program is ranked among the top five film programs in the U.S. and is the only baccalaureate film program in south Florida. The contract addresses an unmet need in Florida's film industry for postsecondary film graduates.

1998-99 Student Demand

Program Applicants	70
Applicants Admitted	54
Total Applicants Denied	16
Qualified Applicants Denied	7
Applicants Enrolled	9

- Students in Program who: Applied for state contract funds: 70
  Received state contract funds: 54

1998-99 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	0	6	6	13	0	25	24	1
MALE	0	7	13	7	2	29	29	0
ALL	0	13	19	20	2	54	53	1

1998-99 Student Credit Hours

Total Student Hours (SCH) - 429

1998-99 Placement of Graduates

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	1	0	0	2	3
FLORIDA	5	0	1	0	6
OUT-OF-STATE	3	0	0	0	3
TOTAL	9	0	1	2	12

UNIVERSITY OF MIAMI - BS in Motion Pictures

State Funding

The 1998 Commission recommended $335,047 to support 450 student credit hours for the 1999-2000 academic year. The 1999 Legislature, however, appropriated $763,400 for the contract program, including $428,353 for program enhancements.

2000-2001 Contract Funding Recommendation

University Request: State support for 54 students at $1,031,400.

Commission Recommendation: $349,897 For 450 SCH

8. UNIVERSITY OF MIAMI – BS in Music Engineering Technology

Contract Summary

- In 1996, the Commission recommended the establishment of a state academic contract for the University of Miami's Bachelor of Music degree in Music Engineering Technology. The 1998 Legislature appropriated $200,000 to establish the state contract.

- During its review, the Commission found that the University of Miami program is known internationally as a leader in the music/audio field. The contract program is an innovative, interdisciplinary baccalaureate program in the music/audio field that focuses on the needs of industry in computers, digital systems, and audio applications to video technologies.

- The Commission found that the need for audio engineers in Southeast Florida is increasing as recording studios, theaters, entertainment venues and related manufacturing and electronic companies continue to expand. There is an increasing demand in the radio/television and video industries, particularly in South Florida, for graduates who are skilled in software programming and the design of hardware circuitry.

1998-99 Student Demand

Program Applicants	49
Applicants Admitted	35
Total Applicants Denied	NA
Qualified Applicants Denied	NA
Applicants Enrolled	23

- Students in Program who: Applied for state contract funds: 12
  Received state contract funds: 11

1998-99 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	0	0	0	1	0	1	1	0
MALE	0	1	0	9	0	10	10	0
ALL	0	1	0	10	0	11	11	0

1998-99 Student Credit Hours

Total Student Hours (SCH) - 496

1998-99 Placement of Graduates

[first year of contract]

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	-	-	-	-	-
FLORIDA	-	-	-	-	-
OUT-OF-STATE	-	-	-	-	-
TOTAL	-	-	-	-	-

UNIVERSITY OF MIAMI – BS in Music Engineering Technology

State Funding

The 1998 Commission recommended $335,047 to support 450 student credit hours for the 1999-2000 academic year. The 1999 Legislature appropriated the recommended amount of $335,047 for the contract program.

2000-2001 Contract Funding Recommendation

University Request: 540 Student Credit Hours (SCH) at $419,375

Commission Recommendation: $ 349,897 for 450 student credit hours

C. 1. BARRY UNIVERSITY – BS in Nursing

Contract Summary

- The contract for Barry University's BS in Nursing program was initially funded by the 1989 Legislature at $242,330 to support 20 FTE. Since 1989, state funding has gradually been reduced to $189,989.

- The State contract supports the only baccalaureate, accelerated-option program in the State that is designed to prepare an individual possessing a bachelor's degree in any field with the necessary training to be employed as a registered nurse. The program is a 12 month curriculum.

- The program addresses the shortage of baccalaureate-trained nurses and the supply of registered nurses, particularly in Southeast Florida. The department also has reported that other nursing programs including state universities are limiting enrollment, so the number of new graduates is decreasing.

1998-99 Student Demand

Program Applicants	74
Applicants Admitted	68
Total Applicants Denied	6
Qualified Applicants Denied	0
Applicants Enrolled	25

- Students in Program who: Applied for state contract funds: 27
  Received state contract funds: 11

1998-99 Contract Enrollment (Unduplicated Headcount)

ETHNICITY							STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	0	3	5	8	0	16	16	0
MALE	0	0	0	6	0	6	6	0
ALL	0	3	5	14	0	22	22	0

1997-98 Student Credit Hours

Total Student Hours (SCH) – 479

1998-99 Placement of Graduates

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	3	0	0	0	3
FLORIDA	4	0	0	0	4
OUT-OF-STATE	0	0	0	0	0
TOTAL	7	0	0	0	7

Positions:

- Staff Nurse (3)
- May 1999 graduates (4) are in the process of getting licensed.

BARRY UNIVERSITY - BS in Nursing

State Funding

The 1998 Commission recommended $401,005 to support 1,100 student credit hours for the 1999-2000 academic year. The 1999 Legislature, however, appropriated $189,989 for the contract program, the same amount as the previous seven years.

2000-2001 Contract Funding Recommendation

University Request: State support for 521 SCH.

Commission Recommendation: $ 424,105 for 1,100 SCH

2. BARRY UNIVERSITY – MS in Social Work

Contract Summary

- The State contract for Barry University's MSW program was established by the 1979 Legislature at $62,126.

- The MSW contract program responds to the increased demand for professional social work practice in social, health, and welfare agencies. The MSW degree is a prerequisite for social work licensure in Florida.

- The 1998 Five-year review found that social services are in high demand in South Florida where the needs posed by urban poverty, high levels of immigration, a high proportion of senior citizens, and the impact of welfare reform have resulted in an acute shortage of professionally-trained social workers.

- The contract supports a significant proportion of all minority social work students in training statewide.

1998-99 Student Demand

Program Applicants	357
Applicants Admitted	264
Total Applicants Denied	10
Qualified Applicants Denied	10
Applicants Enrolled	210

- Students in Program who: Applied for state contract funds: 220
  Received state contract funds: 69

1998-99 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	0	10	11	31	2	54	29	25
MALE	1	5	3	6	0	15	5	10
ALL	1	15	14	37	2	69	34	35

1997-98 Student Credit Hours

Total Student Hours (SCH) - 622

1998-99 Placement of Graduates

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	18	4	0	3	25
FLORIDA	11	2	0	1	14
OUT-OF-STATE	2	0	0	0	2
TOTAL	31	6	0	4	41

Specific Placement Information (Partial List)

Position	Location
Therapist	Children's Psychiatric Center
Case Manager	Boys Town
Social Work/Grief Counselor	HOPE Hospice
Medical Social Worker	Covenant Home Health and Hospice
Clinical Case Manager	Henderson Mental Health
Family Support Coordinator	Western County Mental Health Center
Consultant	Boys Town
Clinician/Therapist	Therapeutic Alternatives
Psychotherapist	Boca Psychotherapy Center

BARRY UNIVERSITY - MS in Social Work

State Funding

The 1998 Commission recommended $418,419 to support 1,350 student credit hours for the 1999-2000 academic year. The 1999 Legislature, however, appropriated $193,734 for the contract program, the same amount as the previous seven years.

