



MEMORANDUM

4/5/01
Star, approve.
SG

To: Edward T. Foote II, President

From: Steven Green
Chair, Faculty Senate

A handwritten signature in black ink, appearing to read "Steven Green".

Date: 29 March 2001

Subject: Faculty Senate Legislation #2000-20(B) - Approval of the College of Engineering Manufacturing Research Institute

The Faculty Senate, at its 28 March 2001 meeting, voted to approve the name of a sponsored institute, the College of Engineering Manufacturing Research Institute, for the period of time of continuous funding and any extensions thereafter.

This legislation is now forwarded to you for your action.

SG/kl

cc: Luis Glaser, Provost
M. Lewis Temares, Dean of the College of Engineering
Shahib Asfour, Professor and Chairman, Department of Engineering

CAPSULE: Faculty Senate Legislation #2000-20(B) - Approval of the College of Engineering
Manufacturing Research Institute

RESPONSE BY THE PRESIDENT: Approve DATE: 4/5/01

OFFICE OR INDIVIDUAL TO IMPLEMENT: Provost

APPROVED: [Signature]

EFFECTIVE DATE OF LEGISLATION: _____

NOT APPROVED AND REFERRED TO: _____

REMARKS (IF NOT APPROVED): _____

College of Engineering Manufacturing Research Institute

Introduction

The University of Miami undergraduate Manufacturing Engineering program is managed by the department of Industrial engineering. It is an EAC/ ABET accredited program. 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 market place. The state subsidy grant program for Florida residents allow a large number (approximately 35 students per year) of talented students to be enrolled in the undergraduate manufacturing engineering program at the University of Miami. All of the subsidized students pay the state equivalent tuition amount only.

Due to a growing demand for manufacturing engineers with advanced analytical and problem solving skills, the department of industrial engineering has recently developed and approved a practice oriented Master's degree program in manufacturing engineering. This program has already attracted a number of state as well as foreign graduate students. The demand for manufacturing engineers in design, manufacturing and R&D in the state of Florida is increasing and is expected to grow as shown in Table 1. Our customer group comprises primarily of local metal cutting, electronic, plastics and a large number of medical device industries. To name a few, the Cordis Corporation - a Johnson and Johnson company; Beckman Coulter Corporation; Symbiosis Corp.; Motorola Corporation; Mark Two Engineering, Southern Gear and Machine Corporation and Gables Engineering Corporation. The growth of the medical device industries has expanded well into the "Biomedical Corridor" in Miami - Dade county; This area of South Florida continues to attract a number of medical device manufacturing companies and their subsidiaries.

The academic and research activities of our manufacturing programs are closely coupled to other departments in the College of Engineering at the University of Miami.

College of Engineering Manufacturing Research Institute

1. Objectives

The primary objective of the Design and Manufacturing Research Institute is to train students using real industrial projects and environments in collaboration with industry personnel in order to provide the required pool of engineers for local and regional manufacturing companies.

The second objective is to assist technology - based companies to increase their competitiveness and acquire new technological and management skills.

The third objective is to provide the “seed technical resources” essential to the needs of newly - founded companies by aiding them to develop their products and processes and establish their manufacturing operations.

2. Competency gaps addressed

The proposed institute is designed to address the core requirements of the Society of Manufacturing Engineers (SME) education plan; closing the competency gaps among newly graduated engineers and technologists. It is a mechanism to respond to the expressed needs of industry.

The specific competency gaps addressed are:

- Business Knowledge / Skills
- Problem solving
- Project Management
- Teamwork
- Manufacturing process control
- Manufacturing processes
- Product/ Process design
- Quality

3. Structure

The Manufacturing Research Institute comprises of eight primary facilities essential to satisfying the objectives stated. Figure 1 depicts the Design and Manufacturing Research Institute structure.

