

1985

University of Central Florida 1985 Self Study Southern Association of Colleges and Schools: Department of Industrial Engineering and Management Systems Self Study

University of Central Florida. Department of Industrial Engineering and Management Systems

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UNIVERSITY OF CENTRAL FLORIDA

1985
Self Study

SOUTHERN ASSOCIATION OF COLLEGES AND SCHOOLS

DEPARTMENT OF INDUSTRIAL ENGINEERING AND
MANAGEMENT SYSTEMS

SELF STUDY REPORT

DEPARTMENT OF INDUSTRIAL ENGINEERING & MANAGEMENT SYSTEMS

Self Study Departmental Report

1. Philosophy

1.1 Role in the University and the Community

The IEMS department has two options: Industrial Engineering (IE) and Engineering Mathematics and Computer Systems (EMCS).

The option in Industrial Engineering is concerned primarily with the design, improvement and installation of integrated systems of man, materials and equipment for operations through the application of the principles of the engineering, mathematical, physical, and behavioral sciences.

The program of study available within this option enables the student to pursue an integrated series or sequence of courses in the major field which includes not only basic and fundamental courses but specialized courses as well, in the areas of management standards development, manufacturing production and inventory control, project management, work analysis and design, management information systems, computer simulation, operations research, industrial facilities planning and design, and human engineering. These specialized courses reflect the contemporary developments and trends in each of these areas with emphasis on uses of the digital computer in appropriate courses.

In contemporary professional engineering practice and in research and development activities, there is an increasing need for engineers with a high degree of training and capability in the application of mathematics and computers to the modeling, simulation and solution of complex technical problems. Many modern industries and government organizations are involved in the design and analysis of highly complex equipment and systems often requiring rigorous mathematical treatment which can only be carried out effectively through the use of modern, high speed, digital/analog/hybrid computer facilities. The computer has become an indispensable partner to the aerospace systems designer, the microelectronic circuit designer, the environmental systems analyst, the industrial manager and many other professional engineering oriented activities. Thus, students majoring in Engineering Mathematics and Computer Systems will enjoy a broad spectrum of challenging opportunities.

Faculty and students are very active in professional societies. Faculty regularly participate in conferences, workshops and seminars both at local, regional, national and international levels.

1.2 Evaluation and Projections

The College of Engineering at the University of Central Florida was formally organized by the Engineering faculty in the Fall of 1974. The objective of the Professional College of Engineering is to produce well qualified, competent graduates from outstanding accredited programs for the practice of engineering and to conduct research and service responsive to the State of Florida and national needs. To achieve high professional status, the Professional College of Engineering has developed a unique and outstanding educational program to serve the people of Florida by providing engineering education in specifically selected professional disciplines.

There is a growing tendency on the part of industry, government and institutions to select engineering personnel for managerial positions. Because of this the IEEMS courses are oriented to systems management principles and concepts so as to enable the Industrial Engineering graduate to accept and succeed in these opportunities.

The University has recently instituted a Ph.D. program in IE and new options in the Master's program, such as Simulation and Computer Integrated Manufacturing. These and new programs like them are needed to help Central Florida attain the status of high technology region it is trying to achieve.

2. Organization

2.1 Duties and Staffing

The Department has a Chairman and an unofficial assistant. There is one faculty member designated as a contact person for Ph.D. candidates. Each faculty member is assigned a proportionate share of the enrolled students for advising. There are no other formal administrative assignments.

This organization has served the Department well and no suggestions for improvement are posed.

Current staffing is deficient. There is one faculty member on a two year leave of absence and one on 100% released time for a year. Three faculty members are designated to become part of the new Computer Engineering Department. Presently, one adjunct and three graduate students are being utilized to help carry the course load. There is one full-time permanent secretary, one full-time temporary, and a variable number of student assistants and work study student assistants. This staffing is also currently deficient. The Dean's office is responsible for administering the technical personnel. In order to meet current and future demand it is suggested that a minimum of three new tenure-earning track faculty members and one full-time secretary be hired and OPS funding to support another 20 - 30 hours per week of student assistance in the office should be planned.

There is currently not enough funding available for sufficient graduate assistance support. It is suggested that each faculty member be assigned ten hours per week of graduate assistance. For each 40 students enrolled additional increments of 10 hour increments per week should be assigned. There currently are enough students to meet this requirement. Presently wage rates are fair and proper.

2.2 Support and Communications

The college support structure facilitates operations of this department in many ways. The library reserve system helps supplement course content. The many offices in Administration ease the non-academic burden of the faculty's responsibilities hence freeing time for academic and research activities. No improvements are suggested.

Departmental communications with students and other offices of the university is open and active. No changes are suggested.

2.3 Projections

There is currently no formal planning procedure for the Department. Since all policy changes are controlled by the Dean's Office, no suggestions are made. Informally, programs in Manufacturing Engineering and Human Engineering are being developed and progress is being made.

The advent of the Computer Engineering Department qualifies as an anticipated organizational change and since this Department will be releasing a large amount of equipment to the new department, it is suggested that this Department be given a special OCO allotment for appropriate replenishments.

3. Educational Program

3.1 Correlation of Program and Objectives

The following is a statement of current program objectives:

1. The Industrial Engineering option is concerned principally with the design, improvement, and installation of integrated systems of men, materials, and equipment for operations through the applications of the principles of the engineering, mathematical, and behavioral sciences.

2. The EMCS option is designed to provide the basic engineering education for those who desire to enter areas of contemporary professional engineering practice, or research and development activities where there is an increasing need for engineers with a high degree of training and capability in the application of mathematics and computers to the modeling, simulation and solution of complex technical problems.

3. To build a sound learning environment with emphasis on creative thinking and current and advanced knowledge, using modern instructional and research tools.