2000-2001 Contract Funding Recommendation

University Request: State support for 1,350 student credit hours

Commission Recommendation: $ 421,807 for 1,350 SCH

D. 1. NOVA SOUTHEASTERN UNIVERSITY – MS in Speech/Language Pathology

Contract Summary

- Following a recommendation by the Commission in 1991, the 1994 Legislature established a state contract for Nova Southeastern University's MS in Speech/Language Pathology for the 1994-95 year at $215,280 to support 30 FTE students.

- The program supports an unmet need for speech-language pathologists in school districts and private sector facilities, particularly in South Florida. There is a critical demand for multilingual/multicultural speech/language pathologists.

- Speech/Language Pathology has been designated a critical shortage area by the State Board of Education.

1998-99 Student Demand

Program Applicants	380
Applicants Admitted	180
Total Applicants Denied	23
Qualified Applicants Denied	0
Applicants Enrolled	180

- Students in Program who: Applied for state contract funds: 120
  Received state contract funds: 44

1998-99 Contract Enrollment

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	Not Reported	ALL	FULL	PART
FEMAL	1	5	10	25	1	42	0	42
MALE	0	0	0	2	0	2	0	2
ALL	1	5	10	27	1	44	0	44

1998-99 Student Credit Hours

Total Student Hours (SCH) - 456

1998-99 Placement of Graduates

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	6	0	0	0	6
FLORIDA	2	0	0	0	2
OUT-OF-STATE	3	0	0	0	3
TOTAL	11	0	0	0	11

Positions (partial list):

Speech-Language Clinician	Broward County School
Speech-Language Clinician	Dade County School
Speech-Language Clinician	Lee County School
Speech-Language Clinician	Palm Beach County School
Speech-Language Clinician	Polk County School

NOVA SOUTHEASTERN UNIVERSITY - MS in Speech/Language Pathology

State Funding

The 1998 Commission recommended $335,958 to support 700 student credit hours for the 1999-2000 academic year. The 1999 Legislature, however, appropriated $215,280 for the contract program, the same amount as the previous six years.

2000-2001 Contract Funding Recommendation

University Request: State support for 700 student credit hours (SCH).

Commission Recommendation: $ 330,715 to support 700 SCH

2. NOVA SOUTHEASTERN UNIVERSITY - Osteopathy

Contract Summary

- The College of Osteopathic Medicine at Nova Southeastern University remains the only college of osteopathic medicine in the Southeastern U.S. The Health Professions Division is now housed in a new facility (a $42 million, one million square feet complex) adjacent to the original Nova University. The mission of the college is to produce primary care physicians that will address the shortage of generalist physicians in Florida.

- The college emphasizes training for family care in rural areas and with high geriatric populations, areas of particular need in Florida. All students take a course in rural medicine followed by a required three-month rotation in a prescribed rural environment. In addition, the college requires a classroom course in geriatrics followed by a mandatory geriatrics rotation. The college also operates two urban clinics in underserved minority communities that are a part of the student rotation.

- The college has established a seven-year track in family medicine (SYFAM) to streamline the educational process to produce family medicine practitioners. In addition to the four-year medical track, internship and residency experiences are included in the program.

1998-99 Student Demand

Program Applicants	3,562
Applicants Admitted	230
Total Applicants Denied	3,157
Qualified Applicants Denied	200
Applicants Enrolled	150

- Students in Program who: Applied for state contract funds: 365
  Received state contract funds: 355

1998-99 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	21	9	20	77	4	131	131	0
MALE	27	9	23	159	6	224	224	0
ALL	48	18	43	236	10	355	355	0

1998-99 Student Credit Hours

Total Student Hours (SCH) - 50 (1st year)

1998-99 Placement of Graduates

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	20	0	0	0	20
FLORIDA	19	0	0	0	19
OUT-OF-STATE	39	0	0	0	39
TOTAL	78	0	0	0	78

NOVA SOUTHEASTERN UNIVERSITY - Osteopathy

State Funding

The 1998 Commission recommended $3,020,375 to support 365 students for the 1999-2000 academic year. The 1999 Legislature appropriated $3,133,900 for the contract program.

2000-2001 Contract Funding Recommendation

College Of Osteopathy Request:

1. State support for 395 students.

2. $8,275 per student capitation (1999 SREB level)

3. Budget request: $ 3,020,375

Commission Recommendation: $3,139,000 to support 365 students

3. NOVA SOUTHEASTERN UNIVERSITY - Pharmacy

Contract Summary

- The Nova Southeastern University College of Pharmacy was established in 1987 and received initial state funding from the 1987 Legislature for 50 students. All students are admitted to the Pharm.D. program.

- In the State University System, both Florida A & M University and the University of Florida have offered the B.S. and Pharm.D. degree programs. As of Fall 1997, the BS degree programs have been terminated (those currently enrolled in the program will still have the option to complete the B.S. degree). 1998 graduates are as follows:

	BS	PharmD	TOTAL
FAMU	27	57	84
UF	26	119	145
TOTAL	53	176	229

- The NSU College of Pharmacy operates with an annual tuition charge and does not calculate tuition in terms of credit hours (full-time equivalent students). Tuition for the 1997-98 academic year is $12,940 for Florida residents and $15,600 for out-of-state students.

- The College reports that the demand for pharmaceutical services is increasing due to the elderly population in South Florida, including the multiethnic and multi-cultural populations, which consumes one third of all medications. The College reports that as the number of opportunities for pharmacists expands to include consulting, nursing homes and HMOs, the demand continues to increase for its graduates.

1998-99 Student Demand

Program Applicants	474
Applicants Admitted	163
Total Applicants Denied	311
Qualified Applicants Denied	261
Applicants Enrolled	120

- Students in Program who: Applied for state contract funds: 118
  Received state contract funds: 115

1998-99 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	29	13	53	107	0	202	202	0
MALE	17	6	28	64	0	115	115	0
ALL	46	19	81	171	0	317	317	0

1998-99 Student Credit Hours

Total Student Credit Hours (SCH) - 8,200

1998-99 Placement of Graduates

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	37	0	3	0	40
FLORIDA	8	0	5	0	13
OUT-OF-STATE	0	0	2	0	2
TOTAL	45	0	10	0	55

Positions (partial list):

Staff Pharmacist
Pharmacy Resident
Clinical Pharmacist
Pharmacy Instructor
Pharmacy Manager
Pharmacy Consultant

NOVA SOUTHEASTERN UNIVERSITY – Pharmacy

State Funding

The 1998 Commission recommended $884,000 to support 260 students for the 1999-2000 academic year. The 1999 Legislature appropriated $838,244 for the contract program.

