USE OF SMALL COMPUTERS FOR MANUFACTURING CONTROL

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1. INTERFACING MICRO-PROCESSORS TO MANUFACTURING
PROCESS EQUIPMENT. Authors: (L. Plebani, E. Zimmers)
(R. Fosbenner and G. Crouse, Consultants).

This will be essentially a presentation of the state of the
art microprocessor technology. New advances in this technology
greatly simplify the interfacing of analog and digital input sig-
nals to the computer.

This interfacing task is manageable and understandable by
engineers working to improve manufacturing productivity.

The intended audience would be non-electrical engineers such as
manufacturing, mechanical, or industrial engineers. Students
mastering this module should be a more effective member of
a system design team in the manufacturing environment after
graduation.

2. MICROCOMPUTER SIMULATOR FOR USE IN MANUFACTURING ENGINEERING
COURSES. Authors: (L. Plebani, E. Zimmers, R. Fosbenner and
G. Crouse).

This module describes the fundamental operation of a microcomputer
system. Using a simplified assembly language set of instructions
the student will learn fundamentals of computer operation and also
experience development of software.
This system uses almost any available basic interactive computer which will accept ANSI standard FORTRAN. It is anticipated that this module will be particularly useful for curricula which do not have small computer devices (e.g. mini-computers) readily available as part of their manufacturing educational program.

3. BASIC CONCEPTS AND MANUFACTURING ORIENTED EXPERIMENTS IN DIGITAL TECHNIQUES. Authors:

The objective of this module is to bring an understanding of the digital techniques which underlie the operation of devices used as part of a broad spectrum of manufacturing processes. An understanding of these concepts is required for the manufacturing engineer to use effectively use for digital devices available. Emphasis in the experiments is given to examples in manufacturing environment to reinforce the concepts presented.

4. COMPUTER-AIDED DESIGN I: Authors: (E. Zimmers, T. Shank, S. Mahle of Applicon, Consultant).

This module gives an overall view showing the interrelationships of various functions within a CAD system including the relationship of design, analysis, drafting, process planning, tool design, NC machine programming, and inspection. Excercises include matrix manipulations to demonstrate the method by which the various layers or projections from the basic part model are achieved by an operational CAD system.

MODULE TITLE AND STATUS

This is an extension of the CAD 1 Module. It will emphasize the handling of electronic data in the manufacturing part of an integrated CAD/CAM system. Exercises will involve developing an understanding of the path and processing which electronic data describing a part undergo during the conversion of design information to information required for manufacture and inspection.

6. **FLEXIBLE MANUFACTURING SYSTEMS**: (Paul Hays, Ingersoll Rand)

The objective of this module will be to present to the student concepts involved in overall system control and the control of individual machines. Examples will be taken from an Ingersoll Rand facility and currently operational systems at similar facilities. Several case studies will be included in exercises involving economic analyses in the system design and justification.

Committee members include:

Paul Hays - Ingersoll Rand
Lou Plebani - Lehigh University
Roger Fosbenner - Western Electric
Gary Crouse - Bethlehem Steel Research
Chuck Setler - Westinghouse Corporation
Emory Zimmers - Lehigh University

In addition, I assume that we should include Les Colwell, University of Michigan and Spiros Papaioannon, Boston University although I have not talked to them for about a year now.

The 7th module is being discussed currently with Chuck Setler at Westinghouse on direct numerical control (DNC). This will be an extension of several numerical control oriented modules previously prepared for MAPEC. However, I think it is premature to commit to a specific title and description at this time.
MEMO TO: The Lehigh Faculty

FROM: Professor E. W. Zimmers, Chairman, The Provost's Academic Planning Committee

January 12, 1981

You are invited to hear Dr. Bob Shirley, a widely experienced consultant in academic planning, speak on the subject of Academic Planning on Friday, January 16th at 3:00 PM in Packard Lab., Room 466.

This talk is being sponsored by the Provost's Academic Planning Committee, which has invited Dr. Shirley to join us and give us the benefit of his experience. I believe that you will find his talk interesting and relevant to the planning effort at Lehigh. His talk will further develop information and concepts reported in the Brown and White (11/14/80) and discussed at faculty meetings, concerning academic planning. There will be an opportunity for you to ask questions.

EWZ/abs