An investigation of learning styles was jointly conducted by the Fox Valley Technical Institute and the Center for Vocational Technical and Adult Education at the University of Wisconsin at Stout. After a study of learning styles, a computerized model to manage an instructional system was developed. Analysis of information necessary to manage a learning-styles-based instructional system was used to develop a model consisting of learner-instructor-computer interactions. A series of computer programs written for a time-sharing system were designed according to the model, and the computer management system was tested using a basic physics program. (CH)
Final Report

Sub-Project to Fox Valley Technical Institute (VTAE District 12)
Project No. 12-103-151-224

Allen Hilgendorf, Director

Center for Vocational, Technical and Adult Education
University of Wisconsin-Stout
Menomonie, Wisconsin

INVESTIGATING THE INTERACTION OF LEARNING STYLES AND TYPES OF LEARNING EXPERIENCES AND ASSESSMENT OF THEIR IMPACT ON LEARNING IN POST-SECONDARY VOCATIONAL-TECHNICAL EDUCATION PROGRAMS: PHASE II
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The research reported herein was performed pursuant to a grant or contract with the Wisconsin Board of Vocational, Technical and Adult Education, partially reimbursed from an allocation of Federal funds from the U. S. Office of Education, U. S. Department of Health, Education and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official State Board of U. S. Office of Education policy or position.
Acknowledgements

The researcher is indebted to Fox Valley Technical Institute and the Wisconsin Research Coordinating Unit for their support of the research described in this report. Special recognition is due Dr. Urban Oen, Director, Learning Styles Project at FVTI. His assistance and counsel were very helpful.
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I. INTRODUCTION

Summary

A learning styles project jointly proposed by Fox Valley Technical Institute, District 12, and the Center for Vocational, Technical and Adult Education at UW-Stout was funded by the Wisconsin Board of Vocational, Technical and Adult Education. During the 1972-73 academic year the University of Wisconsin - Stout sub-contracted with FVTI to conduct a portion of the research for the first phase of the learning styles project. (Banks, 1973) The second phase of that sub-contract involved the development of a computerized model to manage an instructional system in which information about student's preferred style of learning would be considered in prescribing learning activities corresponding to that style.

A model schema consisting of learner-instructor-computer interactions was developed by analyzing the types of information necessary to manage a learning styles based instructional system. A series of computer programs written in BASIC for the PDP-11 time-sharing system were designed according to the model logic. (The model could also be used to develop similar programs in other languages.) The computer management system was tested using the modules and alternative learning activities constructed for a basic physics program at UW-Stout.

The system performed all expected management processes and output unique learning prescriptions based on learning styles. A complete evaluation system was included in the model, however due to insufficient time and input data, that component was not tested.
Instructors who analyzed the system agreed that the management component would be useful or necessary to manage a modularized instructional system. Several instructors and administrators who reviewed the system expressed concern over the procedure used to relate the learning activities to learning styles and recommended a more systematic approach to that process.
Rationale

Individualized instruction is recognized as an educational approach necessary to provide for the many individual differences that exist among students. This need to provide individualized instruction is suggested in learning theories and is the focus of much current educational research.

Although the need for providing individualized instruction has been recognized, some basic problems tend to deter its implementation. One of those problems involves the handling of large amounts of information connected with managing a system in which each student may be at different points in the course and require different materials to learn a given concept or skill.

Computerized systems are now available to help with all levels of this management task. By maintaining student records on a computer storage device and by continually monitoring a student's progress via on-line terminals, the teacher has access to daily progress reports. More sophisticated systems can provide a more detailed analysis of students' progress, suggest assignments and conduct on-line evaluation. With the present availability of moderately priced time-sharing equipment, the previously difficult bookkeeping problem involved in managing individualized instruction appears to be diminishing.
As the management of individualized, prescriptive, instruction becomes feasible another more fundamental problem concerning the criteria used to prescribe instruction must be considered. Learning style has been under investigation recently as a variable which tends to interact with various modes of instruction. As more evidence of this interaction becomes available, it appears that a computerized management system can be used, in fact, will be necessary, to prescribe those learning activities which best match the learning styles of the learner.
Problem

This project was part of a more comprehensive project involved with identifying learning styles of students and assessing their impact on learning in the post-secondary vocational-technical education program. (Oen, 1973) The problem for this sub-project was to develop a model for the computer logic required to store, summarize and retrieve the student and instructor information required to manage a learning styles based individualized instructional system.
Objectives

The specific objectives for this sub-project were to:

1. Develop a list of the information teachers and students need in order to manage and function within a learning styles based individualized instructional system.