4. In this development, to emphasize the interaction of man and machine in the modern industrial environment and to produce well-rounded, broadly educated basic level graduates with a firm grasp of fundamental principles, appreciation of and vision to foresee problems, and ability to attack them in a logical fashion, whether individually or in a team approach.

5. To produce graduates desirous of and capable of pursuing higher education and life-long education. To implement and prosecute a graduate program to accomplish higher education which will at the same time serve to advance the frontiers of knowledge. To continually improve the faculty and through spin-off provide the most up-to-date technical information in the teaching-learning process.

A description of the course requirements in each option and how each course contributes to attain these objectives is provided in the attached tables.

TV sessions are offered at the three centers (Brevard, Daytona and South Orlando) in several of the departmental courses.

BASIC LEVEL PROGRAM - COURSE REQUIREMENTS
 University of Central Florida, Industrial Engineering

Semester or Quarter	Course (Dept. & No.)	Category (Credit Hours)					
		Math	Basic Sci	Engr Sci	Engr Design	Hum & Soc Sci	Other
1	ENC 1103 Composition S.S. Elective					3/4	4
	EGN 1380 Chem. Fund. Engr.		3				
	MAC 2154 Anal. Geom.	3					
	EGN 1111 Engr. Graphics				3		

2	SPC 1014 Fund. Oral Comm.						3
	EGN 1381 Chem. Fund. Engr.		3				
	MAC 3311 Calculus I	4					
	EGN 1510 Creative Design				3		
	ECO 2023 Economics					3/4	

3	COP 3215 Prog. & Num. Methods				3		
	MAC 3312 Calculus II	4					
	EGN 2382 Engr. Concepts		4				
	HUM 2000 Western Humanities						4

4	BIOL/Earth Science Elective		4				
	MAC 3313 Calculus III	4					
	EGN 3311 Statistics			4			
	EGN 3704 Engr. & Environment			3			

5	MAC 3314 Intermed. Calculus	4					
	EGN 3321 Dynamics			4			
	EGN 3383 Elec. Science		4				
	HUM Elective						4

6	MAP 3302 Differential Equations	4					
	EGN 3343 Thermodynamics			4			
	EGN 3373 Prin. Elec. Engr.		2	2			
	HIST. Elective						4

7	EGN 3331 Mech. of Materials			5			
	EGN 3353 Fluid Mechanics			4			
	EGN 3375 Elec. Devices Sys.			4			
	EGN 3703 Systems Analysis			4			

BASIC LEVEL PROGRAM - COURSE REQUIREMENTS (Continued)
 University of Central Florida, Industrial Engineering

Semester or Quarter	Course (Dept. & No.)	Category (Credit Hours)					Other
		Math	Basic Sci	Engr Sci	Engr Design	Hum & Soc Sci	
8	STA 3032 Prob. & Stat.	3					
	PHY 3421 Optics & Wave Motion		3				
	EGN 3363 Str. & Prop. Matl.			4			
	S.S. Elec					4	
	EIN 4332 Production Invent.			1	2		

9	ENC 3355 Prof. Report Writing						3
	EGN 4624 Engr. Admin.						3
	EGN 4634 Oper. Research			3			
	EIN 3315 Mgmt. Standards				4		
	Tech. Elec. (*)						2

10	Health Rel. Prog. Elec.						3
	EGN 3613 Engr. Econ.				3		
	ACC 3812 Acct. Engr.						4
	ESI 4314 Oper. Res.			3			
	Tech ELEC. (*)						3

11	Hum Elec.					3	
	PHY 3101 Mod. Physics		3				
	EIN 4116 Ind. Info. Sys.			1	2		
	ESI 4234 Engr. Rel. Q.A.			2	1		
	Tech. Elec. (*)						4

12	Bus. Admin. Elec.						3
	S.S. Elec.					3	
	EIN 4243 Human Engr.			1	2		
	EIN 4364 Ind. Fac. Plan.				4		
	Tech. Elec. (*)						3

(*) Tech. Elec. include additional Engr. Sci. and Design...							
TOTALS		26	26	49	29	29	35

BASIC LEVEL PROGRAM - COURSE REQUIREMENTS
 University of Central Florida, Engineering Math and Computer Systems

Semester or Quarter	Course (Dept. & No.)	Category (Credit Hours)					
		Math	Basic Sci	Engr Sci	Engr Design	Hum & Soc Sci	Other
	ENC 1103 Composition S.S. Elective					3/4	4
	EGN 1380 Chem. Fund. Engr.		3				
	MAC 2154 Anal. Geom.	3					
	EGN 1111 Engr. Graphics					3	

	SPC 1014 Fund. Oral Comm.						3
	EGN 1381 Chem. Fund. Engr.		3				
	MAC 3311 Calculus I	4					
	EGN 1510 Creative Design				3		
	ECO 2023 Economics					3/4	

	COP 3215 Prog. & Num. Methods				3		
	MAC 3312 Calculus II	4					
	EGN 2382 Engr. Concepts		4				
	HUM 2000 Western Humanities						4

	BIOL/Earth Science Elective		4				
	MAC 3313 Calculus III	4					
	EGN 3311 Statistics			4			
	EGN 3704 Engr. & Environment			3			

	MAC 3314 Intermed. Calculus	4					
	EGN 3321 Dynamics			4			
	EGN 3383 Elec. Science		4				
	HUM Elective						4

	MAP 3302 Differential Equations	4					
	EGN 3343 Thermodynamics			4			
	EGN 3373 Prin. Elec. Engr.		2	2			
	HIST. Elective						4

	EGN 3331 Mech. of Materials			5			
	EGN 3353 Fluid Mechanics			4			
	EGN 3375 Elec. Devices Sys.			4			
	EGN 3703 Systems Analysis			4			

