A NEW DEGREE PROGRAM

REQUEST FOR AUTHORIZATION TO IMPLEMENT

Florida International University **University Submitting Proposal**	August 1997 (Fall) **Proposed Implementation Date**
Mechanical Engineering **Name of Department(s)**	College of Engineering & Design **Name of College or School**
B.S. in Chemical Engineering **Complete Name of Degree**	CIP Code = 140701 **Academic Specialty or Field (Include CIP Code)**

The signing of a proposal to implement constitutes a commitment by the university that, if the proposal is approved, the necessary financial commitment and the criteria for establishing new programs have been met prior to the initiation of the program.

Vice President Academic Affairs	**President**
Date 9/30/97	**Date** 9/30/97

Indicate the dollar amounts appearing as totals for the first and the fifth years of implementation a shown in the appropriate summary columns in BOR Table Three. Provide headcount and FTE estimates of majors for years one through five. Headcount and FTE estimates should be identical to those in BOR Table One.

	Total Estimated Costs	Projected Student HDCT / FTE
First Year of Implementation	$450,566	64 / 32
Second Year of Implementation		82 / 42.5
Third Year of Implementation		106 / 53
Fourth Year of Implementation		125 / 62.5
Fifth Year of Implementation	$553,166	144 / 72

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I. ABSTRACT

This is a request to the Board of Regents for authorization to implement a BS in Chemical Engineering Program at Florida International University. The proposed program will be offered by the Department of Mechanical Engineering of the College of Engineering, Florida International University.

This is a 128 credit hour degree program leading to a degree at the baccalaureate level. The student that graduates from this program will have a strong foundation in calculus; the basic sciences and humanities; chemistry, including organic and physical chemistry; computer science; engineering science and design; and chemical engineering. The major emphasis within the program will be initially geared towards FIU College of Engineering expertise as well as local industry needs, and will include the areas of biotechnology, environmental science, pharmaceutics, and chemical processing.

One of the objectives of the College of Engineering at FIU is to offer degree programs in those areas where a significant local, state, and national need has been demonstrated. Chemical Engineering is such a program. As shown in the feasibility/planning proposal, this program is in demand in Florida, as indeed, it is in the entire nation. The chemical engineering area of study is particularly important to industry, and a primary objective of the One Community - One Goal Project of the Greater Miami Chamber of Commerce which is to bring more biotechnology industry to Dade County. It is important to the community that chemical engineering degrees be available locally.

Six of the current Mechanical Engineering Department faculty will devote a total of 0.7 FTE to the new program. Five new faculty members, with a total of 3.05 FTE effort directed towards the new program, will be recruited over the first three years of implementation. This will result in a total of 3.75 FTE faculty members (five nine-month faculty) devoted exclusively to the new program (see BOR Table Two).

The new Center for Engineering and Applied Sciences provides the additional space required for teaching and research associated with the new program. Funding for program expenses and capital costs for developing teaching laboratories is requested in addition to faculty and staff salaries (see BOR Table Three). However, student enrollment is anticipated to be at such a level by year five of the implementation that student-generated resources will be sufficient to fund the program (see BOR Table One).

II. PLANNING PROCESS DESCRIPTION

In effect, planning for a BS program in Chemical Engineering began at the inception of the College of Engineering, for which Chemical Engineering was intended to be one of the basic engineering programs along with Civil, Electrical, Industrial, and Mechanical Engineering. A 1988 SUS Program Review recommended delay of the Chemical Engineering Program because of insufficient resources and space in the College at that time, and the need to concentrate on the

existing programs. A subsequent 1994 review, led by Leroy S. Fletcher, Ph.D., Mechanical Engineering Professor at Texas A & M, remarked that there was now a strong case for the development of a BSChE because of the growth of the biotechnology, pharmaceutical, and environmental industries in South Florida and the lack of other programs in the region. As a result, a feasibility and planning study was conducted by the group of ME faculty with interests in the BSChE program (see BOR Table Two), led by Richard T. Schoephoerster, and submitted to the BOR in June 1995. Because of limited resources and higher priority put on the development of Ph.D. programs in CE and IE, the BOR delayed authorization to implement until January 1997. A new Chair had just been appointed to the Mechanical Engineering Department, Richard Irey, and he assumed full responsibilities for leading the continued development of the new program. A delay of six months was requested before submitting the implementation proposal to allow time to finish the move to, and renovation of the CEAS before actual implementation of the program. Renovations are currently underway and we will be fully prepared to implement the new program in the Fall 1998 term.