2. Design an instructional information system model.

3. Identify the computer program logic, inputs and outputs required for the instructional information system.

4. Determine the feasibility of an on-line interactive terminal system for input and output of the instructional data used in the instructional information system.
II. REVIEW OF RELATED LITERATURE

In a review of research on computer-based instructional management systems, Baker (1971) briefly described several of the earlier management systems. Although each system described by Baker was designed to manage a unique instructional program, all systems included some degree of test scoring, diagnosing, prescribing and reporting. Also, each system incorporated a similar basic model and curricular approach. Objectives within a subject matter area were grouped into instructional units. Pretests were used to determine students' present level of achievement and aid in prescribing instruction. Post-tests were used to determine whether objectives were achieved and detailed computer generated reports were always available to aid teachers in the diagnosing and prescriptive process.

In summarizing his report, Baker indicated that although the reporting aspects of the systems were reported in detail, the procedures for diagnosis and prescription were vague or completely lacking. Baker continued to discuss the problem of prescriptive capabilities of the various systems emphasizing the need for better diagnostic and prescriptive procedures. He concluded that considerable applied and theoretical work was needed on procedures for diagnosing and prescribing in order to develop them to a level adequate for CBIM and CAI systems (Baker, p. 64).
The use of various forms of diagnostic learning prescriptions appear to be promoted by an increased use of computer generated tests. Franklin Prosser and Donald D. Jensen (1971) describe an extensive computer generated testing program at Indiana University in which students are permitted to keep the tests after they have turned in their answers. The students are then given the correct answers in return for their completed answer cards. This provides students with immediate feedback of results along with materials in the form of test questions for further study.

Descriptions of several existing computer generated testing systems include references to various ways in which test results are used to provide prescriptive feedback. Dudley (1973) describes a system in which a listing of the items missed, showing both the student's answer and the correct one, together with a reference to the course material is printed for the student. Hsu and Carlson (1973) use a separate program to print out exercise pages for missed objectives. Libaw (1973) described the MENTREX system which provides individual tutorial feedback and references to specific information sources to reveal what his test reveals that he has not yet learned.

Perhaps the most comprehensive work involving systematic prescriptive capabilities based in learning styles has been done by Dr. Joseph E. Hill (1971) at Oakland Community College in Bloomfield Hills, Michigan. Hill uses cognitive style mapping to obtain a profile of students cogni-
tive styles. That information can then be used to predict which learning activities would be best suited for each student.

III. METHODOLOGY AND PROCEDURE

This project of constructing a learning styles based management system was undertaken in conjunction with another project in developing learning styles based curricular materials in the UW-Stout Physics department. The physics project dealt primarily with modularizing several basic physics courses and designing various alternative learning activities keyed to the objectives. Since the director of the learning styles project was also involved in the physics project, most of the initial testing of the computer programs utilized data which were generated for the physics project. The physic modules were designed for students in technical programs; thus, many of the modules would be appropriate for vocational-technical schools.

Descriptions of the method and procedure for each activity as listed in the project proposal are as follows:

Activity #1.

Using a nominal group approach, determine the instructional information and computer-output data needed by teachers and students in order to create an effective learning environment.

To identify the information involved with managing a learning system the director of this project worked closely with the following
people:

a) Dr. Orville Nelson, Research Specialist
   Center for Vocational, Technical and Adult Education

b) Dr. Steve Fossum, Associate Professor, Physics

c) Dr. Mark Larchez, Assistant Professor, Physics

In individual consultation, Dr. Nelson provided the initial information used in outlining the project and identifying the limitations or boundaries of the information sought. His information was based on meetings with staff at FVTI and involvement in Banks (1973) project. Then, over a period of a few weeks, the director met regularly with Dr. Fossum and Dr. Larchez to discuss what specific information was necessary to develop an individualized instructional system based on learning styles. The information identified was classified according to whether it was associated with students or subject modules, and later formed the two major files in the management system. (See Appendix A)

Activity #2.

Create an instructional information system model.

The information system model was developed by first identifying activities required of instructors and students in a learning center environment where learning activities are prescribed according to individual styles of learning. Next, those activities such as generating learning prescriptions, record keeping, reporting and evaluation were
selected for inclusion in the basic model. The procedures dictated by those activities were then flow charted and integrated to form the system model.