2000-2001 Contract Funding Recommendation

College of Pharmacy Request: State support for 350 students.

Commission Recommendation: ***$884,000 to support 260 students.***

4. NOVA SOUTHEASTERN UNIVERSITY - Optometry

Contract Summary

- The NSU College of Optometry was established in 1989. Initial state funding occurred in 1990 when the Legislature appropriated $88,500 for 15 optometry students at $5,900 per Florida resident, which was the Southern Regional Education Board (SREB) interstate contracting level.

- The NSU College is the only Florida institution that trains optometrists. The mission of the college is to produce primary care optometrists, particularly to meet the needs of the State's growing geriatric population.

- The 1998 Five-year review found that the College of Optometry Contract Program plays a valuable role in meeting the needs of Florida's optometric workforce requirements and that the contract should continue to be funded.

1998-99 Student Demand

Program Applicants	609
Applicants Admitted	100
Total Applicants Denied	509
Qualified Applicants Denied	29
Applicants Enrolled	102

- Students in Program who: Applied for state contract funds: 160
  Received state contract funds: 131

1998-99 Contract Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE	3	2	3	10	3	21	21	0
MALE	3	0	2	19	2	26	26	0
ALL	6	2	5	29	5	47	47	0

1998-99 Student Credit Hours

Total Student Credit Hours (SCH) - 6,200

1998-99 Placement of Graduates

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL/REGION	3	0	4	0	7
FLORIDA	12	0	0	3	15
OUT-OF-STATE	2	0	0	0	2
TOTAL	17	0	4	3	24

NOVA SOUTHEASTERN UNIVERSITY – Optometry

State Funding

The 1998 Commission recommended $1,048,000 to support 131 students for the 1999-2000 academic year. The 1999 Legislature, however, appropriated $969,400 for the contract program.

2000-2001 Contract Funding Recommendation

College of Optometry Request: State support for 160 students.

Commission Recommendation: ***$1,084,025 to support 131 students.***

IV. CONTINUING CONTRACT RECOMMENDATION

The Commission receives and evaluates proposals annually from independent postsecondary institutions to establish new state contracts. Under the provisions of the governing statutes and rule, these proposals are evaluated in terms of specific criteria, including a clear demonstration of need unmet by the public sector of postsecondary education, an assessment of quality at least equal to what may be expected in the public sector and a determination that the proposed contract is the most appropriate available means of addressing the unmet need. The evaluation includes comparisons with other available public and independent sector alternatives. Upon review and approval by the Commission, a funding recommendation is forwarded to the State Board of Education through the Department of Education's budget to establish a new state contract.

This chapter includes a funding recommendation to establish a state academic contract at Bethune-Cookman College. In 1997, the Commission evaluated a proposal by Bethune-Cookman College to establish a state academic contract for its BS in Specific Learning Disabilities program. Although recommended by the Commission, funds were not appropriated by the Legislature, neither in 1998 nor in 1999, to establish the contract. Below is a brief review of Bethune-Cookman College's proposal and a funding recommendation to establish the contract for the 2000-2001 academic year.

A. BETHUNE-COOKMAN COLLEGE – BS in Specific Learning Disabilities

Program Summary

- The contract program was recommended by the 1997 Commission to address a critical teacher shortage area, as identified by the Department of Education. The Contract was not funded by the 1998 Legislature nor the 1999 Legislature.

- State support through the contracting program will enable more students to receive training in specific learning disabilities to address the significant need for qualified teachers, particularly minority teachers, in these fields.

- Specific Learning Disabilities (SLD) has been designated a critical teacher shortage area by the State Board of Education.

- During its 1997 review, the Commission confirmed that SLD and VE are critical teacher shortage areas and that enabling more students to attend the SLD/VE programs would assist schools in filling the need for more qualified teachers, particularly minority teachers, throughout the state.

BETHUNE-COOKMAN COLLEGE-Bachelor of Science in Specific Learning Disabilities

State Funding

The 1998 Commission recommended $76,190 to support 288 student credit hours for the 1999-2000 academic year. The 1999 Legislature, however, failed to appropriate funds to establish the state contract.

2000-2001 Contract Funding Recommendation

College Request: State support for 20 students at $171,200

Commission Recommendation: ***$81,374 to support 288 SCH.***

APPENDIX A

Five-Year Contract Report Form

FLORIDA DEPARTMENT OF EDUCATION

FORMAT FOR REPORTING INFORMATION FOR FIVE-YEAR PROGRAM REVIEWS OF PRIVATE COLLEGE AND UNIVERSITY CONTRACTS

INSTRUCTIONS: Following the outline below, answer each question and provide the requested information on your contract program. Do not answer on this form, but repeat the outline questions and item headings. Use a separate sheet of paper.

1. Name of institution:

2. College/school & department:

3. Contracted degree program/project name:

4. Project/grant number:

5. Name, institutional title and telephone number of person responsible for the administration of this contract:

6. Date of response:

7. In general terms, describe the nature of the degree program(s), including any unique characteristics or reasons that made this program attractive as a contracted program for the State of Florida.

8. Briefly state the mission of the institution and the major long-term goals of the department. Then, explain how the degree program and the state contract (the project which is the subject of this review) are related to each other and to the long-term goals of the department/school/college.

9. In what ways and to what extent has the State of Florida and its citizens received benefits from this project during the past five years?

10. Please provide a written discussion of future employment opportunities and manpower needs for graduates of the program under review. Provide evidence that verifies and/or demonstrates the extent of local, state, or national manpower needs.

11. What other private or public Florida colleges and universities offer degree programs in the same academic discipline? How does this degree program at this institution differ from other degree programs in the same academic discipline or field of study offered by other private and public Florida colleges or universities?

12. What strategies are used to recruit students into the program (major)? What strategies are used to recruit minority students into the program? Is the tuition differential grant money used as an incentive to recruit additional students into the program? Are transfer students from outside the university required to meet standards that are different from native students to receive tuition differential grants?

13. What criteria are used to determine eligibility and ineligibility of students to receive tuition grants through this project? Are financial need considerations given greater priority than merit? How is the amount of the grant for each participant determined?