III. CHANGES FROM FEASIBILITY/PLANNING PROPOSAL

A. Data Changes:

No changes have occurred in the institutional mission, characteristics of the program, or anticipated enrollments since the preparation of the feasibility/planning proposal. A significant change has occurred in the space needs through the acquisition of the CEAS. This new facility contains all of the requisite space for the new program.

B. Resources Changes:

Resources required for the program have not changed from the feasibility/planning proposal. The format for the tables has changed since preparation of the feasibility/planning proposal, and so we include the newly formatted BOR Tables One, Two, and Three for reference.

IV. CURRICULUM

A. Sequenced Course of Study:

Table IV-1 provides a list of the courses that comprise the curriculum plan. The total curriculum is 128 hours, which is the same as the other engineering programs in FIU's College of Engineering. It is also comparable or below the requirements for the other two Chemical Engineering programs in the state.

The program includes 20 credits of required course-work that will have a chemical engineering prefix. The 3 to 5 credits of technical elective credits will generally have a ChE prefix. In addition the program requires 13 credits with mechanical engineering

prefixes that are virtually identical to courses often given ChE prefixes in existing ChE programs. (Namely, EML 3301L,EML 3343, EML 3126 and EML 3126L, EML 4140, and EML 4312.) All of these courses will include examples representative of chemical engineering applications. Heat Transfer will include a limited number of mass transfer applications as well. Thus the program effectively contains 36 to 38 credits in what should be considered the major. Chemical engineering is built on a very strong chemistry base. The proposed program includes 24 chemistry credits plus the option to take either 5 additional hours of physical chemistry or equivalent hours of biochemistry, biology or human physiology. The purpose of these options is to allow students to develop biomedical engineering background to apply their chemical engineering training in this rapidly growing field that is centered in the Dade-Broward county area.

B. Credit Hour Exception:

Table IV-2 provides a potential course sequence that meets pre- and co-requisite requirements.

As noted above, every BS program both at FIU and throughout the state and the overwhelming majority nationwide require at least 128 credits which is the total requested in this program. This is now the agreed upon standard for engineering programs for state supported programs of engineering in Florida. It is not possible to do an ABET accreditable ChE program in fewer hours.

C. Course Descriptions:

Lower division courses including calculus through differential equations (MAP 2302), General Chemistry I and II with labs (CHM 1045, 1045L, 1046 and 1046L) and physics I and II with labs (PHY 2048, 2048L, 2049 and 2049L) are standard prerequisite courses that are included in the state mandated junior college transfer module for chemical engineering. (All of these courses except General Chemistry II and lab are required for all other engineering majors at FIU.) Similarly, the required English composition courses and the humanities/social science electives (18 cr) are standard for ABET accreditable engineering programs throughout the state and nation as well as all other engineering programs at FIU. Course descriptions for these courses are not provided.

Table IV-3 provides a brief description of each required upper division course required in the proposed chemical engineering program plus the required lower division courses not mentioned above.

D. Common Prerequisites:

The proposed program accepts the state agreed upon prerequisites which are: CHM 1045, 1045L, 1046 and 1046L; MAC 2311, 2312 and 2313, MAP 2302; and PHY 2048, 2048L 2049, 2049L

E. Limited Access:

Limited access status is not sought.

V. EO IMPACT STUDY

A. Current Level of Board Review:

Implementation

B. Type of Action Proposed:

New Program

C. Program Duplication Issues:

The existing state supported Chemical Engineering Programs are at UF FAMU/FSU and USF. As was addressed in the EO Impact study submitted with the Feasibility Study earlier, none of the other three ChE programs attract Hispanics in significant numbers. FIU's track record in its existing engineering programs is that about half of its graduates are Hispanic. Therefore, it is reasonable to expect that about half of the graduates of the proposed Chemical Engineering Program will be Hispanic. This will significantly increase the number and proportion of Hispanic chemical engineers being produced by the state.

The combined proportion of black chemical engineering graduates being produced by the three existing institutions was 13% for the 1993/94 academic year studied. FAMU/FSU at 26% and USF at 17% produced most of these graduates. FIU with about 7% black engineering graduates should contribute to the production of black chemical engineers in the state but probably not at the rates achieved by FAMU/FSU or USF in the reported year.

In addition, women are under-represented in engineering. Nationally Chemical Engineering Programs attract the highest proportion of women among undergraduate engineering programs, about 30%. Therefore, establishing a ChE Program at FIU should enable the College of Engineering to increase the number and proportion of women that it graduates. Further recognizing that FIU attracts a high proportion of

Hispanic students, it is reasonable to expect that many of the women who will enroll in FIU's ChE program will be Hispanic. Establishing a Chemical Engineering Program at FIU would be expected to attract more Hispanic women into engineering in the state.