Fundamental to the model is the role of the system as an extremely efficient instructor's aid thereby permitting a greater degree of instructor-student interaction in the learning center. The system prescribes learning activities and controls evaluation procedures while automatically recording information to be processed and presented to the instructor. The instructor uses that processed information to update instructional materials and form the basis for better professional interaction with individual students. (See Appendix B)

Activity #3.

Develop the computer program logic needed to handle the instructional information identified in activity 2.

Using the information determined in activity #1 and the processes identified in activity #2, a computer system consisting of three main files and two groups of programs was planned. The three files included an individual student file, a module file containing information and learning activities for each module and a testing file containing the test items for all modules. (See Appendix C for Module & Student File Layouts) One group of programs which students would need to interact
with the system were outlined and another set of programs which instructors could use to retrieve reports and update the system were identified.

The computer programs necessary to provide adequate learner interaction with the system were identified by constructing a schema depicting the learner, system files and the types of input-output previously discussed. A flow chart of student activities was constructed to provide a sequence which was then used to explicitly define and interrelate each of the computer programs. (See Appendix D for Learner Interaction & Flow of Student Activities)

In the flow of student activities the student first plans his program of study by selecting those modules he plans to study and identifies each module with the date he plans to start that module.

The student then completes a learning styles questionnaire and takes a pre-test, the results of which are entered into the system via an optical reader. The learning styles information is used later to prescribe appropriate learning activities and the pre-test can be used in one of two ways.

The flow chart in Appendix D shows the pre-test used as a pre-entry instrument. In this mode the student demonstrates various entry skills before he is given a learning prescription and is permitted to enter a learning module. The other way in which the pre-test can be used is in testing out of modules. If the pre-test is equivalent to the module post-
tests, then the pre-test information may be used to determine if students can bypass modules.

After students have taken the pre-test and learning styles questionnaire they will enter their name and program of study into the system via teletype or CRT in the learning center. After a program of study (list of modules with starting dates) is entered by a student, that student may approach the system via terminals in the learning center at any time to do one of the following:

a) Change his program of study.

b) Print out his current program.

c) Print out a summary of progress and his current status.

d) Request a learning activities prescription.

e) Request a test on his current module to be taken on-line on a CRT.

(See Appendix D for a List of Computer Programs for Student Use)

The computer programs necessary for instructors to interact with the system were identified by constructing a schema depicting the instructor, system files and the types of input-output previously discussed.

(See Appendix E for Instructor Interaction)

Computer programs which instructors needed formed two groups, those necessary to update information in the system and those used to output reports necessary for efficient management of the learning center. After
students were enrolled and had entered their programs of study, instructors could approach the system via terminals at any time to do one or more of the following:

a) update modules and learning activities in the module file.
b) update test items in the test file.
c) print out the following reports:
   1. Expected Module Entry.
   2. Current Module Use.
   3. Progress List for all students
   4. List of students enrolled.
   5. List and summary of modules available.

(See Appendix E for List of Computer Programs for Instructor Use)

Activity #4.

Write a computer program to simulate the information handling and processing required by the instructional information system.

The computer programs identified in activity #3 were written in the BASIC-PLUS programming language to be executed on the PDP-11 time-sharing computer system at UW-Stout. (See Appendix F for Computer Program Listings)

Two programs, TESTER and TESTUP, comprising the evaluation part of
the system were not written. The decision to continue without those
programs considered the fact that an off-line computer generated testing
system was already in use at UW-Stout. Therefore, the writing of those
programs could be done quickly at a later time. Also, the Center for
Vocational, Technical and Adult Education was working with Fred Timm in
developing a random test generation program for the Communications Skills
courses at FVTI.

Activity #5.

Pilot test the computer program at UW-Stout.

As each computer program was written, it was debugged by executing
the program with explicit input data which would produce predictable
output. Also, when two or more computer programs comprising a sub-system
were completed, they were executed with similar input data. The final
system (excluding the evaluation component) was tested with the same
input data with the resulting output being compared with the predicted
output.

Activity #6.

Write and/or select alternative modes of instruction
for a specific unit and place these in the instructional
information system.