BASIC LEVEL PROGRAM - COURSE REQUIREMENTS (Continued)
University of Central Florida, Engineering Math and Computer Systems

Semester or Quarter	Course (Dept. & No.)	Category (Credit Hours)					Other
		Math	Basic Sci	Engr Sci	Engr Design	Hum & Soc Sci	
8	STA 3032	3					
	PHY 3421		3				
	ENG 3363			4			
	S.S. Elec					4	
	ESI 4503			3			

9	ENC 3355						3
	EGN 4624						3
	EGN 4634			3			
	EGN 4714				4		
	Tech. Elec. (*)						2

10	Health Rel. Prog. Elec.						3
	EGN 3613				3		
	ECM 4124			3			
	EEL 4342				4		
	Tech. Elec. (*)						3

11	Hum. Elec.					3	
	PHY 3101		3				
	ECM 4504				4		
	Tech Elec. (*)						6

12	Bus. Admin. Elec.						3
	S.S. Elec.					3	
	ESI 4144			2	2		
	ECM 4814				4		
	Tech. Elec. (*)						2

TOTALS -		26	26	49	30	29	32

(*) Tech. Elec. include additional Engineering Science and Design...

3.2 Admissions

The Department follows the University and College of Engineering policies in admissions, "honors" programs or programs for students admitted on academic probation or warning. There are no specific data available to determine if community college transfers fit into the Department's programs in a way significantly different from native students.

3.3 Enrollment

Number of Majors, Minors and Degrees Awarded

Year	Fall 78	Fall 79	Fall 80	Fall 81	Fall 82
EMCS	104	119	144	198	270
B.S. Degrees Awarded	14	11	13	10	21
IE	61	71	87	76	80
B.S. Degrees Awarded	17	8	17	13	14

The department does not grant "minors".

Recruiting: The department makes an effort to reach and recruit students from area high schools and junior colleges. Talks by the chairman and faculty are periodically scheduled. Also, through Mrs. Lucy Morse, the department has launched a program to recruit women and minority students, which is currently sponsored by the College of Engineering.

Courses offered to fewer than 10 students: The University's guidelines accept cancellation of courses with fewer than 12 (undergraduate) or 7 (graduate) students. Accordingly, many graduate and occasionally a few undergraduate courses are given to fewer than 10 students. Frequently an Independent Study course is offered to a graduate student on a one-to-one basis when special topics are needed for a research report or thesis.

3.4 Curriculum

Area of Concentration:

i. Industrial Engineering Faculty: Bauer, Biegel, Brooks, Doering, Hosni, Klee, Linton, Schrader, Sepulveda, Smith, White

ii. Engineering Math and Computer Systems Faculty: Bauer, Brooks, Klee, Linton.

In both areas there are enough qualified faculty. All courses given fit into the departmental philosophy outlined above. Change, additions or deletions of core courses are decided by the correspondent College of Engineering Committee. Option courses are discussed by a departmental committee.

COURSES SCHEDULED

	78-79	79-80	80-81	81-82	82-83
Lower Division	16	17	8	18	6
Upper Division	32	54	70	62	62
Graduate	63	57	75	56	57

No courses are offered in other departments that should be taught by the Industrial Engineering and Management Systems Department. Several interdisciplinary courses are taught by the Industrial Engineering and Management Systems Department within the core philosophy of the College of Engineering courses. They include Engineering Administration, Operations Research, Engineering Economy, and Probability and Statistics. There are no courses offered primarily to satisfy the general education program. Prerequisites by course are decided by the instructor and reviewed by a departmental committee. No experimental courses are offered. The undergraduate programs include 8 hours of restrictive electives ('83-'84 catalog) and no free electives, among the 132 hours required. The number of credit hours assigned to a course depends primarily on the number of direct contacts and the number of laboratory hours per week. Evidence for the effectiveness of the current programs can be found in the fact that our graduates are actively sought by industry. As described earlier, the programs offered by the Industrial Engineering and Management Systems Department are in the forefront of current technology and are such that they must be continually monitored and adapted to respond to technological challenges and changes.

3.5 Instruction

Each course has a syllabus describing course objectives, texts, grading practices, course outline, etc. Usually one to three courses per term have been taught by adjuncts. None on a regular basis. The number depends on the research grants (and release time) earned by faculty members. Instruction effectiveness is evaluated by students each term, according to UCF policies.

GRADE SUMMARIES BY YEAR AND LEVEL

Course Description	Course Level	A	B	C	D	F	W	S	I	Total
78 Eng. Core	(LD)	14.9	34.1	26.2	8.0	8.8	7.8	—	0.2	565
IE	(UD)	33.0	34.9	23.9	2.7	0.9	—	—	1.2	168
Eng. Core	(UD)	17.4	32.7	28.5	7.9	5.9	6.2	—	1.4	1,657
IE	(G)	21.6	40.6	2.7	—	—	8.1	10.8	16.2	37
79 Eng. Core	(LD)	10.3	26.2	25.4	10.2	6.6	9.1	—	12.2	649
IE	(UD)	21.5	36.6	19.3	11.8	4.3	6.5	—	—	93
Eng. Core	(UD)	18.7	31.0	27.3	7.7	4.8	9.5	—	1.0	1,626
IE	(G)	51.9	15.1	4.7	—	—	6.6	4.7	16.0	106
80 Eng. Core	(LD)	15.9	31.2	31.2	10.3	4.5	6.7	—	0.2	776
IE	(UD)	26.9	32.8	21.8	7.6	4.2	6.7	—	—	119
Eng. Core	(UD)	20.7	33.4	21.2	8.5	4.7	9.4	—	2.1	1,808
IE	(G)	45.0	20.8	8.3	0.8	4.2	8.3	6.7	5.9	120
81 Eng. Core	(LD)	13.4	30.9	27.9	10.9	5.7	10.5	—	0.7	560
IE	(UD)	23.9	32.8	14.2	6.7	3.0	17.9	—	1.5	134
Eng. Core	(UD)	16.7	26.8	27.9	5.8	4.7	17.0	—	1.1	2,377
IE	(G)	35.3	27.3	10.1	1.0	—	7.1	9.1	10.1	99
82 Eng. Core	(LD)	7.5	25.6	32.6	10.5	6.1	17.5	—	0.2	703
IE	(UD)	16.1	39.3	26.8	7.1	4.2	4.7	—	1.8	168
Eng. Core	(UD)	14.4	26.9	28.2	8.1	6.5	14.7	—	1.2	2,546
IE	(G)	34.3	32.4	4.6	—	1.0	14.8	8.3	4.6	108