17. Extent to which the program is supported by the grant:

a. Number of students (HC=headcount) who actually received reduced tuition benefits through the grant and the number of Funded Student Credit Hours (SCH) during the current and preceding years:

	Full-time Funded HC	SCH	Part-Time Funded HC	SCH	Total HCa (FT+PT)	Total SCHa (FT+PT)
Fall 1994	____	____	____	____	____	____
Fall 1995	____	____	____	____	____	____
Fall 1996	____	____	____	____	____	____
Fall 1997	____	____	____	____	____	____
Fall 1998	____	____	____	____	____	____

b. Number of students (HC=headcount) in the major who did not receive reduced tuition benefits through this project and the number of Non-Funded Student Credit Hours (SCH) during the current and preceding years:

	Full-time Non-Funded HC	SCH	Part-Time Non-Funded HC	SCH	Total HCb (FT+PT)	Total SCHb (FT+PT)
Fall 1994	____	____	____	____	____	____
Fall 1995	____	____	____	____	____	____
Fall 1996	____	____	____	____	____	____
Fall 1997	____	____	____	____	____	____
Fall 1998	____	____	____	____	____	____

c. Ratio of grant-support to total program:

	Headcount HCa/(HCa+HCb)	Student Credit Hours SCHa/(SCHa+SCHb)
Fall 1994	_____	_____
Fall 1995	_____	_____
Fall 1996	_____	_____
Fall 1997	_____	_____
Fall 1998	_____	_____

18. What outreach activities are in place to track the placement (employment) of graduates of the contract program?

19. Number of graduates who received the tuition reduction grants who were employed within one year of graduation:

Year Grad-uated	Number Program Graduates	No. Grant Recipients Graduated	Recipients Employed in Florida	Recipients Employed Outside Florida	Recipients Continuing Education	Number Recip. Unknwn
1993-94	_____	____	_____	_____	_____	_____
1994-95	_____	____	_____	_____	_____	_____
1995-96	_____	____	_____	_____	_____	_____
1996-97	_____	____	_____	_____	_____	_____
1997-98	_____	____	_____	_____	_____	_____

14. At what level are students eligible for tuition differential grants? _____

For the entire degree program for which the contract program provides funds to some of the students, include admissions statistics on the following:

	F 1994	F 1995	F 1996	F 1997	F 1998
Number of New Program Applicants:					
Number of Applicants Admitted:					
Number Admitted and Enrolled:					

Of those Admitted and Enrolled in Fall 1998,
Number receiving tuition grants: _____
Number of Florida residents: _____

15. Time to Degree (1997-98)

a. credit hours taken to complete the degree program:

	average number	highest number
contract grads.	_____	_____
all grads in major	_____	_____

b. Semesters needed to complete the degree program

	average number	highest number
contract grads.	_____	_____
all grads in major	_____	_____

16. Gender and ethnicity of students:

a. Number of students in the major, including students receiving tuition reimbursement grants:

Number of	Females	Males	Am Ind	Asians	Black	Hispanic	White	Other
Fall 1994								
Fall 1995								
Fall 1996								
Fall 1997								
Fall 1998								

b. Number of students receiving tuition differential grants:

Number of	Females	Males	Am Ind	Asians	Black	Hispanic	White	Other
Fall 1994								
Fall 1995								
Fall 1996								
Fall 1997								
Fall 1998								

20. For grant recipient graduates during the past 3 years who were employed in Florida, report the following:

Student ID	Position	Employer	Location	Salary
_____	_____	_____	_____	_____

21. Describe outcomes assessment activities used in your department to assess quality and to measure attained competencies, e.g., certification or licensing examinations for program graduates. Report on the results of these activities.

22. Degree program course requirements

a. Provide a list of courses in the curriculum for the degree program(s) in which students may qualify for tuition differential grants.

b. Describe any revisions that have been implemented in the degree program curriculum during the past five years.

c. Describe the use of educational technology in the delivery of the program.

23. List any new facilities or equipment acquired by this program during the last five years. Briefly describe any facilities or equipment owned or operated by the department that are unique or unusual in this academic field of study.

24. Number of full-time-equivalent faculty & staff dedicated to this degree program:

	Faculty	Support staff
Fall 1994	_____	_____
Fall 1995	_____	_____
Fall 1996	_____	_____
Fall 1997	_____	_____
Fall 1998	_____	_____

25. For each faculty member dedicated to this degree program, indicate length of service, earned degrees, experience, specialization, awards, recognitions, and tenure status. For the degree program faculty, list research, public service, and development activities for the last three years.

26. Operating expenses for the program:

	Capital Equipment	Travel	External Research	Equipmt Maint
1994-95	_____	_____	_____	_____
1995-96	_____	_____	_____	_____
1996-97	_____	_____	_____	_____
1997-98	_____	_____	_____	_____
1998-99	_____	_____	_____	_____

27. Faculty Salaries (Please specify whether this includes all department faculty or only those dedicated to the degree program to which this review applies.)

Average Salaries (current year)

Asst Prof	Assoc Prof	Full Prof
_____	_____	_____

28. Briefly describe the most immediate resource needs of the program.

29. If the tuition differential grant is continued at the current level, do you expect the enrollment to grow or decline and how do you expect the program to develop overall during the next five years?

30. If this project were no longer supported by state funds, what adjustments would be required to maintain the current enrollment and quality of the degree program and the department?

31. 1999-2000 contract funding request

    a. Indicate the number of semester credit hours (SCH) that you are requesting for 1999-2000. If an increase in credit hour support is requested, a written justification should be included.

    b. Estimate the tuition differential cost per student credit hour for 1999-2000.

    c. Estimate the cost of your request by multiplying item 31.a. by 31.b. (a x b=c).

32. Please provide any statistical evidence of student demand and manpower needs for this program and any trend information that may set new priorities within this area of study in the next five to ten years.

OPEC/rtc/rev 6/30/99

APPENDIX B

Annual Contract Renewal Report

POSTSECONDARY EDUCATION PLANNING COMMISSION
ANNUAL CONTRACT RENEWAL REPORT
1998-99

INSTRUCTIONS: Following the outline below, answer each question and provide requested information on your contract program. You may attach additional sheets, but **BE CONCISE.**

CONTRACT PROGRAM: _____

DEPARTMENT/COLLEGE: _____ **INSTITUTION** _____

CONTRACT ADMINISTRATOR: _____

PHONE#: _____ **FAX#** _____

E-MAIL: _____

I. 1998-99 DATA REPORT

A. Total Program Enrollment (all classes) _____ Full-time _____ Part-time _____
Full-time Equivalent (FTE) Enrollment (if available) _____

B. Student Demand - For the total degree program, include the following admissions statistics for the year (Fall, Spring, Summer):

	Total
Program Applicants	
Applicants Admitted	
Total Applicants Denied	
Qualified Applicants Denied	
Applicants Enrolled	

C. Contract Demand - Number of students in your program who *applied for* state contract funds: _____
Number of students who *received* state contract funds: _____