Will a Chemical Engineering Program at FIU diminish the enrollment of minorities in the existing ChE Programs? As noted above, none of the three existing programs has appreciable Hispanic enrollment. Therefore the expected increased Hispanic enrollment that is expected in the FIU ChE Program will be very unlikely to influence the Hispanic enrollment at any of the other institutions. As note above, black enrollment in ChE is small at UF but more substantial at FAMU/FSU and USF. Potential black ChE students from south Florida may be attracted to the FAMU/FSU program because it is a traditionally black institution. Such students would be unlikely to enroll in FIU's ChE Program. On the other hand, black students in the south Florida that are looking for a convenient place to study chemical engineering would be likely to enroll in FIU's program when it has one. This program will make it possible for such students to realize their goal of becoming a chemical engineer. Similarly, the women that FIU expects to attract into its Chemical Engineering Program would not be expected to be drawn from the group of women who would go to one of the three existing ChE Programs. It is far more likely that they will come from women who are seeking an attractive academic program in south Florida.

D. Rationale for Duplications:

No program duplication is anticipated.

E. Corrective Strategies for Duplication:

No program duplication is anticipated.

APPENDIX

Table IV-1
Chemical Engineering
Baccalaureate Curriculum by Area

ENGLISH

ENC 1101	Freshman Composition	3
ENC 1102	Literacy Analysis	3

HUM/SOCIAL SCIENCE

SLS 1501	Freshman Exp. Seminar	1
	Humanities/Social Science	18

MATH/COMPUTER

MAC 2311	Calculus I	3
MAC 2312	Calculus II	5
MAC 2313	Multivariable Calculus	3
MAP 2302	Differential Equations	3
CGS 2423	C for Engineers.	3

PHYSICS

PHY 2048	Physics I (with Calculus)	5
PHY 2048L	Physics I Lab	1
PHY 2049	Physics II (with Calculus)	5
PHY 2049L	Physics II Lab	1

CHEM/BIOLOGY

CHM 1045	General Chemistry I	4
CHM 1045L	General Chemistry I Lab	1
CHM 1046	General Chemistry II	3
CHM 1046	General Chemistry II Lab	1
CHM 2210	Organic Chemistry I	4
CHM 2210L	Organic Chemistry I Lab	1
CHM 2211	Organic Chemistry II	4
CHM 2211L	Organic Chemistry II Lab	1
plus		
CHM 3411	Physical Chemistry II	5
CHM 3411L	Physical Chemistry II Lab	1
or		
BCH 3033	General Biochemistry	4
BCH 3033L	General Biochemistry Lab	1
or		
BSC 1010	General Biology I	3
BSC 1010L	General Biology I Lab	1
or		
PCB 4733	Human Systemic Phys. I3	
PCB 4733	Human Systemic Phys. I Lab	1

ENGINEERING

EGN 1100	Introduction to Engineering	1
EGN 1110C	Engineering Drawing	0
EEL 3003	Electrical Engineering I	3
EEL 3003L	Electrical Engineering I Lab	1
EIN 3354	Engineering Economy	3

ENGINEERING MECHANICAL

EML 3343	Thermodynamics I	3
ECH 3xx1	Thermo II for Chem Engr	3
EML 3126	Transport Phenomena	3
EML 3126L	Transport Phenomena Lab	1
EML 4140	Heat Transfer	3
EML 3301L	Instrument. and Meas. Lab	1
EML 4312	Automatic Controls	3

ENGINEERING CHEMICAL

ECH 3xx2	Chemical Reaction Engr	3
ECH 3xx3	Dsgn of Staged Separ Proc	3
ECH 4xx1	Dsgn of Chemical Engr Proc	3
ECH 4xx1L	Chemical Engineering Lab I	2
ECH 4905	Senior Design Project I	1
ECH 4xx2L	Chemical Engineering Lab II	2
ECH 4905	Senior Design Project II	3
ECH 4xx4	Technical Elective	3 or 4 or 5

Table IV-2
Chemical Engineering
Baccalaureate Curriculum In Sequence

First Semester: (16)

MAC 2311	Calculus I	3
CHM 1045	General Chemistry I	4
CHM 1045L	General Chemistry I Lab	1
ENC 1101	Freshman Composition	3
	Humanities	3
EGN 1100	Introduction to Engineering	1
EGN 1110C	Engineering Drawing	0
SLS 1501	Freshman Exp. Seminar	1

Second Semester: (17)

MAC 2312	Calculus II	5
CHM 1046	General Chemistry II	3
CHM 1046	General Chemistry II Lab	1
CGS 2420	Programming for Engineers.	3
ENC 1102	Literacy Analysis	3
	Humanities/Social Science	3

