PROPOSAL 25-04

MINOR IN MANUFACTURING

Department of Mechanical Engineering - Engineering Mechanics

Introduction

This proposal recommends establishing a formal 'Minor in Manufacturing'. There has been a long-standing history of a manufacturing emphasis in the Department of ME-EM. In this new era of global and decentralized manufacturing, the skills of manufacturing engineers are in increasing demand. Thus, manufacturing engineers are well positioned to thrive in the new economy. The Department of ME-EM has one of the strongest manufacturing research programs as well as some of the finest faculty members in the U.S. Until 1999 an emphasis in manufacturing in ME-EM was available to students as one path through various manufacturing technical electives. However the ME-EM curriculum has been restructured since 2000. Consequently, an emphasis in manufacturing in ME-EM is no longer available to students. Therefore, it is imperative that a Minor in Manufacturing be available to students so that they can develop the skills required for manufacturing engineers.

I. Title of Minor

Minor in Manufacturing

II. Catalog Description

This ME-EM department minor develops a systems approach to problem solving, providing students with an understanding of all the internal and external forces that can affect manufacturing processes and systems. The course selections provide exposure to many components of manufacturing, such as, statistics, industrial engineering, total quality concepts, and business. The student has the opportunity to achieve specialized education in manufacturing, industrial design or business areas. This minor is most suitable for students in the ME-EM department.

III. Rationale

In the new era of global and decentralized manufacturing, where supply chain management is critical, engineers with skills in manufacturing are in increasing demand. Thus, engineers with a background in manufacturing are well positioned to thrive in a new economy based on the generation and processing of information. Manufacturing engineers deal with all aspects of the production processes that manufacture a huge variety of indispensable, innovative, high-tech, and, at times, mission-critical products we depend upon. Although resources are not currently available at this university to develop a comprehensive Manufacturing Engineering degree program, many of the courses in such a program are presently offered within the Department of Mechanical Engineering - Engineering Mechanics and the School of Business and Economics. Defining a coherent selection of courses that lead to a minor in manufacturing seems a logical first step toward developing a Manufacturing Engineering degree at such time when student interest and university resources allow it.

IV. List of Courses

Required Courses (7 credits):

EC3400 Economic Decision Analysis	3
MEEM2500 Integrated Design and Manufacturing	4

Elective Courses (12 Credits)

Choose 6 credits from Process Courses:

MEEM4610 Advanced Machining Processes	4 **or**
MEEM4610D Advanced Machining Processes	3
MEEM4615 Metal Forming Processes	4 **or**
MEEM4615D Metal Forming Processes	3
MEEM4620 Metal Forming & Cutting Machines	3
MEEM4625 Precision Manufacturing and Metrology	3
MEEM4635 Design with Plastics	3
MEEM4640 Micro-manufacturing Processes	3
MEEM4993D Design for Manufacturability	3
MY4130 Principles of Metal Casting	3
ENG3966 Design for Manufacturing	1

NOTE: Courses with a 'D' designation are available only to Distance Learning students participating in the BSE or Certification programs at our participating Industrial Partners.

Choose 6 credits from System Courses:

MEEM4650 Quality Engineering	3
MEEM4655 Production Planning	3
MEEM4660 Data Based Modeling	3
MEEM4665 Manufacturing System Simulation	3
MEEM4675 Materials Handling - Plant Layout	3
MEEM4685 Environmentally Responsible Design Manuf.	3
MEEM4705 Automation and Robotics	4
BA4620 Supply Chain Management	3
BA4690 Systems Thinking and Dynamic Modeling	3

Total Requirements 19 credits

The following courses listed in the Manufacturing Minor have prerequisites not included above (shown in parenthesis):

BA4620 (BA3610 and BA3800 and BA2110)
BA4690 (UN2002)
EC3400 (UN2002)
ENG3966 (ENG1102)
MEEM2500 (ENG1102 and MY2100)
MEEM4615 and MEEM4615D (MEEM2150)

MEEM4620 and MEEM4640 (MEEM3502)
MEEM4625 (MEEM3700 and MEEM3502)
MEEM4635 (MY2100 and MEEM2150 and MEEM3210 and MEEM3230)
MEEM4650 (MA3710), MEEM4655 and MEEM4665 (MEEM3501)
MEEM4705 (MEEM4700)
MEEM4993D (MEEM4992D and MY2100)
MY4130 (MY2100)

V. Estimated Costs

There is no additional cost in introducing a Minor in Manufacturing. All courses identified above are either required or elective courses available to all students who satisfy course prerequisites. All courses are offered on a regular basis.

Adopted by Senate: 10 March 2004
Approved by President: 30 March 2004