Other resources available to the Institute include:

- A multimedia conference room
- A reference library
- A university wide library

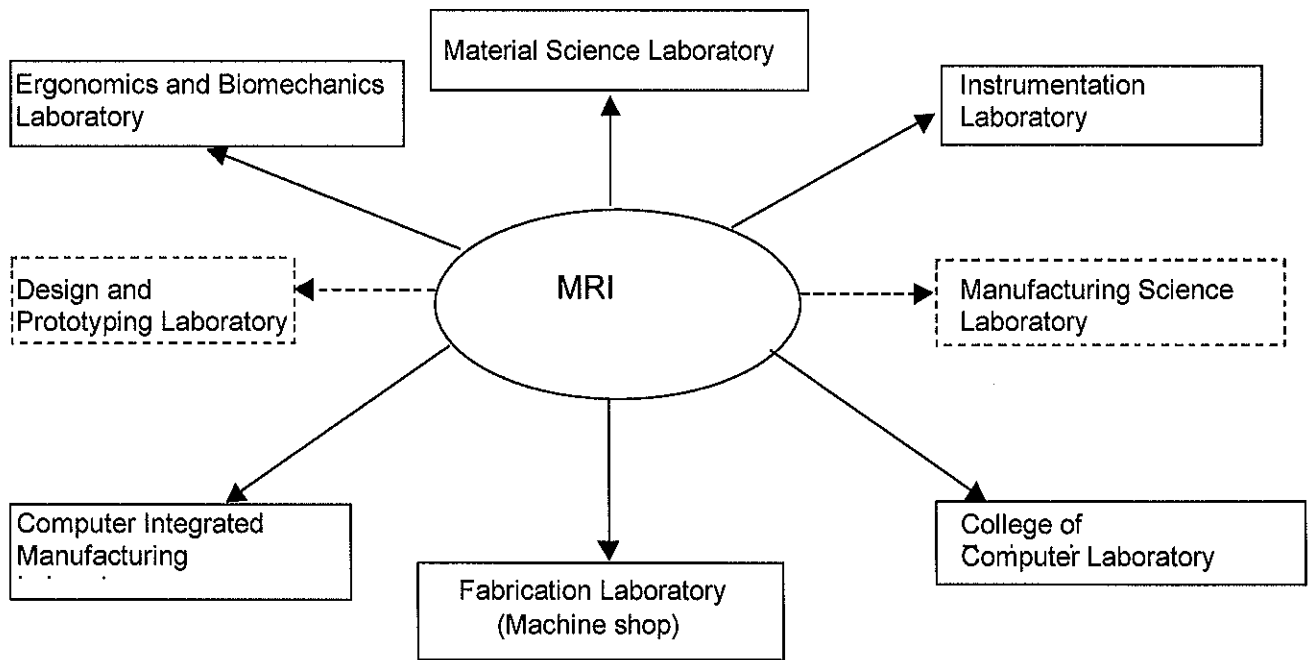


Fig.1 Manf. Research Institute

———— Existing Laboratories
 - - - - - Laboratories to be developed

4. Existing facilities

The following facilities are all used to support manufacturing student's courses:

a) Material Science Laboratory

The material science laboratory is equipped to train students on a number of mechanical instruments including hardness testing, heat treatment and material properties.

b) Computer Integrated Manufacturing Laboratory

The laboratory is equipped to provide students with knowledge and skills in manufacturing automation. Major equipment includes: four industrial assembly robots, a material handling system, a CNC Bridgeport milling machine and feeding systems.

c) Fabrication and Electronic laboratory

This facility is equipped for general machining and forming, welding, woodworking and some electronic fabrication and repair. Major equipment includes: two Bridgeport mills, three lathes, two grinders, a cold cutting saw, one glass blasting machine and a heliarc welder.

d) Instrumentation Laboratory

This facility is equipped with a number of technologies to perform circuit design and testing, acoustic measurements, and spectral analysis. It is an essential resource to train students to be proficient in manufacturing process monitoring and control.

e) Ergonomics and Biomechanics laboratory

This facility comprises of a number of computing and hardware technologies to design tasks and medical hardware including orthotic devices and biomedical implants.

f) College of Engineering Computer Laboratory

This laboratory is equipped with 25 personal computers, connected by a network served by the college of engineering server. This supporting facility allows students to have access to a number of software's to support their projects as well as access to a large number of databases and relevant information through the internet.