Third Semester: (17)

MAC 2313	Multivariable Calculus	3
PHY 2048	Physics I (with Calculus)	5
PHY 2048L	Physics I Lab	1
CHM 2210	Organic Chemistry I	4
CHM 2210L	Organic Chemistry I Lab	1
	Humanities/Social Science	3

Fourth Semester: (17)

MAP 2302	Differential Equations	3
PHY 2049	Physics II (with Calculus)	5
PHY 2049L	Physics II Lab	1
CHM 2211	Organic Chemistry II	4
CHM 2211L	Organic Chemistry II Lab	1
EML 3343	Thermodynamics I	3

Fifth Semester: (16)

CHM 3410	Physical Chemistry I	4
CHM 3410L	Physical Chemistry I Lab	1
ECH 3xx1	Thermo II for Chem Engr	3
EML 3126	Transport Phenomena	3
EML 3126L	Transport Phenomena Lab	1
EEL 3003	Electrical Engineering I	3
EEL 3003L	Electrical Engineering I Lab	1

Sixth Semester: (16 or 15 or 14)

CHM 3411	Physical Chemistry II	5
CHM 3411L	Physical Chemistry II Lab	1
or		
BCH 3033	General Biochemistry	4
BCH 3033L	General Biochemistry Lab	1
or		
BSC 1010	General Biology I	3
BSC 1010L	General Biology I Lab	1
or		
PCB 4733	Human Systemic Phys. I3	
PCB 4733	Human Systemic Phys. I Lab	1
EML 4140	Heat Transfer	3
ECH 3xx2	Chemical Reaction Engr 3	
ECH 3xx3	Dsgn of Staged Separ Proc	3
EML 3301L	Instrument. and Meas. Lab	1

Seventh Semester: (15 or 16 or 17)

ECH 4xx1	Dsgn of Chemical Engr Proc	3
ECH 4xx1L	Chemical Engineering Lab I	2
EML 4312	Automatic Controls	3
ECH 4905	Senior Design Project I	1
EIN 3354	Engineering Economy	3
Technical Elective		3 or 4 or 5

Eighth Semester: (14)

ECH 4xx2L	Chemical Engineering Lab II	2
ECH 4905	Senior Design Project II	3
Humanities/Social Science		9

Table IV-3
Descriptions of Courses Required for Major

Required Lower Division Courses (that are not also required by all engineering programs)

EGN 1100 Introduction to Engineering (1). This course will provide a broad exposure, "birdseye" view of engineering profession to entering freshmen.

or

EML 3006 Concepts of Engineering (1). This course will provide a broad exposure, "birdseye" view of the engineering profession to juniors and seniors.

EGN 1110C Engineering Drawing (3). Laboratory experiences on the principles and practice of idea development and expression through free hand sketching and conventional instrument drafting. A beginning course for students with no prior drafting experience.

CGS 2423 C for Engineers (3). A first course in programming geared for engineering and natural science students that describes the ANSI C programming language.

CHM 2210 Organic Chemistry (4) and CHM 2210L Organic Chemistry Lab I (1). An introduction to chemical bonding and atomic structure theory as it pertains to the chemistry of carbon compounds. Correlation between structure and reactivity of organic molecules followed by a systematic look at the various reaction types using reaction mechanisms as a tool for study. Concurrent registration in both lecture and laboratory is required. Prerequisites: CHM 1046, CHM 1046L.

CHM 2211 Organic Chemistry II (3) and CHM 2211L Organic Chemistry Lab II (1). Continuation of CHM 2210, 2210L. Concurrent registration in lecture and laboratory is required. Prerequisites: CHM 2210, 2210L.

Required Upper Division Courses

Upper Division Courses in Physical Science

CHM 3410 Physical Chemistry I (4) and CHM 3410L Physical Chemistry Lab I (1). Principles of thermodynamics, gas laws, kinetic theory of gases, chemical equilibrium, electrochemistry, and kinetics. Laboratory to be taken concurrently with the course. Prerequisites: MAC 2311, 2312; PHY 2048, 2048L, PHY 2049, PHY 2049L, and CHM 3120, CHM 3120L.

or

CHM 3411 Physical Chemistry II (4) and CHM 3411L Physical Chemistry Lab II (2). C255 Introduction to quantum mechanics. The Schrodinger equation and its application to rotational, vibrational, and electronic spectroscopy, atomic and molecular structure, and bonding. Prerequisites: CHM 3410, 3410L.

or

BCH 3033 General Biochemistry (4) and BCH 3033L Biochemistry Lab (1). Chemistry of proteins, lipids, carbohydrates, and nucleic acids; principles of enzymology, metabolism, and bioenergetics. Prerequisite: CHM 2211 and BSC 1010.

or

BSC 1010 General Biology I (3) and BSC 1010L General Biology Lab (1). Biomolecules, cells, energy flow, genetics, and physiology. Science background or Biology major recommended. Concurrent registration in laboratory is required.

or

PCB 4733 Human Systemic Physiology I (3) and PCB 4733L Human Systemic Physiology Lab (1). Selected topics in human physiology with emphasis on topics of clinical significance. Prerequisite: Introductory human physiology or a college level course in biology or chemistry.