Note 1: LD = Lower Division
 UD = Upper Division
 G = Graduate

Note 2: IE stands for both IE and EMCS courses. Engineering Core summaries are also given, since the department offers several of these courses.

3.6 Other Activities

A copy of the most recent (1982 - 1983) Annual Report is included. As can be readily observed, the Department is quite active in professional and community activities.

3.7 Projections

It is anticipated that, because of a College of Engineering determination the Department will be reduced to the Industrial Engineering Option. The Engineering Mathematics and Computer Systems option will, with the Digital Systems option of the Electrical Engineering Department, form the basis of a new College of Engineering Department, the Computer Engineering Department.

In Industrial Engineering it is foreseen that the Department will continue to emphasize high technology development, such as CAD/CAM (Computer Aided Design/Computer Aided Manufacturing) capabilities, manufacturing processes, robotics and digital computer simulation.

4. Financial Resources

4.1 Outside Funding

Other than Sponsored Research, there are no outside financial support activities in this Department.

4.2 Auxiliary Activities

There are none.

4.3 Budgets

Not applicable

4.4 Equipment

OCO funds are expended according to each faculty member requesting items pertinent to their teaching activities, subject to the Chairman's and the Dean's approval in turn. This system works well and all items so procured are well utilized.

5. Faculty

5.1 Recruitment and Selection

New faculty members are recruited by advertisement and by letter to other university departments. Selection is by the Dean as recommended by the Chairman. In addition, recruitment is occasionally accomplished through personal contact between faculty and prospective faculty members.

Non-academic credentials are of minor significance.

There are no part-time faculty members.

5.2 Organization, Preparation and Growth

There are no official sub-organizations in this Department.

Research and professional activity play major roles in faculty evaluation.

Babu, A.J.B. (Visiting Assistant Professor) (1983)

Ph.D. (S. Methodist U., 1979)

Computers, Operations Research, Simulation.

ORSA, TIMS, IIE

Bauer, C.S. (Professor and Acting Chairman) (1970)

Ph.D. (U. Florida, 1975), P.E. (Florida, 1972)

Traffic Systems, Computer Applications, Simulation.

Acting Director, Institute for Simulation and Training.

ORSA, TIMS, IIE, AAAS, IEEE, FES

Biegel, J.E. (Professor) (1982)

Ph.D. (Syracuse U., 1972), P.E. (New Mexico)

Manufacturing, Automation, Robotics, CAM.

IIE, SME, RI, NCS, CSA

Brooks, G.H. (Professor) (1982)

Ph.D. (Georgia Inst. of Tech., 1965), P.E. (Alabama, 1966)

Information-Decision Systems, Microcomputer Applications.

IIE, ECPD

Doering, R.D. (Professor) (1969)

Ph.D. (U. of S. Calif., 1968), P.E. (Florida, California)

Management, Energy Conservation, Economic Decision Making.

IIE, APM, FES, SAFSR, AMA

Hosni, Y.A. (Associate Professor) (1976)

Ph.D. (U. of Ark., 1976), P.E. (Florida)

Applied Operations Research, Systems Analysis, Production Plant Design.

IIE, IEEE, NSPE, ASEE

- Klee, H.L. (Assoc. Prof.) (1972)
Ph.D. (Polytech. Inst. of Brooklyn, 1972), P.E. (Florida)
Systems and Control Simulation of Solar Energy Systems.
IIE, AS-ISES, FSC
- Linton, D.G. (Associate Professor) (1977)
Ph.D. (U. of Florida, 1972), P.E. (Florida)
System Simulation, Numerical Analysis
ASEE, ORSA, TIMS, IEEE, IIE
- Morse, L. (Instructor) (1982)
M.S. (U.C.F., 1982)
Minority Affairs Delegate, Dean's Office.
IIE
- Schrader, G.F. (Associate Dean and Professor) (1969)
Ph.D. (U. of Illinois, 1960), P.E. (Illinois, Florida)
Productivity, Manufacturing, Administration.
NSPE, FES, ASEE, ASQL, IIE
- Sepulveda, J.A. (Associate Professor) (1981)
Ph.D. (U. of Pittsburgh, 1981), P.E. (Chile, Florida)
Simulation Forecasting, Health Operations Research.
IIE, TIMS, ORSA, APHA, SES
- Smith, L.L. (Assistant Professor) (1982)
Ph.D. (U. of Texas at Arlington, 1982)
Human Factors, Artificial Intelligence, Visual Information
Processing.
IIE, HFS, SXRS, AAAS
- White, C.J. (Assistant Professor) (1977)
M.S.E. (U.C.F., 1979), P.E. (Florida, 1975)
Quality Control, Facilities Layout, Safety Engineering
IIE, ASEE
- Whitehouse, G.E. (Professor) (1978)
Ph.D. (Ariz. St. U., 1966), P.E. (Pennsylvania, 1966; Florida, 1979)
Applied Operations Research, Simulation, Network Models, Micro
Computer Applications.
ORSA, TIMS, ASEE, FES, PMI, IIE

5.3 Salaries

Faculty salaries are determined by the Dean in conjunction with the step system established through collective bargaining. Salaries are in the third quartile nationally. Salary increases are awarded according to guidelines set each year by the Florida Legislature.