5. Technical Leadership

The Manufacturing Research Institute technical collaborative group comprises of specialists from Manufacturing, Mechanical, Environmental, Biomedical, Electrical and Computer Engineering and management programs from within the University of Miami, and engineering staff from industry. (Please refer to Appendix A).

6. Management Plan

While the home department of the Manufacturing Research Institute will be the department of

Industrial Engineering, faculty and students with compatible interests from throughout the college of engineering, the business school or other entities such as the medical school will participate. The organizational structure of the institute consists of 1) a manufacturing faculty member as director (Dr. N. Boubekri), who oversees all functions and serves as industrial liaison, 2) a manufacturing faculty member as associate director (Dr. S. S. Asfour), who assists in technical, administrative and fund raising activities, 3) a manufacturing advisory council that reviews the activities of the , reviews the manufacturing programs and provides guidance, 4) an administrative assistant who perform daily administrative activities of the institute and 5) Technical and managerial teams that include faculty and industry consultants.

7. Business Plan

Funding for the Manufacturing Research Institute is sought primarily from local and regional manufacturing companies. Plans to seek funding from local, state and federal agencies including Florida Department of Education and the National Science Foundation are being considered. We have already secured \$30,000 from Cordis Corporation and Coulter Corporation.

Institute Director
BIOGRAPHICAL SKETCH

NAME

Nourredine Boubekri

POSITION TITLE

Associate Professor
Department of Industrial Engineering
University of Miami

INSTITUTION AND LOCATION

Boston University

DEGREE

B.S

YEAR(S)

1980

FIELD OF STUDY

Manufacturing Engineering

Boston University

M.E

1980

Manufacturing Engineering

University of Nebraska at Lincoln

Ph. D

1983

Industrial Engineering

NUMBER OF YEARS SERVICE ON THIS FACULTY

13 years, 1983-1985 and 1988 to present

TEACHING EXPERIENCE

- University of Nebraska at Lincoln, Nebraska(1980-1983)
Instructor, Department of Industrial Engineering. Courses taught at the University of Nebraska include: Manufacturing Processes I; Manufacturing Processes II; Engineering Economy
- University of Miami, Coral Gables, Florida(1983-1985)
- University of Miami, Coral Gables, Florida (January 1988-June 1993)
Assistant Professor, Department of Industrial Engineering
Associate Professor, Tenured, Department of Industrial Engineering.
Courses taught at the University of Miami include: Manufacturing Processes; Robotics; Advanced Manufacturing Methods; Computer Integrated Manufacturing; Manufacturing Analyses and Product Design; Automatic Assembly; Computer-Aided Manufacturing; Production Management; Statistics; Engineering Economy

INDUSTRIAL EXPERIENCE

Haut Commissariat A La Recherche, Algeria (1985-1987) Robotics Laboratory Researcher
Application of robot technology.
Center National de Recherche, Paris, France (1987-Jan 1988) CAM and Robotics Laboratory,
Researcher

PUBLICATION OF LAST 3 YEARS

Refereed Journal Articles

Boubekri N., "A Technology Enabler for Supply Chain Management", *Integrated Manufacturing Systems Journal*, Vol 12, No. 6, 2000

Boubekri, N. and Chakraborty P., "Modeling of Robot Grasping Strategies for Stable Prehension by a Robot Hand for Rotational and Prismatic Component's", *International Journal of Flexible Automation and Integrated Manufacturing*, Vol 7, (3&4), 1999.

Eldeeb, H., Boubekri N., "A Neural Network Application for Robot Manipulation", *International Journal of Flexible Automation and Integrated Manufacturing*, Vol. 7, 1999.