Upper Division Courses in Engineering outside department

EEL 3003 Electrical Engineering I (3). For non-EE majors. Basic principles of DC and AC circuit analysis, electronic devices and amplifiers, digital circuits, and power systems. Prerequisite: MAC 2312. Corequisite: MAP 2302.

and

EEL 3111L Circuits Lab (1). This lab introduces basic test equipment; oscilloscopes, multimeters, power supplies, function generators, etc., and uses this equipment in various experiments on resistors, capacitors, and inductors. Prerequisite: EEL 3049L. Corequisite: EEL 3111.

EIN 3354 Engineering Economy (3). Basic methods of engineering economic analysis including equivalence, value measurement, interest relationships and decision support theory and techniques as applied to capital projects.

Upper Division Courses within the Mechanical Engineering Department

EGN 3343 Thermodynamics I (3). Fundamental concepts of basic thermodynamics including first and second law topics, equations of state and general thermodynamic relationships. Prerequisites: MAP 2312, PHY 2048 and CHM 1045.

EML 3301L Instrumentation and Measurement Laboratory (1). A practical study of common instrumentation elements and measurement systems used in mechanical and electro-mechanical applications. Prerequisites: EEL 3003 and EEL 3111L.

EML 3126 Transport Phenomena (3). Fundamental principles of transport phenomena; Governing Equations; Compressible Flow. Prerequisite: EGN 3321.

EML 3126L Transport Phenomena Laboratory (1). Experiments illustrating the principles of transport phenomena: wind tunnel, shock tubes, airfoils. Corequisite: EML 3126.

EML 4140 Heat Transfer (3). Study of fundamentals of basic heat transfer including conduction, convection, and radiation. Computer applications and design problems emphasized. Prerequisites: CGS 2423, EGN 3343, EML 3126, and MAP 2302.

EML 4312 Automatic Control Theory (3). Feedback control systems; stability analysis; graphical methods. Applications with emphasis on hydraulic, pneumatic electro-mechanical devices and chemical processes. Prerequisites: EGN 3321, MAP 2302 or EGM 3311, CGS 2429 or permission of instructor.

Chemical Engineering Program Courses

ECH 3XX1 Thermodynamics II for Chemical Engineers (3). Maxwell Relations and the prediction of unmeasurable property change in pure substances using the JANAF tables and generalized property charts. Non reacting ideal gas mixtures. Ideal solutions of gaseous, solid and liquid mixtures. Phase equilibrium in ideal solutions. Non-ideal solution data. Chemical equilibria. Energy and entropy changes produced by chemical reactions. Prerequisite: EGN 3343

ECH 3XX2 Chemical Reaction Engineering (3). Study of chemical equilibria, rate of chemical reaction and catalysis. Applications to product specification and equipment design. Prerequisite: ECH 3XX1.

ECH 3XX3 Design of Staged Separation Processes (3). Application of equilibria and mass and energy balances for the design of staged separation processes. Use of various equilibrium laws for the design of distillation, absorption, stripping and extraction systems. Stagewise calculations used in the design of binary systems. Design of multi component separators. Determination of stage efficiency and column size. Prerequisite: ECH 3XX1, Corequisite: EML 3126.

ECH 4XX1 Design and Analysis of Chemical Engineering Processes (3). Use of flowsheet balance calculations, chemical kinetics and thermodynamics, transfer operations, and process economics in designing chemical processing systems. Analysis of design alternatives using case studies and optimization methods. Prerequisites: ECH 3XX2, ECH 3XX3, EML 4140, and EIN 3354.

ECH 3XX1L Chemical Engineering Lab I (2). Experimental study of thermodynamics, fluid mechanics, heat and mass transfer; operation and evaluation of equipment; application of methods of data analysis in practice; use of computers in controlling and simulating experiments; strong emphasis on report writing and oral communication. Prerequisite: ECH 3XX1, EML 4140 and EML 3126.