This activity was performed in cooperation with the concurrent

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20
Physics Project in which modules with alternative modes of instruction were being written for a basic physics course. A 5 semester credit basic physics course was divided into 14 modules and each module was outlined according to a specific format. Such things as number, name, prerequisites, alternative learning activities, etc. were stated for each module in such a way as to be easily entered into the computer system. (See Appendix G for Module Format)

Two module entry requirements were considered important for this particular application. These requirements included a list of prerequisite modules for each module and a list of prerequisite entry skills for each module. Most of the modules had other modules as prerequisites, however a few modules had no prerequisites, modules thereby providing several places (areas of study) where students could enter. The prerequisite skills became the pre-test items which were to be administered at the beginning of the course. (See Appendix H for Available Modules for Physics 221 and Prerequisite Skills for Physics Courses)

After all modules for the course were identified according to the module format, a set of explicit behavioral objectives were written for each module. (See Appendix I for Module #125 Objectives) A general list of possible learning activities were selected for each objective. (See Appendix I for Module #125 Activities)

The process of prescribing only those activities which were most
closely matched to the student's learning styles required that each activity be associated with a set of styles. For this particular application two style continua (symbolic-concrete and unstructured-structured) were selected and each activity was assigned a two element array which placed that activity on the two continua. (See Appendix J for Use of Learning Styles to Prescribe Learning Activities)

The last step in preparing the system for operation involved entering the module information. Computer program 'MODADD' was used to enter the basic information about each module as listed in Appendix G. Then 'MODSUM' was used to enter the activities for module #125 as listed in Appendix I.

Activity #7.

Test the feasibility of the alternative modes of instruction as managed by the instructional information system. These tests will be conducted at Fox Valley Technical Institute by means of a portable remote-entry data terminal. This terminal will be placed on line with the PDP 11/40 system based at UW-Stout. Students and teachers will be able to utilize this system and will be requested to evaluate it in terms of its functionality and effectiveness in processing the data they need. A
preliminary cost/benefit analysis will be conducted on the instructional information system.

Since the remote-entry data terminal was not available and FVTI's time-sharing system was not operational the feasibility test was not done at Fox Valley Technical Institute. However a test involving selected faculty and students at UW-Stout was conducted. A one page sample 'Information to Students' sheet was attached to the list of available modules and distributed to several faculty members and students so they could plan a program of study and enter that program into the system. (See Appendix K for Information to Students and a sample of the terminal interaction printout of a student entering and listing his program of study.)

After the students' programs of study were entered they were asked to run the computer program NXTMOD which would provide a Learning Activities Prescription for their first module. However, since only the activities for module #125 were available in the system, only those students who were eligible for that module received a Learning Activities Prescription. (See Appendix L for samples of Learning Activities Prescription)

The computer programs producing the following reports to faculty were also run to complete the system test.

a) Expected Module Entry
b) Progress Report
c) Current Module Activity

d) Module Summary

(See Appendix M for samples of those reports)

In April and May, 1974 the researcher made two presentations to FVTI staff on the model, the system and the types of reports provided for teachers and students. No additional information needs were defined during these meetings.

During Professional Growth Week-II held at UW-Stout during the week of June 4 - 8, 1974, the researcher demonstrated the system and discussed applications with the vocational teachers in attendance.

IV. ANALYSIS

Most of the information determined to be necessary to individualize instruction based on learning styles was used in the model. The student's initial program of study was used to provide reports on expected module use, and all faculty members who tested the system agreed that those reports would be useful in managing instruction in a learning center environment. The learning styles information was used directly to match activities styles to student's learning styles. Actual accumulated pre-test and post-test information was not available for testing because the evaluation component of the system was not completed. However, dummy data was used for this accumulated information thereby permitting a more complete test of the system.
The particular application to which the model was tested used the pre-test component for determining entry requirements. To insure that students entering a particular module possessed those skills needed to perform the learning activities, a pre-test of those skills was given before starting a series of modules. That pre-test information was then entered into each student's file and the system controlled module entry based on the results of the pre-test.

With minor changes in some of the computer programs, the pre-test information could be used to bypass modules instead of permitting entry to those modules. This mode of operation would require that the pre-test test the objectives of each module the student was planning to study.

The key component of the learning styles based system is the output of learning prescriptions in which the activities for each objective are listed in sequence of decreasing compatibility with the student's learning styles. Although the application in which the system was tested required that all activities be presented to all students, it is feasible to list only the first few activities for each objective, thereby prescribing only those activities which best match the styles of the learner.