5.4 Teaching Loads

Teaching loads are assigned by the Chairman. Full load constitutes 3 courses plus administrative service/student advisement. Research is budgeted in 25% increments each increment substituting for one course. In the Fall and Spring Semesters a maximum of 50% research is imposed by the Dean. Full time research activity is allowed in the Summer Terms. Loads are unaffected by enrollment.

5.5 Evaluation, Security and Promotion

Generally only tenured faculty members are promoted. New faculty members must apply for tenure on or before their sixth year. If tenure is earned, promotion from Assistant to Associate Professor is perfunctory. Faculty members with tenure from other institutions must earn tenure in two years. Faculty are evaluated on the basis of their performance in teaching, in service, in research and in publications. For promotion from Assistant to Associate Professor, satisfactory performance in three of these four areas is required. For promotion from Associate to full Professor, balanced performance in all four areas is required.

5.6 Working Conditions

Office space is grossly inadequate. Classrooms are generally adequate. Laboratory space is grossly inadequate. A new building is underway which when completed will mollify these inadequacies. Equipment is generally adequately available. Supplies through OPS are limited. Course schedules are determined outside the department. Special requests made 2 - 3 semesters in advance are generally granted.

5.7 Projections

See comments on new building in Section 5.6. The Dean's Office is responsible for support personnel projections.

6. Library

6.1 Collections

Library holdings are currently adequate. Emphasis on enhancing the holdings in Human Factors and Manufacturing Engineering has been made.

6.2 Coordination

Adequate.

6.3 Services and Facilities

Adequate.

7. Student Development Services

7.1 Student Mix (Fall 1983)

	<u>White</u>		<u>Black</u>		<u>Hispanic</u>		<u>Other</u>		<u>Inter- national</u>	
	<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>
Lower Division	7	2	0	0	0	1	0	0	1	0
Upper Division	32	18	1	1	3	2	0	0	11	2
Graduate	21	14	1	0	0	0	0	0	7	0

7.2 Advising

Departmental students are encouraged to seek advice from faculty. The University also has special counselors through the Office of Undergraduate Studies and there exists an Office of Academic Peer Advisement (Office of Student Affairs). Faculty are required to post office hours for regular advising. Finally, if a student chooses to do so, he may self-advise. There is no data available to the extent students utilize each service.

7.3 Organization

The Department sponsors Alpha Pi Mu and Tau Beta Pi, student honor societies. It also encourages participation in organizations such as the Institute of Industrial Engineers and the Society for Computer Simulation. There are no membership restrictions and no special funding is provided.

7.4 Discipline and Records

Alleged violations of university rules of conduct are handled through appropriate channels as determined by the Dean of Students.

7.5 Financial Aid and Alumni

The Department strives to provide scholarships to merit students through part time employment in grants and research projects. Students are also encouraged to do part-time work in cooperative arrangements with local industry. No special effort is made to keep abreast of what and how graduates do after graduation.

8. Physical Facilities

8.1 Facilities

A new building for the College of Engineering is under construction and due to become available in the summer of 1985. It is foreseen that this facility will adequately meet the current and future (up to 10 years) needs for classrooms, laboratories, office and clerical space, research areas and special purpose facilities.

8.2 Provisions

Departmental Faculty participated extensively in the planning and initial design of the new facilities. Adequate provisions are included for parking, loading, handicapped access, and safety.

9. Special Activities

9.1 Type of Special Activities

The Department sponsors an annual International Conference on Computers and Industrial Engineering. Through the Office of Extended Studies several faculty members periodically offer seminars, short-courses and workshops on topics such as microcomputers, robotics, computer programming and the like.

Departmental Faculty are very active in professional journals both as contributors and as editors.

9.2 Organization and Funding

There is no special organizational structure for funding allocated for the activities outlined above.

9.3 Academics

Faculty for seminars, short-courses and workshops are the same faculty on regular departmental duties. Some of the seminars offered grant continued education credits to participants.

10. Graduate Programs

10.1 History and Need

In order to meet community needs a Master of Science (M.S.) program was introduced in 1974. Similarly, a Ph.D. program was approved and began in 1983. These programs allow for research contracts otherwise not available and also enable this Department to be competitive with like departments in the State University System. Success is measured by the percentage of enrolled graduate students who actually graduate.

10.2 Faculty

Graduate faculty is identical to the staff described in Section 5.

10.3 Students

Graduate students are selected by the Dean's office either with or without the Chairman's approval or recommendation. Each applicant must have an accredited undergraduate degree in an Engineering Science and have scored over 1000 combined verbal and quantitative on the Graduate Record Exam for unconditional admission. Applicants without these qualifications are reviewed on an individual basis. Applicants without undergraduate Engineering Science degrees but with some other accredited degree may be provisionally admitted with the provision of satisfactorily completing certain deficiency (undergraduate) courses (Calculus I, II, III, and differential equations, as a minimum).

Students are assigned to faculty members as graduate assistants by the Chairman. If a faculty member has funding for graduate assistants by Sponsored Research, he/she has complete discretion as to who to employ. Employment generally is on a quarter time basis.

Each student is responsible for developing his/her graduate program. Each student may confer with an assigned advisor. Each student selects his/her own graduate committee subject to the restrictions outlined in the appropriate University Catalog.

10.4 Instruction

There are no special instructional techniques used in the graduate program. Several graduate courses are offered by video tape (please refer to Section 15).

10.5 Library

There are no specific special library sources which support the graduate program. There is anticipated a need for bolstering the depth of current titles and publications in the areas of Manufacturing Engineering and Human Factors as discussed in Section 6.