D. 1998-99 Contract-Supported Enrollment (Unduplicated Headcount)

	ETHNICITY						STATUS	
GENDER	ASIAN	BLACK	HISPANIC	WHITE	NOT RPTD	ALL	FULL	PART
FEMALE								
MALE								
TOTAL								

E. Total 1998-99 semester credit hours taken by contract-supported students in program: ☐

F. Headcount ratio of 1998-99 contract-supported graduates to "new" contract-eligible enrollments.

_____

G. Faculty - State the Student/Faculty ratio in the degree program.

_____

H. Placement of Contract-Supported Graduates (From Spring 1998 through 1999).

LOCATION	IN FIELD	NOT IN FIELD	FURTHER EDUCATION	UNKNOWN	TOTAL
LOCAL					
FLORIDA (out-of-region)					
OUT-OF-STATE					
TOTAL					

I. Specific Employment Information on all Contract-Supported Graduates. [If needed, use additional sheets]

Position or Job Title	Employer	Location

J. Tuition 1999-2000 projected price per student credit hour in contract program. (Attach a statement from an **official** college/university publication that verifies the **tuition.**

_____

K. Funding Request for the 2000-2001 Academic Year Specify the number of semester credit hours (SCH) which you are requesting for the 2000-2001 academic year, including costs to maintain the current level of enrollment in the contract program. (Additional credit hours that are requested should be justified in NARRATIVE section.)

II. NARRATIVE REPORT

A. Contracting Procedures	Describe the specific process used to select students to receive state contract funds that are appropriated to your program and specify how the state funds are disbursed to the students.
B. Demand for Graduates	Discuss any changes in demand or employability for graduates of your program during the past year, including national and regional trends in the profession or in the workforce.
C. Faculty	State the size, academic qualifications, and sex/ethnic composition of the contract program instructional faculty for the 1998-99 year.
C. Accreditation	Identify any change in the accreditation status of the institution and the contract program.
D. Outcomes	Describe outcomes assessment activities for the contract program to assess quality and measure attained competencies, e.g., results on certification or licensing examinations, etc. Report on the results of these activities.
F. Overall Academic Program	Discuss any modifications in the program that will affect the State contract, including admission/retention policies, facilities/program resources, recruitment strategies, particularly for minority students, and the use of educational technologies to deliver the program.

Statistical data on contract-supported students collected by the Department of Education's Office of Postsecondary Coordination will supplement the information collected for the academic year 1998-99 and will be used by the Commission for its annual budget request and contract report to the State Board of Education.

Please return the completed report by **May 30, 1999** to:

Dr. Jon Rogers
Educational Policy Director
Postsecondary Education Planning Commission
Ralph Turlington Building
Tallahassee, Florida 32399-0400

Phone No.: 850-488-7894
Fax No.: 850-922-5388
E-Mail: ROGERSJ@mail.doe.state.fl.us

APPENDIX C

Consultant Report: BS in Science Education
Florida Institute of Technology

FIVE-YEAR PROGRAM REVIEW

for the

Florida Postsecondary Education Planning Commission

Florida Tuition Equalization Grant Program
Florida Institute of Technology
Melbourne, Florida

Science and Mathematics Teacher Education Program

Jane Butler Kahle
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May 1999

FIVE-YEAR PROGRAM REVIEW
for the
Florida Postsecondary Education Planning Commission

Florida Tuition Equalization Grant Program
Florida Institute of Technology
Melbourne, Florida

Science and Mathematics Teacher Education Program

Introduction

This report presents the results of the fifth-year review of the Florida Tuition Equalization (FTE) Grant Program for baccalaureate science and mathematics teacher education programs at the Florida Institute of Technology (FIT), a private institution. Through a contract with the State of Florida, the institution receives funds that may be awarded as tuition grants to Florida residents allowing them to enroll in these programs for the same net tuition they would pay to attend similar programs at public institutions of higher education in the state.

The purpose of the review is to make recommendations regarding continuation of the programs based upon educational quality, student demand, and state needs. The review was conducted for the Florida Postsecondary Education Planning Commission and was coordinated by the Florida Department of Education.

Students receiving tuition equalization grants are enrolled in programs leading to Bachelor of Science degrees and teaching certification in grades 6 through 12 in biology, chemistry, earth/space science, physics and mathematics. In addition, bachelor degrees and teaching certification may be earned for middle school science and mathematics (grades 5 through 9) as well as in computer science (grades K through 12).

Review Process

The review of the science and mathematics teacher education program involved an off-site review of pertinent materials as well as an on-site review of staff and program. The on-site review occurred on March 15, 1999. It involved a series of interviews with appropriate faculty, adjunct faculty, graduate assistants, Florida Institute of Technology (FIT) administrators, students, and alumni. This report is based on both parts of the review process and involves some comparisons to the two previous five-year reports, 1989 and 1994, both of which were written by Dr. Kahle. Indications of progress as well as any continuing concerns will be discussed in each section of this report. FIT's program will be analyzed in relation to

national patterns in science and mathematics teacher education programs and recommendations will be made.

In preparation for the site visit, the following materials were reviewed:

- FLORIDA DEPARTMENT OF EDUCATION: Information for five-year program reviews of private college and university contracts
- Two sample Program Review Reports
- Two previous Program Review Reports for the Science and Mathematics Teacher Education Program at FIT
- Curriculum vitae for all of the current staff
- FIT Teacher Education Program Evaluation Plan, 1997-98
- All degree programs in the Department of Science and Mathematics Education
- FIT University Catalog, 1999-2000.

In addition, the following people were interviewed as part of the site visit:

- Dr. Bob Fronk, Department Head
- Ms. Debra Blenis, Director of Teacher Education
- Dr. Michael Gallo, Associate Professor of Mathematics Education
- Dr. Torn Marcinkowski, Acopian Program Chair and Associate Professor of Environmental Education
- Dr. Andrew Revay, Vice President for Academic Affairs
- Dr. Gordon Nelson, Dean, College of Science and Liberal Arts
- Dr. Pat Shelton, Staff Development Specialist, Brevard county School District
- Ms. Carolynn Howell, Adjunct Professor and science teacher, Palm Bay High School
- Mr. Robin Novelli, Assistant Principal, Palm Bay High School
- Mr. Richard Regan, Adjunct Professor and instructional technology teacher, Stone Junior High School
- Undergraduate and graduate students in the Science and Mathematics Teacher Education Program.

The visiting team included: Dr. Nate Johnson, Mr. Taylor Cullar, and Dr. Jon Rogers, all of the Florida Department of Education, and Dr. Jane Butler Kahle.