Appendix L shows learning prescriptions for two students entering the same module. For the two style continua used in the test one student placed average on the symbolic-concrete continuum and toward the unstructured end of the other continuum. That student was given a supple-
mental reading as his best activity for objective #1. The other student placed toward the symbolic end of one continuum and toward the structured end of the other continuum. That student was given a taped mini-lecture as his best activity for objective #1. If the supplemental reading is more unstructured and the taped mini-lecture is more structured in nature one would expect those activities to be assigned to the respective students.

A critical phase in the prescriptive process concerns the procedure by which each activity was placed on the two style continua. For this test each activity was analyzed by the investigator and assigned a position on the style continua. Although analysis from several experienced teachers would be more valid, other methods utilizing feedback within the system should be considered.
REFERENCES


APPENDIX A

INFORMATION NECESSARY TO INDIVIDUALIZE INSTRUCTION BASED ON LEARNING STYLES

Information Associated With Each Student

1. Initial program, history of program changes and current status.
   a) List of modules in program.
   b) Planned dates of entry and exit from each module.
   c) Noted changes in program.
   d) Current status or amount of program completed.

2. Learning styles and accumulated styles information.
   a) Information from learning styles questionnaire.
   b) Accumulated data on styles actually used.

3. Accumulated module entry skills.
   a) List of basic or unique skills demonstrated before entry to each module.

4. Accumulated test results on current module.
   a) List of all items and responses that have appeared on tests on the current module.
   b) Information necessary for constructing subsequent tests.

Information Associated With Each Module

1. Entry skills and prerequisites.
   a) List of prerequisite modules.
b) List of basic or unique skills used in the module and needed by students before entry to that module.

2. Objectives with available learning experiences.
   a) List of behavioral objectives.
   b) List of various activities associated with and/or keyed to the objectives.
   c) Information or algorithm relating the measured learning styles to the various learning activities.

3. Pool or test items.
   a) Several items for each objective.

4. Accumulated information on tests.
   a) Usage, difficulty and correlation of items and groups of items associated with objectives.

5. Accumulated information on use of learning activities.
APPENDIX B

LEARNER-INSTRUCTOR-SYSTEM INTERACTION

Prescribed Learning activities based on styles of learning

Information on styles, tests progress, etc.

Individualized interaction between student and instructor in a learning center environment

Updating instructional materials

Management and statistical information

Computer Managed Instructional System

LEARNER

INSTRUCTOR
APPENDIX C

Module & Student File Layouts
File Name: MOD999

A8(50) __________ LIST OF ACTIVITY NUMBERS __________

S1(50) __________ LEARNING STYLES (A) FOR EACH ACTIVITY __________

S2(50) __________ LEARNING STYLES (B) FOR EACH ACTIVITY __________

C2 A8(50) = 64 __________ DESCRIPTION OF EACH ACTIVITY __________
File Name: STUDNT

N$(N,2) NAME ID. NUMBER FILE NAME

9999 DIM #N, N$(400,2)

SIZE = 38 blocks for 400 students
<table>
<thead>
<tr>
<th>Module</th>
<th>Expected Starting Dates</th>
<th>Accumulated Record of Modules Started</th>
<th>Date Each Module Was Started</th>
<th>Date Each Module Was Completed</th>
<th>Number of Credits and Level of Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1(20)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D8(20)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S8(30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D18(30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D28(30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1(30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

File Name: NAME99
<table>
<thead>
<tr>
<th>E% (30)</th>
<th>ACCUMULATED LIST OF ENTRY SKILLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>T% (D, 120)</td>
<td>ACCUMULATED LIST OF TEST ITEMS FOR CURRENT MODULE</td>
</tr>
<tr>
<td>T% (1, 120)</td>
<td>RESPONSES FOR TEST ITEMS</td>
</tr>
</tbody>
</table>

9999 DIM #N, P% (20), D% (20), S% (30), D1% (30), D2% (30), C1 (30), L% (2), E% (30), T% (1, 120)

SIZE = 2 blocks/student
APPENDIX D
LEARNER INTERACTION

Learning activities prescription

Feedback from Testing

Information & progress reports

Tests and questionnaires

Program construction

Module File

Student File

Testing File
FLOW OF STUDENT ACTIVITIES

START

1) Plan program
2) Learning styles q.
3) Pretest

Enter name & program into comp.