10.6 Financial Resources

The graduate program is funded through OPS funds distributed at the discretion of the Chairman. Currently the availability of funds is inadequate and only by securing appropriately budgeted Sponsored Research funds is it possible to support additional students.

10.7 Graduate Enrollment

Graduate Enrollment and Degrees Awarded

	<u>78-79</u>	<u>79-80</u>	<u>80-81</u>	<u>81-82</u>	<u>82-83</u>
Enrollment EMCS	16	22	43	43	62
Enrollment IE	16	32	25	22	42
M.S. Degrees EMCS	4	2	-	2	-
M.S. Degrees IE	1	5	6	2	1

No Ph.D. degrees have been awarded to this date. In 1982 - 1983 there were 5 students accepted in the Ph.D. program.

11. Research

11.1 Administration

The Chairman encourages the faculty to obtain sponsored research in order to secure funds for graduate student support (see Section 10.3). The Dean considers sponsored research as an important factor in determining annual salary increases. Further, summer employment opportunities are awarded according to the degree of sponsored research earned by each faculty member.

Release time, space, equipment, funding for administrative staff, expenses, and travel are all budgeted in each research proposal. When bargaining is involved and the requested budget is reduced, usually equipment, administrative staff and expenses are absorbed by the department.

There are no formal procedures for evaluating research conducted by faculty members. Rewards are indirect in the form of salary increases (as described above) and if such results in publications. There will be an indirect positive influence on promotion and tenure considerations.

Presently, the Chairman plays a minor administrative role in the research area.

11.2 Funding

There are limited opportunities for internally sponsored research. This program is administered by the Dean's office and when approved, funds release time only. All other expenses are department supported.

Funding for externally sponsored research is as appropriate to the specific source. Currently the university charges 39% overhead on all requested expenses except capital expenditures on equipment. This overhead rate is variable from year-to-year and is outside the control of the Engineering College.

11.3 Space

(1) Space for exclusive faculty research.....	0
(2) Shared faculty and student research.....	0
(3) Shared faculty research and teaching.....	1500 sq ft.

Projected for 5 years is the addition of the new building. Exact room assignments have not yet been made, but the space for (1) and (2) above will be reasonable.

Projected for 10 years, increases in all three areas will be necessary.

11.4 Future Development

Each faculty member will continue to share his full time equivalent between teaching and research. It will not be allowed for any faculty member to be a full-time researcher. Full-time teaching loads occur only when sponsored research is not currently approved or funded. Obtainment of sponsored research is not required but is certainly highly encouraged and indirectly (as discussed in Section 11.1) rewarded.

12. Summer Terms

12.1 Courses

Core courses are always offered in the Summer term. In the option no required courses are offered. If faculty time is available, approved elective courses are usually offered. No improvement is warranted.

12.2 Faculty

Selection is as described in Section 11.1.

12.3 Funding

Research funding is as a faculty member has had budgeted. Teaching funding is administered by the Dean.

12.4 Schedule

The Summer Schedule is determined by the Dean's office commensurate with departmental requests. Workshops and institutes are administered by the College of Extended Studies.

12.5 Students

The student mix is virtually the same as during regular semesters. Summer enrollment is not required.

13. Computers

13.1 Impact and Needs

Due to the nature of its educational objectives, computers and computer applications are at the heart of the Department's activities. The University's computer center hardware and software are extensively utilized in courses and research. The College of Engineering has its own minicomputer and each faculty office has a microcomputer which can act as stand alone or as a remote terminal to the College of Engineering VAX Minicomputer or the University's IBM 4341 Computer.

In addition, the Department has a number of microcomputers of different manufacture which are extensively used in research activities. In fact, the Department has currently a position of national prominence for its use of microcomputers in engineering and education. It is expected that in the next 10 years the Department will continue to emphasize the use of computers, especially in the fields of Computer Aided Design and Computer Aided Manufacturing.

14. The Brevard, Daytona and South Orlando Centers

14.1 Courses

Courses taught at these centers are determined and scheduled by the Dean's office.

14.2 Faculty

Courses are assigned on initially a volunteer basis. If vacancies remain, assignments are made by the Chairman. Office hours are determined and set by the faculty member.

14.3 Funding

Funding is supported by department OPS funds.

14.4 Facilities and Library

Generally these are adequate.

15. Media

Televised courses on video tape are offered in the Brevard, South Orlando, and Daytona Centers, and at the Naval Training and Equipment Center. Generally, the courses offered are 6xxx (graduate level) courses.

Presently no formal policies have been established governing royalties and proprietary rights.

This program has been successful and is anticipated to expand.

APPENDIX

ANNUAL REPORT

1982-1983

INDUSTRIAL ENGINEERING AND MANAGEMENT SYSTEMS ENGINEERING MATHEMATICS AND COMPUTER SYSTEMS

Chairman: Dr. G.E. Whitehouse

Faculty: C.S. Bauer, J.E. Biegel, G.H. Brooks, R.D. Doering, C.B. Gambrell, Y.A. Hosni, H.L. Klee, D.G. Linton, R.R. Safford, G.F. Schrader, J.A. Sepulveda, L.L. Smith, S.B. Spain, and C.J. White.

The period 1982-83 has been a busy time for the Industrial Engineering and Management Systems Department at the University of Central Florida. The department is in the process of determining the feasibility of a Manufacturing Systems Center for Central Florida. A number of faculty and students within the department continue to develop computer programs to solve traditional industrial engineering problems, written in BASIC, to be run on the TRS 80, Apple, and IBM PC Microcomputers. This activity is being reported in the Mini/Micro Computer Column in Industrial Engineering Magazine. Over 800 inquiries have been received regarding this activity. Dr. Whitehouse is Editor of this column for IIE.