Educational Program Quality

The Science and Mathematics Teacher Education Program is a program in the Department of Science and Mathematics Education that is part of the College of Science and Liberal Arts at FIT. In the past, as well as for this review, the academic home of the program is seen as a strength. First, because of its academic location, all secondary mathematics and science teaching programs include extensive course work in science and mathematics. Most courses are ones that science and mathematics majors take; that is, they are not special courses for education majors only. In addition, the various science and mathematics teacher education programs have a solid and strong discipline emphasis. For example, prospective biology teachers at FIT take a year of both calculus and physics. In addition, the mathematics education program does not include any special courses for education majors, a practice common at other institutions. It is estimated that approximately 75% of the courses taken by science and mathematics education majors are taught outside of the Science and Mathematics Education Department.

However, the anticipated (and previously recommended) increased collaboration between faculty in the Department of Science and Mathematics Education and the discipline departments has not occurred. Programs in both could be enhanced by shared or collaborative teaching. In addition, recruitment and retention could be facilitated by joint appointments that allowed faculty in the disciplines as well as those in science and mathematics education to be more cognizant of each other's programs. In order to decrease class size and to eliminate a heavy reliance on adjunct faculty, the Department of Mathematics is hiring four new faculty, two of whom will be mathematics educators, whose research and scholarship will be in mathematics education. Yet, when queried about whether the new mathematics educators would be involved with teacher education, the response was negative. This situation results in a lost opportunity to increase the connections between teacher education and the discipline departments.

Because FIT students declare their majors as entering freshmen, another strength of the teacher preparation program is the number of hours in clinical field experiences. Indeed, science and mathematics education majors participate in secondary classrooms as early as their freshman year, and they have continuous experiences throughout their undergraduate

education. This model is highly promulgated by many educational reforms, but it is seldom achieved due to the traditional practice of declaring a major at the end of the sophomore year.

Programs in mathematics were based on the national Council of Teachers of Mathematics (NCTM) standards, although there was no mention of the comparable National Research Council's (NRC) standards in science. Since the last review, programs have been changed to include an expanded measurement/evaluation/assessment two-course sequence. That sequence helps to bring the programs into alignment with national programs and state and national standards in both areas.

One new strength of the program is the hiring of Ms. Diane Blenis, an FIT graduate and former teacher, as the Director of Teacher Education. She supervises the student teaching and internship programs. An energetic professional, Ms. Blenis is able to communicate with both teachers and administrators as well as to guide FIT students during their practicum experiences. The consistency of her guidance across a variety of field experiences provides students with a mentor.

The program is State approved, its graduates qualify for the Interstate Agreement on Qualifications of Educational Personnel. The program is restricted to secondary certification (grades 5 through 12) and is closely related to school and district programs in the surrounding county. FIT has been successful in attracting high quality students both nationally and across Florida, and the teacher education program benefits from that success, particularly in upper-class transfers to the program. Most of the teacher education graduates, and almost all of the students receiving Tuition Equalization grants, teach locally. However, recent FTE recipients have chosen to work in community colleges, private schools, and informal education settings. Therefore, the Department's claim that its program is helping to meet the demand for certified mathematics and science teachers is questioned. However, in general, the FIT program contributes to the total talent pool of science and math teachers in Florida – beyond those that receive FTE grant assistance.

Faculty: The full-time faculty members hold doctoral degrees from recognized science and mathematics graduate programs. The full-time director of Teacher Education holds a Master of Science degree from FIT. Adjunct faculty are practicing teachers in the area, who have appropriate degrees, certification, and practical experience. All full-time faculty are active in seeking external grants, writing scholarly as well as practical papers, participating in appropriate professional associations, and presenting workshops and papers for Florida's

teachers. As discussed above, none teach science, mathematics, or computer science within a discipline department, although one teaches computer science at Rollins.

A continuing concern since the last review is the lack of integration of adjunct faculty into the program. These faculty supervise field experiences and teach methods of teaching courses in mathematics and science. Discussions with current adjunct faculty indicated that although adjunct faculty meet together to discuss programs and students, they do not regularly attend departmental faculty meetings. The use of classroom teachers as adjunct faculty to instruct pedagogical courses and to supervise field experiences reflects a national trend, one that is generally regarded as an improvement in the preparation of teachers. However, for this system to work best, there need to be formal avenues for integrating adjunct and full-time faculty. Programs may be strengthened or revised if adjunct faculty were involved in program decisions.

Administration: Administration at the Department level is excellent, and there appears to be commitment at the College and University levels.

Facilities: In general, both classroom and office facilities are adequate. One improvement has been to transfer all methods' courses to local junior and senior high schools. That transfer has negated the need for a teaching laboratory. Although the Department's computer facility was considered very adequate during the first review (1989), it now needs updating and renovating. In addition, both new hardware and software are needed. A good high school would have a better computer laboratory than the one in the Department.

Students

A discussion with students revealed other aspects of the program. Specifically, talented high school graduates, who have opportunities to attend out-of-state universities and colleges, remain in Florida because of the financial assistance they receive through the tuition reimbursement grants. Several students interviewed were non-traditional students (mature students). They emphasized that they would not have become teachers without FTE assistance. All students and alumni mentioned the discipline orientation of the program, stating that they took more content courses than their peers in science and math teacher education programs at other Florida institutions, such as the University of Central Florida.

During the last review, students and alumni indicated that their FTE grant assistance encouraged maximum enrollments each semester (cost/credit hour tuition). Therefore, one

unexpected benefit (for both the prospective teachers and their future employers) was that most graduate with certification in more than one science content area or with a combination of science and mathematics certification. In addition, many are certified to teach at more than one educational level (middle as well as senior high school). Particularly in small schools, or for elective courses such as physics and pre-calculus, the ability to hire well prepared teachers with dual certification is important. Although that result is not the expressed intent of the FTE grant to FIT, it was an important educational outcome. It was unclear during the current review if the new way of calculating payment (flat rate tuition) will have the same result. The effects of method of calculating payment on student programs and certification areas should be monitored for maximum impact.

The FTE grant to FIT has added to Florida's pool of highly competent science and mathematics teachers. Currently seven students, five of whom are transfer students, are recipients of FTE grants. In the last three years, 13 grant recipients have graduated, eight of whom are employed in Florida, one is employed outside of the state, two are continuing their education, and the location of two others is unknown. Of those employed in Florida, one is in a private school, one in a community college, one in an informal science center, and two teach in public schools. Four of the five are employed in Brevard County. Since the last review, FIT has not increased the number of minority students receiving FTE grants. Data indicate that only one African American received FTE support since 1994. The programs enroll women to men in approximately a 2 to 1 ratio.

FTE assistance is based on merit and transfer students external and internal to the university are treated the same in terms of receiving FTE grants. As one student stated, "The quality of FIT programs attracts them to the institution, the FTE support keeps them there."