Boubekri N., R.H. Rambhia, "Strategies for Equipment Design and Selection in Robotic Assembly", *International Journal of Flexible Automated and Computer Integrated Manufacturing*, Begell House Publishers, vol 5, (1&2), 1997

Boubekri N., Ramanujam,G., "Design of Robot Grasping Methodologies for Rotational Assembly Component's", *International Journal of Flexible Manufacturing Systems*, Kluwer Academic Publishers, vol. 7, No. 4, pp. 373-388, 1996

Conference articles

Boubekri, N., Chakraborty P. and Sungkhaopong A., A performance of CBN and ceramic tools in dry turning of gray cast iron, *Pacific Conference on Manufacturing Proceedings*, 2000

Boubekri, N., Challenges of Manufacturing: A look at the future, *International Management of Technology Conference*, Cairo Egypt, 1999.

SCIENTIFIC AND PROFESSIONAL SOCIETIES OF WHICH A MEMBER

Affiliate Member, Society of Manufacturing Engineers
Member, American Society for Engineering Education

HORNORS AND AWARDS

Nominated and approved as ABET evaluator of Manufacturing Engineering Program; 1996
Vice-chair; Council on Manufacturing Education Chairs (COMEC), May 1999 to present

SPECIFIC PROGRAM IN WHICH FACULTY MEMBER HAS PARTICIPATED TO IMPROVE PROFESSIONAL TEACHING COMPETENCE

International conference on education in manufacturing, 1998
International conference on education in manufacturing, March 1996

Institute Assistant Director
BIOGRAPHICAL SKETCH

NAMEPOSITION TITLE

Shihab S. Asfour, PhD

Professor & Chairman
Department of Industrial Engineering
University of MiamiINSTITUTION AND LOCATIONDEGREEYEAR(S)
(if applicable)FIELD OF STUDY

Alexandria University, Alexandria, Egypt

BS

1973

Production Engineering

Alexandria University

MS

1976

Production Engineering

Texas Tech University, Lubbock, TX, USA

Ph.D.

1980

Industrial Engineering

RESEARCH AND PROFESSIONAL EXPERIENCEDissertation

Asfour, S.S., "Energy Cost Prediction Models for Manual Lifting and Lowering Tasks", Ph.D. Dissertation, Texas Tech University, Lubbock. Texas, 1980.

INSTRUCTIONAL EXPERIENCE

1988-present Professor- Industrial Engineering, University of Miami

1988-present Professor- Neurological Surgery, University of Miami

1997-present Professor- Biomedical Engineering, University of Miami

PROFESSIONAL EXPERIENCE

1973-present , Consultant to Industrial Service and Educational Organizations

SELECTED PUBLICATIONSAsfour, S.S, Namini, A.H., Latta, L.L, and Bonilla, M., "A Force-Strain Transfer Matrix Technique for Estimating Forces in a Knee Brace from Selected Strain Measurements", *Seventh Annual Pre-ORS Symposium on Computational Methods in Orthopaedic Biomechanics*, Orange, California, January 31, 1999.Asfour, S.S, Iakovou, E., and Cortes, G., "An Application of Quality Function Deployment in the Design of a Medical Device", *10th Anniversary Symposium on Quality Function Deployment*, Novi, Michigan, June 14-16, 1998.Ata A, Elkhoga S. Shataby M, and Asfour SS, "Causal inverse dynamics of a flexible hub-arm system through Liapunovs second method", *Robotica* 14:38 1-389. 1996Ata A. Shahin A, Asfour S.S. "Design of an industrial flexible robot controller using MatLab", *Computers and Industrial Engineering*. 1996 3 I. No. 1/2, 131Fahmy, Asfour SS, and LM. Jomoah (1997) "Total Mechanical Energy Expenditure In Manual Material Lifting", *Advances in Occupational Ergonomics and Safety ii*Fahmy, AR. Ismail (1997) "Analysis of Kinematic Data: A Comparative Study of Several Techniques", *Advances in Occupational Ergonomics and Safety ii*