The publication activity within the department remains high with over 40 articles and presentations. Our faculty attended over 15 Professional Meetings in addition to a number of continuing education experiences including computer graphics, micro-computers, health care, and the human factors. The department hosted the 2nd International and 5th National Computers and Industrial Engineering Conference in March where 140 papers were presented. The faculty taught a number of Continuing Education courses on such subjects as Software Engineering, Use of Micro-Computers by the Industrial Engineer, Computer Graphics and Project Engineering.

The department was involved in a number of sponsored and unsponsored research activities. The faculty are principal investigators on contracts at a level in excess of \$250,000. Projects include Factory Modeling, Heat Waste Recovery, Industrial Productivity, Health Delivery Programs, Industrial Safety, Navy Student Flow Simulation Models, Solar Passive Energy Management and Project Management. Twenty graduate students have been actively working on research reports and theses.

Dr. Bauer was selected as "Outstanding Teacher" in the Engineering College. He is the President-Elect of the Central Florida Chapter of the Florida Engineering Society (FES). Dr. Doering is a representative on FES's Energy Committee and serves as Director-Elect of IIE's Energy Division. He was re-elected as Regional Vice President to Alpha Pi Mu and was elected as "Outstanding Researcher" in the Engineering College. Dr. Gambrell was reappointed to ABET's Board of Directors. Dr. Gambrell is presently on leave and is Vice President and

Provost at West Coast University, and is expected back in August. Dr. Linton was the director of the local IIE Chapter and Prof. White was the treasurer. Drs. Klee, Hosni, Linton and Whitehouse served as reviewers for the International Journals. Dr. Hosni attended a number of seminars as a faculty guest of the Material Handling Institute. Dr. Whitehouse and Dr. Hosni are Editors of the IIE Micro-Software Series. Dr. Doering was elected "Fellow" of FES and Dr. Whitehouse was elected "Fellow" of IIE. Dr. John Biegel of Kansas State and Dr. Leighton Smith of the University of Texas at Arlington joined the faculty in the Fall. Dr. Robert Safford of U. of Arkansas spent his sabbatical at UCF and helped with our Human Engineering activities.

The College of Engineering Computing Laboratory under the direction of the IEMS Department continues to grow. Areas of emphasis include Computer Graphics, Mini/Micro Computer Systems, Computer Speech, Physical Modeling and Robotics.

The IIE Student Chapter won the "Award of Excellence" from the National IIE Organization. The UCF chapter of Alpha Pi Mu initiated 15 members and won First Place in the Engineering Fair. Students David Noller and Donald Washburn were named as two of three national winners of Armstrong Cork's Outstanding Industrial Engineering Student Awards. Student Leslie Turner won the State and National Consulting Engineer's Scholarship. Dr. Whitehouse won the IIE's Computer and Information Systems Division Award for 1982.

IEMS/EMCS PUBLICATIONS

Books and Monographs

None.

Articles Published

1. Doering, R.D. "Energy Management," Book Review, Management Monitor, Buckinghamshire, England.
2. Doering, R.D. "Effective Cost Cutting With Energy Planning," Food Service Marketing, March 1983.
3. Hosni, Y.A., et al. "Continuous Variations in Parametric Linear Programming," Journal of Computers and IE, January, 1983.
4. Klee, H.I. "Solar Economics - Short Term Costing," International Journal of Computers and Industrial Engineering, Vol. 6, 1982.
5. Whitehouse, G.E., et al. "Multiple Regression," Industrial Engineering, June, 1982.
6. Whitehouse, G.E., et al. "Linear Programming," Industrial Engineering, January, 1983.
7. Whitehouse, G.E. "The Use of Semi Probabilistic Grading to Motivate Decision Analysis Students," Engineering Economist, June, 1982.
8. Whitehouse, G.E. "Flowgraphs," Encyclopedia of Statistical Sciences, Vol. III, John Wiley, April, 1983.

PRESENTATIONS

International Meetings

1. Bauer, C.S. "An Industrial Engineering Lab Approach to CAD/CAM/Robotics Systems Training and Research," Proceedings, 12th Annual Frontiers in Education, ASEE, Columbia, South Carolina, October 82.
2. Bauer, C.S. "Multifunction Laboratories for Academic IE Curricula," 5th National and 2nd International Conference on Computers and Industrial Engineering, Orlando, March, 1983.
3. Bauer, C.S., et al. "Multiple Microprocessor Control of Physical Process Models," 5th National and 2nd International Conference on Computers and Industrial Engineering, Orlando, March, 1983.
4. Biegel, J.E. "CAM and the IE," 5th National and 2nd International Conference on Computers and Industrial Engineering, Orlando, March, 1983.
5. Brooks, G.H. "Materials Requirement Planning Using a Micro-computer," 5th National and 2nd International Conference on Computers and Industrial Engineering, Orlando, March, 1983.
6. Brooks, G.H. "Pascal Paradigms for Personal Processors," 5th National and 2nd International Conference on Computers and Industrial Engineering, Orlando, March, 1983.
7. Doering, R.D., et al. "The Mechanical Engineering Energy Systems Program at the University of Central Florida," ASEE Annual Conference Proceedings, June, 1982.
8. Doering, R.D. and Bauer, C.S. "A Low Cost Based Training Simulator for Wastewater Plant Operators," Proceedings, Winter Simulation Conference, San Diego, California, December, 1982.
9. Doering, R.D. "Effective Cost Cutting with Energy Planning in Equipment and Systems," Proceedings of the 39th SAFSR Conference, The State-of-the-art, Lake Buena Vista, Florida, April, 1983.
10. Doering, R.D., et al. "Modeling and Simulation Activities at EPCOT," Half-Day Tutorial, 5th National and 2nd International Conference on Computers and Industrial Engineering, Orlando, March, 1983.
11. Hosni, Y.A. "Optimum Facility Location and Relative Allocation Problem on the Microcomputer," TIMS/ORSA, National

Conference, Chicago, Illinois, April, 1983.