Student Recruitment: FIT's Director of Admissions is directly responsible for recruiting in the state of Florida. She has created financial aid brochures and special mailings to all Florida schools in order highlight the program. Although the FIT Financial Aid Office coordinates a separate scholarship for minority students in the Science and Mathematics education Department that provides tuition relief in addition to the Tuition Equalization Grant, the program has not been successful in increasing the number of minority participants.

Demand for Graduates

In the documentation for the program review, data concerning the shortage of certified science and mathematics teachers in Florida is cited. Because this is a national problem, it is

unlikely that Florida will be able to recruit adequate numbers of certified teachers from elsewhere. However, FIT's graduates who receive FTE support overwhelmingly stay in Brevard County, so the appropriate data to consider are those in Brevard County. Given that two of the five recent graduates, for which there are data, took positions in parochial schools or informal science centers (usually lower paying positions than public school teaching), one questions the need in Brevard County. To meet Florida's needs, FIT may need to place it's student teachers in geographically diverse areas as well as to recruit prospective teachers from a wider range of communities.

The recent proposal to increase the FIT's Tuition Equalization grant in science and mathematics teacher education to accommodate 18 students (currently 6 are supported) is directed at meeting the short-fall of certified mathematics and science teachers in the state. Although the additional students could be accommodated in the various programs without compromising the quality, rigorous recruitment and placement activities would be needed also.

School personnel stated that FIT graduates were very well prepared, one comparing them favorable to Central Florida University graduates and one stating that they were comparable.

Conclusions and Recommendations

The Florida Tuition Equalization Grant program for baccalaureate science and mathematics teacher education programs at the Florida Institute of Technology helps to provide the state with a cadre of teachers who have outstanding content backgrounds and extensive experiences in schools. Nationally, research is indicating that teachers with that type of preparation are more effective in classrooms and that their teaching enhances the learning of students[1].

The program appears to be well managed and to fulfill the intent of the enabling legislation. It is recommended that this program be continued for an additional five years. However, if the level of funding is increased, there should be new expectations, or requirements.

---

[1] Cohen, D. K., & Hill, H. (1997). Instructional policy and classroom performance: The mathematics reform in California. Unpublished manuscript.

Damnjanovic, A. (1998). Ohio Statewide Systemic Initiative (SSI) factors associated with urban middle school science achievement: Differences by student sex and race. Journal of Women and Minorities in Science and Engineering, 4, 217-234.

Monk, D. H. (1994). Subject area preparation of secondary mathematics and science teachers and student achievement. Economics of Education Review, 13, 125-145.

Specifically, recruitment should be more extensive and student teaching placements should reach to diverse geographical regions in Florida. In addition, adjunct faculty should be involved in programmatic decisions. However, the program, with FTE support, is not helping Florida to diversify its pool of mathematics and science teachers. Although this task is very difficult, FIT with the support of the FTE grants should be able to make better progress.

Jane Butler Kahle, Consultant

5/25/99
Date

APPENDIX D

Consultant Report: BS in Industrial/Manufacturing Engineering
University of Miami

FIVE-YEAR PROGRAM REVIEW
for the
Florida Postsecondary Education Planning Commission

Florida Tuition Equalization Grant Program
University of Miami
Coral Gables, Florida

Baccalaureate Program in Manufacturing Engineering

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March 1999

PROGRAM REVIEW
of the University of Miami
Baccalaureate Program in Manufacturing Engineering
Coral Gables, Florida

Florida Tuition Equalization Grant Program

by

J T. Black, Consultant

Introduction

This report presents the results of a fifth-year review of the Florida Tuition Equalization Grant Program for the Baccalaureate Program in Manufacturing Engineering at the University of Miami, a private institution. Through a contract with the State of Florida, the institution receives funds that may be used as tuition grants for students who are Florida residents. These funds allow them to enroll in the manufacturing engineering program for the same net tuition they would pay to attend a similar program at public institution in the state, if such a program existed.

The purpose of the review is to make a recommendation regarding continuation of the program based upon educational program quality, student demand, and demand for the students by South Florida industry. The review was conducted for the Florida Postsecondary Education Planning Commission and was coordinated by the Florida Department of Education.

Students receiving tuition equalization grants are enrolled in the program leading to the degree of Bachelor of Science in Industrial and Manufacturing Engineering. Both the IE and Manufacturing Engineering program at the University of Miami is ABET accredited.

> The University of Miami's Manufacturing Engineering Program has been well established for many years with a unique character and outstanding faculty. The undergraduate program is one of only sixteen EAC/ABET accredited manufacturing programs nationwide. There is no comparable program in the State of Florida. It presents a special strength in the armor of Florida education to keep up with the fast pace of technological development and to be able to support its industrial growth in a globally competitive marketplace.

Recognizing the changing needs of U of Miami's customers, the companies, graduate schools, and research institutions, the long term goals are:

- To be the manufacturing educational and research institution of excellence in the State of Florida from which local, and state companies recruit talented manufacturing engineers.

- Achieve national and international recognition for the manufacturing program both at the undergraduate as well as at the graduate levels.

- Meet the needs of manufacturing companies in South Florida with qualified graduates:

The state contract allows a large number of talented students of a diverse social background to be enrolled in the Manufacturing Engineering program at the University of Miami. The quality of the graduates has generated interest on the part of companies as well as national organizations (i.e., Society of Manufacturing Engineering) in assisting in the further development of the program. Since 1993, the Department has invested more than $580,000 (excluding the state contract) in building the manufacturing program and its associated laboratories. The long term goals of the Manufacturing Engineering Program at the University of Miami can be achieved only if they can continue to attract talented students that would otherwise not be able to attend the University of Miami because of its significantly higher tuition. The state subsidy program is critical to the continued health of the program.

No other private or public Florida colleges or universities offer degree programs in Industrial Engineering with an accredited program in manufacturing engineering.

This report has been prepared by J T. Black, consultant for the review, and is based on review of materials furnished by the institution, a site visit, and a comparison of program characteristics with two other accredited engineering program in Florida, also visited by the consultant.

Site Visit

The site visit to the University of Miami took place on March 25, 1999. The review team was composed of Mr. R. Taylor Cullar, Educational Policy Analyst, Florida Department of Education, Dr. Nate Johnson, Program Specialist, Florida Department of Education and J T. Black, consultant. The team met with Dr. Steven Ullmann - Vice President; Dr. Samuel Lee - Associate Dean, College of Engineering; Dr. Norman G. Einspruch - Chairman; Dr. Nourredine Boubekri - Director, Manufacturing Engineering; Dr. Mohamed Fahmy - Research Associate. These people represented the administration in charge of this program.