ECH 3XX2L Chemical Engineering Lab II (2). Quantitative experimental study of chemical and separation processes to include distillation, absorption, extraction, drying

and humidification. Study of reaction equilibrium and reaction rates. Prerequisites: ECH 3XX2 and ECH 3XX3.

ECH 4XX2 Senior Design Project I (1). Project formulation, developing and choosing between alternative solutions. Time and financial planning, project reports written and oral. Selection of projects and organizing project teams. Prerequisites: ECH 3XX2 and 3XX3, co-requisites: ECH 4XX1 and EIN 3354.

ECH 4XX3 Senior Design Project II (3). Completion of team project initiated in Senior Design Project I to complete detail design and construct a working prototype. Written design report and oral presentation required. Prerequisite: ECH 4XX2, ECH 4XX1, EIN 3354.

BOR TABLE ONE

NUMBER OF ANTICIPATED MAJORS FROM POTENTIAL SOURCES

BACCALAUREATE DEGREE PROGRAM

NAME OF PROGRAM: B.S. in Chemical Engineering

CIP CODE: 140701

ACADEMIC YEAR	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5	
	1998	1999	1999	2000	2000	2001	2001	2002	2002	2003

SOURCE OF STUDENTS (Non-Duplicative Count)	HC	FTE	HC	FTE	HC	FTE	HC	FTE	HC	FTE
Upper-level students who are transferring from other major within the university	16	8	12	6	8	4	4	2	2	1
Students who initially entered the university as FTIC students and who are progressing from the lower to the upper level	16	8	25	12.5	34	17	41	20.5	50	25
Florida community college transfers to the upper level II	24	12	36	18	48	24	60	30	68	34
Transfers to the upper level from other Florida colleges/universities	4	2	5	2.5	6	3	7	3.5	8	4
Other (Service Area Industries)	4	2	7	3.5	10	5	13	6.5	16	8
TOTAL	64	32	85	42.5	106	53	125	62.5	144	72

BOR TABLE TWO

FACULTY PARTICIPATION IN PROPOSED DEGREE PROGRAM BY FIFTH YEAR

Faculty Code	Faculty Name or "New Hire"	Academic Discipline/ Specialty	Rank	(For Existing Faculty Only)		Initial Date for Participation in Proposed Program	5th Year Workload In Prop Program (% person year)
				Contract Status	Highest Degree Granted		
A	Ebadian, M.A.	Mechanical Engineering	Prof	Tenured	Ph.D.	Fall 1998	0.10
A	Irey, R.K.	Mechanical Engineering	Prof	Tenured	Ph.D.	Fall 1998	0.10
A	Koylu, U.	Mechanical Engineering	Asst Prof	Tenure Earning	Ph.D.	Fall 1998	0.10
A	Moore, J.E.	Mechanical Engineering	Asst Prof	Tenure Earning	Ph.D	Fall 1998	0.10
A	Munroe, N.	Mechanical Engineering	Asst Prof	Tenure Earning	Ph.D.	Fall 1998	0.10
A	Schoephoerster, R.T.	Mechanical Engineering	Assoc Prof	Tenured	Ph.D.	Fall 1998	0.20
C	New Hire	Chemical Engineering	Assoc/Full			Fall 1998	0.65
C	New Hire	Chemical Engineering	Assoc/Full			Fall 1998	0.65
C	New Hire	Chemical Engineering	Asst Prof			Fall 1999	1.0
C	New Hire	Chemical Engineering	Asst Prof			Fall 1999	1.0
C	New Hire	Chemical Engineering	Asst Prof			Fall 2000	1.0

Faculty Code	Corresponding Faculty Position Category in TABLE 3 for the Fifth Year	Proposed Source of Funding for Faculty	TOTAL 5th Year Workload by Budget Class
A	Current General Revenue	Existing Faculty -- Regular Line	0.70
B	Current General Revenue	New Faculty -- To Be Hired on Existing Vacant Line	---
C	New General Revenue	New Faculty -- To Be Hired on a New Line	4.3
D	Contracts & Grants	Existing Faculty -- Funded on Contracts & Grants	---
E	Contracts & Grants	New Faculty -- To Be Hired on Contracts & Grants	---
		Overall Total for 5th Year	5.0