12. Hosni, Y.A. "Industrial Facilities Layout Algorithms," 5th National and 2nd International Conference on Computers and Industrial Engineering, Orlando, March, 1983.
13. Hosni, Y.A., et al. "Wage Bargaining Simulation," 5th National and 2nd International Conference on Computers and Industrial Engineering, Orlando, March, 1983.
14. Klee, H.L. "An Empirical Procedure for Evaluating the Effectiveness of Energy Conserving Products," 5th National and 2nd International Conference on Computers and Industrial Engineering, Orlando, March, 1983.
15. Linton, D.G., Whitehouse, G.E., et al. "A SLAM Model of the Computer Managed Instruction System," ORSA/TIMS 1982 Joint National Meeting, San Diego, California, October, 1982.
16. Smith, L.L. "The Effects of Exposure Time, Retention Time on Location Memory in Visual Information Processing," Proceedings of the 26th Annual Conference of the Human Factors Society, Seattle, Washington, October, 1982.
17. Sepulveda, J.A., et al. "Evaluating the Effectiveness of At-Scene and During Transportation Treatment by Emergency Vehicle Personnel," 5th National and 2nd International Conference on Computers and Industrial Engineering, Orlando, March, 1983.
18. Whitehouse, G.E.; Hosni, Y.A.; and Linton, D.G. "Tailoring Your IE Application for Solution on a MicroComputer," Proceedings of IIE Annual Meeting, New Orleans, Louisiana, May, 1982.
19. Whitehouse, G.E. "What is the Best Algorithm to Solve the Resource Allocation Problem? Who Cares?" Proceedings of the IIE Annual Meeting, New Orleans, Louisiana, May, 1982.
20. Whitehouse, G.E.; Linton, D.G.; et al. "Using Microcomputers in Simulation Studies," Proceedings, 10th IMACS Conference, Montreal, Canada, August, 1982.
21. Whitehouse, G.E., and Hosni, Y.A. "Use of Microcomputers by IE Departments," Proceedings of National ASEE Conference, College Station, Texas, June, 1982.
22. Whitehouse, G.E. "What's New with Micros." Address to National Association of Furniture Manufacturers Conference, Louisville, Kentucky, September, 1982.
23. Whitehouse, G.E. "Developing User-Friendly Programs," 5th National and 2nd International Conference on Computers and Industrial Engineering, Orlando, March, 1983.

Regional Meetings

1. Bauer, C.S. "Robotics." Ninth Annual Florida State Symposium for Engineers and Scientists, Society for Women Engineers, Orlando, November, 1982.
2. Doering, R.D. "The Potential for Waste Heat Recovery in Florida," Volusia Manufacturers Association Energy Seminar, Daytona Beach, June, 1982.
3. Doering, R.D. "Comparison at Low Temperature and Conventional Dishwasher Systems," Georgia Environmental Health Association Annual Education Conference, Jeckyll Island, Georgia, July, 1982.
4. Doering, R.D., et al. "Passive Solar and Low Energy Building Design Residential Conservation Demonstration Project," Technical Symposium, Florida Solar Coalition Annual Conference, Winter Park, November, 1982.
5. Hosni, Y.A., et al. "Continuous Variation in Parametric Linear Programming," 47th Annual Meeting of Florida Academy of Sciences, FIT, Melbourne, April, 1983.
6. Hosni, Y.A. "Computerized Authoring System for Training Manuals," Proceedings Southeastern '83, IEEE Publication, Orlando, April, 1983.
7. Whitehouse, G.E. "Micros and IE," Keynote Address at Quaker Oats IE Conference, New Orleans, Louisiana, May, 1982.
8. Whitehouse, G.E. "Microcomputers and the IE Decision Maker," Keynote Address, IE/Micro Conference, Johnson City, Tennessee, March, 1983.
9. Whitehouse, G.E. "Microcomputers in the Classroom," North Carolina A&T, Greensboro, North Carolina, April, 1983.

Other Scholarly Works

1. Whitehouse, G.E., and Hosni, Y.A. IEE Micro Software
Network Analysis - APPLE Version, May, 1982.
Work Measurement - TRS Version, August, 1982.
Work Measurement - APPLE Version, August, 1982.
Published by IEE, Atlanta, Georgia.

DEPARTMENT OF INDUSTRIAL ENGINEERING
AND MANAGEMENT SYSTEMS
ENGINEERING MATHEMATICS AND COMPUTER SYSTEMS

Seminars, Special Programs
And Eminent Speakers

1. 5th National and 2nd International Conference on Computers and Industrial Engineering, Hilton Inn, Orlando, March, 1983. (G.E. Whitehouse, Chairman).
2. "Microcomputers and Industrial Engineering," Las Palmas Inn, Orlando, September, 1982. (Whitehouse/Bauer/Hosni).
3. "Training Device Simulation Software," Hyatt Hotel, Orlando, November, 1982. (Hosni/Amico)
4. "Software Engineering and Design," Hilton Inn, Orlando, March, 1983. (Hosni/Bauer).
5. "Programming a Microcomputer for Industrial Engineering Programs," Hilton Inn, Orlando, March, 1983. (Linton/ Whitehouse).
6. "Training Device Simulation Software," Langford Hotel, Winter Park, April, 1983. (Hosni/Amico)
7. "Microcomputers and Industrial Engineering," Las Palmas Inn, Orlando, January, 1983. ((Whitehouse/Bauer/Hosni).
8. "Engineering Project Management," Howard Johnson's, Orlando, February, 1983. (Doering/Whitehouse).
9. "Microcomputers and Industrial Engineering," Las Palmas Inn, Orlando, June, 1982. (Whitehouse/Bauer/Hosni).