Next the team met with some of the 35 current students in the program. The following students were at the meeting: Jorge Alvarez, Rich Cardorra, Eric Costellanos, Alesha Dempster, Derek Fisher, Lewis Fefteroff, Jorge, Gomed, Vanessa McCoville, Liberatad Montealegre, Cliff Richards, Jamie Rodriguez, Michelle Tavares, Leticie Triana. All but one of these 13 students were receiving the subsidy. As a group they expressed grateful thanks to the state of Florida for the financial assistance, stating it was critical to their decision to enroll at the University of Miami in this program. Many of them spoke of the high quality of the program; the hands-on aspects of the technical courses; the personal first-name basis of the relationship with the faculty' and most significantly the small classes at the University of Miami.

The committee met with some recent graduates, alumni of the program. Attending were Peter Delogu - Motorola, Inc., Olivier Lemoine - Renard Mfg, Inc., Antonio Livermore - Goulde Pumps, Inc., Robert Slazes - Cordis - Johnson & Johnson, Marcelo Sustaz - American Express. All of these alumni had received the subsidy and stated that it was critical to their getting jobs, that the degree helped tremendously, that the degree is well regarded in the community. These students view themselves as Industrial Engineers with strong manufacturing expertise and they all made a very strong pleas to keep the program going. It also appeared to the team that most of the graduates tended to stay in South Florida.

The committee also spoke (via telephone, or in person) with 3 people who represented the companies who had hired these graduates. Again, the team heard nothing but praise for the preparation and knowledge of the graduates from this program. The committee spoke with Mr. Frank Bernel with Motorola; Mr. Armando Graupera with Cordis, Inc. (also involved with the IE's as a mentor on senior design profjects and manufacturing design - assigns actual parts of projects); Mr. John Kubin with UPS.

The team interviewed the following faculty members: Dr. Norman G. Einspruch, Dr. Shihab Asfour, Dr. Nourredine Boubekri, Dr. Eleftherios Lakovou, Dr. Tarek Khalil, Dr. David Sumanth. This is a very professional faculty with extensive manufacturing background (many have production engineering degrees which is the European equivalent of the B.S. Manufacturing Engineering degree). The faculty is readily available to the students and appeared to know them by name. This faculty has great research expertise in the ergonomics and human factors areas. In developing this program, the faculty targeted the small to medium sized manufacturing companies in South Florida, particularly those in the growing medical device field. They believe their program produces a very practical engineer who wants to work as an engineer in manufacturing. Four key courses IEN 407 Product Design for Manufacturing, IEN 505 Robotics, IEN 507 Design of Manufacturing Systems, IEN 509 Automated Assembly are particular to this degree program and typically include projects with these small to medium sized companies. The texts used in these courses are all modern and up-to-date. While specific course materials were not reviewed, this consultant believes that the courses are excellent ones, based on a previous visit to this school in 1993 as an ABET evaluator for SME.

Program Quality

The consultant's evaluation of educational program quality is based on the materials provided by the institution documenting curricular requirements and faculty credentials, discussions with students and program chairs, and comments of employers on the performance of University of Miami engineering graduates.

In this consultant's judgment, the University of Miami's baccalaureate engineering program in Industrial Engineering with Manufacturing Engineering is of good quality. The program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology, Inc., (ABET), which signifies that the programs satisfy acceptable quality criteria in the areas of students, faculty, curriculum, facilities, administration, and institutional commitment. These criteria include provisions applicable to all engineering programs as well as those specific to the individual disciplinary degrees offered. Graduates of these programs should be adequately prepared to begin the practice of engineering at an entry level. EAC/ABET accreditation satisfies the requirements of all state engineering registration boards for educational preparation needed to begin the examination process leading to registration as a professional engineer. The program has recently undergone another ABET review and reaccredited. With regard to the particular areas covered by the accreditation criteria:

Faculty – All the full-time faculty members hold doctoral degrees from recognized engineering graduate programs. The number of full-time faculty in the program is adequate to cover the required subject areas. In this evaluators opinion, they could use another faculty member with manufacturing systems expertise and have plans to hire another faculty member who will begin in the fall of 1999.

Students – Students interviewed appeared well qualified to succeed in engineering studies and were mature. Many already had significant industrial exposure.

Administration – Administrative leadership at the divisional, college, and institutional levels appears committed to the continued support and development of the undergraduate manufacturing engineering program.

Curriculum — The baccalaureate manufacturing engineering curriculum is excellent in terms of coverage and is typical of accredited engineering programs at other institutions. The number of semester credit hours required in the program, 128, is also typical of that for other accredited programs.

Facilities – The laboratory facilities for the manufacturing engineering programs were acceptable although minimal. Additional manufacturing processes in the forming area or processes which are typical in the medical device manufacturing community may be the way to go.

Demand for Graduates

This evaluator can only speak from 39 years of experience in this area since I can only rely on data provided by the March 1, 1999 self study, page 16. My experience has been that there has always been and will continue to be demand for engineers who know how things are made - aka manufacturing engineers. The creation of wealth, the very heart of the standard of living, is based on either agriculture, mining or manufacturing (fabrication, building, construction, etc.). Such engineers can always get a job because companies who make things always need this kind of engineer. Every graduate from this program has been able to get a job or go to graduate school.

Comparison with Florida Atlantic University (FAU)

Florida Atlantic University in Boca Raton has a mechanical engineering department and they teach two courses in manufacturing processes and one laboratory course. All these courses are electives. FAU does not have a program which remotely compares to the University of Miami's ABET accredited program in manufacturing engineering.

Comparison with Florida International University (FIU)

Florida International University has an Industrial Engineering department which offers a course in manufacturing processes and a course in industrial automation at the undergraduate level. These courses are required and approximately equivalent to the University of Miami's IEN 306 and IEN 406. At the undergraduate level, they do not appear to have required undergraduate courses in IEN 509, Automated Assembly; IEN 407, Product Design for Manufacturing; IEN 505, Robotics; and IEN 507, Design for Manufacturing Systems.

FIU has a manufacturing engineering masters degree program which does have courses in product design for manufacturing, manufacturing process selection, manufacturing systems and robotics. This is a graduate program and is not accredited by ABET. FIU does not have a program equivalent to the University of Miami's undergraduate manufacturing engineering program although they do have some equivalent courses at the graduate (MS) level.

FIU and FAM are the only universities in South Florida that have course work in manufacturing aside from the University of Miami. However, for the engineering student who wants the ABET accredited degree program in manufacturing engineering, there is no other alternative in the state of Florida, nor the states of Alabama or Georgia.

Summary

This evaluator finds the University of Miami's Industrial Engineering program with Manufacturing Engineering to be well run by a professional faculty, to have adequate facilities, to have good students and to be graduating about 5 to 8 students per year who are getting good jobs in the South Florida area. The degree and the University is well respected by the students and local industry and by faculty at other local universities having engineering programs. I believe that the present and future need for these graduates will continue and strongly recommend that this subsidy program be continued as it clearly has served as a strong enticement and recruiting tool for the program.