BOR TABLE THREE

COSTS FOR PROPOSED PROGRAM

	FIRST YEAR				FIFTH YEAR			
	GENERAL REVENUE CURRENT	GENERAL REVENUE NEW	CONTRS/ GRANTS	SUMMARY	GENERAL REVENUE CURRENT	GENERAL REVENUE NEW	CONTRS/ GRANTS	SUMMARY
INSTR & RES								
POSITIONS (FTE)								
FACULTY	0.70	1.30	0.00	2.00	0.70	4.30	0.00	5.00
A&P	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
USPS	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
TOTAL	0.70	2.30	0.00	3.00	0.70	5.30	0.00	6.00
SALARY RATE								
FACULTY	48,027	104,000	0	152,027	48,027	247,250	0	295,277
A&P	0	0	0	0	0	0	0	0
USPS	0	18,000	0	18,000	0	18,000	0	18,000
TOTAL	48,027	122,000	0	170,027	48,027	265,250	0	313,277
I&R								
SALARY/BENEF	59,404	150,515	0	209,919	59,404	328,848	0	388,252
OTH PERS SRVC	0	10,000	0	10,000	0	10,000	0	10,000
EXPENSES	0	30,000	0	30,000	0	30,000	0	30,000
OPERATING CAPITAL OUTLAY	0	150,000	0	150,000	0	10,000	0	10,000
ELECTR DATA PROC	0	0	0	0	0	0	0	0
LIBRARY RESOURCES	0	0	0	0	0	0	0	0
SPECIAL CATEGORIES	0	0	0	0	0	0	0	0
TOTAL I&R	59,404	340,515	0	399,919	59,404	378,848	0	438,252
NON-I&R								
OTHER ACTIVITIES								
LIBRARY STAFFING	0	6803	0	6803	0	15,306	0	15,306
UNIVERSITY SUPPORT	0	26,536	0	26,536	0	60,664	0	60,664
FINANCIAL AID	0	0	0	0	0	0	0	0
STUDENT SRVCS, OTHER	0	17,308	0	17,308	0	38,944	0	38,914
TOTAL OTHER ACTIVITIES	0	50,647	0	50,647	0	114,914	0	114,914
SUMMARY**	59,404	391,162	0	450,566	59,404	493,762	0	553,166

* PERSONNEL

**TOTAL I&R + TOTAL OTHER ACTIVITIES

STATE UNIVERSITY SYSTEM OF FLORIDA
EQUAL OPPORTUNITY IMPACT STATEMENT

Institution:	Name of College/School and Proposed Program:
Florida International University	College of Engineering/B.S. in Chemical Engineering

Note: Please provide responses on a separate sheet.

I. For actions related to academic programs (establishment of new degree programs, modification/expansion or termination of degree programs):

A. Check current level of Board review:
- ☐ Feasibility / Planning
- ☑ Implementation

B. Check type of action proposed:
- ☑ New program
- ☐ Terminated program
- ☐ Modified program

C. What effect will the proposed action have in relation to program duplication? Duplication is focused on Institutions of the opposite race predominance attracting or seeking similar students. (FAMU is predominantly African-American; FIU is predominantly Hispanic; all others are predominantly white). Cite mission statements, enrollment history by county or origin, or other documents; retain documents for possible review.

D. If duplication will result, what rationale (i.e., benefit to the state, outreach to unserved populations, career preparation opportunities within a specific geographic area, etc.) can be provided which substantiates the need for the new program? What is the anticipated impact on existing (duplicative) programs at the SUS institutions in terms of their ability to attract students? List programs, by university, that are utilized for comparison, and indicate the impact, if any, on each of them.

E. If program duplication is documented in items C or D, list the corrective strategies recommended, including the timetable for accomplishment and the responsible administrator.

II. For actions relating to limited access to degree programs, or changes in admissions, continuation, or graduation requirements:

A. State the new policy, rule or requirement.

B. Present the current race and gender profiles of the program or affected level of students. Project the impact of the proposed action on the race and gender profiles. Cite sources used for the projections, and retain documents for possible review.

C. Describe the impact of the proposed action on goals for appropriate employee representation to assure positve impact.

III. For actions relating to restructure of an academic administrative unit, or establishment of a new permanent location for instruction:

A. Describe the current structure and the restructuring plan or location for instruction.

B. Present the current race and gender profiles of the employees within the program or affected unit(s). Project the impact of the proposed action on the race and gender profiles of each level of employment. Cite sources used for the projections, and retain documents for possible review.

C. Describe the impact of the proposed action on goals for appropriate employee representation to assure positive impact.

Prepared by: _____ 9/29/97
(Signature) (Date)
Chair, Mechanical Engineering
(Title)

Approved by: _____ 9/30/97
(University EO Officer) (Date)

_____ 9/30/97
(Vice President for Academic Affairs) (Date)

_____
(Associate Vice Chancellor and Director
BOR Office for Equal Opportunity Programs)

_____
(Date)

APPENDIX IB
EO IMPACT STUDY
SUMMARY AND ENDORSEMENT FORM

Date: 2-15-95 **University:** Florida International University

College/School: Engineering & Design **Department:** Mechanical Engineering

Name and Level of Degree Program to which this EO Impact Study Applies:
B.S. in Chemical Engineering

Program Action (Please check):

- XX Conducting feasibility studies/planning for a new degree program.
- ____ Implementation of a new program.
- ____ Modification and/or expansion of a degree program.
- ____ Limiting student access to part or all of a degree program.
- ____ Restructuring an academic administrative unit.
- ____ Termination of a degree program.
- ____ Establishment of a new, permanent location for instruction.
- ____ Changing BOR rules concerning admissions, continuation or graduation requirements.

Summary of EO Impact Study:
Florida International University has conducted feasibility studies and planning for the B.S. degree in Chemical Engineering. The new program will be housed within the existing Department of Mechanical Engineering at the College of Engineering and Design. It is expected that this new program will greatly increase the numbers of B.S. degrees awarded to minority and female students in Chemical Engineering for the state of Florida. It is anticipated that over 50% of the total number of students enrolled in the new program wil consist of individuals from traditionally underrepresented groups or females.

PREPARED BY:

Department Head — Date 2/15/95

Dean — Date 2/15/95

Provost/VP Academic Affairs — Date 4/7/95

University EO Director — Date 3/7/95

University President — Date 4/7/95

APPROVED BY:

Director, Board of Regents, Office for Equal Opportunity Programs — Date

[illegible]/IMPACT.SUM-12/14/93

EO IMPACT STUDY

FOR CONDUCTING FEASIBILITY STUDY AND PLANNING FOR A NEW DEGREE PROGRAM

1. Will the proposed program affect program duplication between this university and other State University System (SUS) universities which attract or seek similar students? Explain fully.

Other SUS universities which offer a B.S. in Chemical Engineering are the University of Florida, Florida A&M/Florida State University (joint College of Engineering), and the University of South Florida. A comparison of the student population among the Colleges of Engineering at each of these universities may be represented by degrees issued in 93-94 academic year, as follows:

	UF	FAMU/FSU	USF	FIU
All B.S. in Engineering, Total	611	220	314	219
All B.S. in Engineering, Blacks	21	62	11	16
All B.S. in Engineering, Hispanics	61	9	31	115
All B.S. in Engineering, Women	101	55	50	36
B.S. in Chem. Engg., Total	42	26	23	0
B.S. in Chem. Engg., Blacks	1	7	4	0
B.S. in Chem. Engg., Hispanics	6	1	4	0
B.S. in Chem. Engg., Women	11	14	7	0

Results of a survey of prospective students (see section III-B.3 in the Feasibility Report) indicate that, out of a total of 68 students noting interest in a Chemical Engineering program at FIU, 8 listed themselves as Black, 40 as Hispanic, and 22 as Female. These data clearly exhibit the uniqueness of the prospective student population in Chemical Engineering compared with the other SUS universities offering this program. A majority of prospective students will be from minority groups, and a third may be female. Students from minority group families as well as those who are female are typically place-bound by job, home, traditions, and therefore are unlikely to relocate to another city for their educational advancement. The traveling required to attend regular classes in Tampa (USF is the closest SUS program) is considerable and many students are discouraged to even start when their jobs and families are located so far away from their place of study. Therefore, we feel confident that there will be minimum duplication in terms of attracting or seeking similar students as other SUS universities.

2. What would the effect of placing the proposed program at an SUS with a different racial/ethnic group predominating? Explain fully.

As stated above, FIU and, in particular, the College of Engineering, has a unique student population in comparison with other SUS institutions. The following table contains

information from SUS universities which do not currently offer a B.S. in Chemical Engineering:

	FAU	UCF	UWF	FIU
All B.S. in Engineering, Total	185	298	7	219
All B.S. in Engineering, Blacks	22	7	0	16
All B.S. in Engineering, Hispanics	22	23	0	115
All B.S. in Engineering, Women	33	51	2	36

This data along with the table presented under question #1 indicate that FIU conferred more B.S. degrees in engineering to minority students than any other SUS university, and a similar percentage to female students as other SUS institutions. Furthermore, these minority and female students are typically place-bound by culture and economic constraints, as mentioned previously. Placement of this new program in another SUS institution would greatly hinder the ability of these students to advance their education.

We feel FIU has a tremendous potential to achieve national recognition in educating minorities and women in engineering, who are so scarce nationwide. Southeast Florida is one of the most heavily populated areas in Florida, and has one of the largest populations of Hispanics in the nation, especially in Dade County. We have a significant portion of underrepresented minority groups enrolled at FIU and in the College of Engineering, and our survey of prospective students indicate that this trend will continue in the new program.