M = first module in program

Pretest for M ok?

yes

Output learning activities prescription for module M

no

Output entry requirement

M = next module in program

LEARNING CENTER ACTIVITIES

Review feedback from tests not passed

Perform activities listed in prescription

Satisfy entry requirements

Pass Test on M

Last Module?

yes

no

END

D-1.
<table>
<thead>
<tr>
<th>Program Name</th>
<th>Program Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAINST - - -</td>
<td>main student program used to identify a student with his file and chain to the program he selects. After that program has been executed the system will chain back to this program and wait for another user.</td>
</tr>
<tr>
<td>ENROLL - - -</td>
<td>enter a new name in the student file in alphabetical order and initialize an individual file for that name.</td>
</tr>
<tr>
<td>PROGRAM - - -</td>
<td>enter or change a program of study for a student. This program will be used by students to enter their planned program of study into their file and update any changes in that program.</td>
</tr>
<tr>
<td>PGMLST - - -</td>
<td>list the program of study for a particular student. This program provides a list of planned modules and expected starting dates in a students program of study.</td>
</tr>
<tr>
<td>STATUS - - -</td>
<td>print out a summary of the history and current status of a student. This program lists all of the modules a student has completed with dates of completion and the level of achievement for each module. The report includes the status of the student on his current module.</td>
</tr>
<tr>
<td>NXTMOD - - -</td>
<td>print out the learning prescription for the next module of a students program. This program will use the learning styles information from the questionnaire to select those learning activities which most closely match the students style of learning.</td>
</tr>
<tr>
<td>TESTER - - -</td>
<td>provides a mastery test on the current module. This program will present the student with a test on a CRT. As the student responds to the items, they are graded and the results are stored in his file. The program will either record if the student passes the module or provide feedback about which objectives require additional study.</td>
</tr>
</tbody>
</table>
APPENDIX E

INSTRUCTOR INTERACTION

- Module usage reports (historical, current & projected)
- Student progress reports (all students)
- Module & test file update
- Test item analysis
- Module File
- Student File
- Testing File
<table>
<thead>
<tr>
<th>Program Name</th>
<th>Program Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>DROPER</td>
<td>delete a student from the system.</td>
</tr>
<tr>
<td>EXPUSE</td>
<td>print out the expected module entry report.</td>
</tr>
<tr>
<td>MODADD</td>
<td>enter a new module in the module file or delete an old module.</td>
</tr>
<tr>
<td>MODSUM</td>
<td>print out a module summary showing the basic features of all modules.</td>
</tr>
<tr>
<td>MODUPD</td>
<td>add, delete or update activities for an existing module.</td>
</tr>
<tr>
<td>MODUSE</td>
<td>print out the current module use report.</td>
</tr>
<tr>
<td>NAMLST</td>
<td>print out list of students enrolled.</td>
</tr>
<tr>
<td>PROGRES</td>
<td>print out the progress list report which shows the current standing of all students.</td>
</tr>
<tr>
<td>SKILLS</td>
<td>add, delete or update entry skills.</td>
</tr>
<tr>
<td>TESTUP</td>
<td>add, delete or update test items in the test file.</td>
</tr>
</tbody>
</table>
APPENDIX F

Computer Program Listings
1000 ON ERROR GOTO 6000
1010 PRINT: PRINT: PRINT
1085 PRINT "1-ENROLL, 2-PRØGRM, 3-PGMLIST, 4-STATUS, 5-NXTMØD, 6-TESTER"
1500 PRINT: PRINT: INPUT N9%
1510 IF N9%>1 THEN 1520
1515 PRINT "WAIT"; CHAIN "ENROLL"
1520 C8=0
1540 INPUT "NAME PLEASE"; N1S
1560 L=LEN(N1S)
1570 OPEN "STUDENT" FOR INPUT AS FILE 1, MODE 1
1580 DIM %L$: NS(400, 2)
1590 N=VAL(NS(0, 0))
1600 FOR J=1 TO N
1610 IF LEFT(N1S, L)=LEFT(NS(J, 0), L) THEN
1620 NEXT J
1630 PRINT "SORRY - BUT I CAN'T FIND YOUR NAME ON THE CLASS LIST."
1640 PRINT "PLEASE USE THE SAME NAME UNDER WHICH YOU ENROLLED"
1650 PRINT "OR TRY ENTERING YOUR LAST NAME ONLY."
1660 C8=C8+1
1670 CLOSE 1
1680 IF C8<3 THEN 1540
1690 PRINT "SEE AN INSTRUCTOR FOR A POSSIBLE ERROR."
1700 G0 TO 9990
1710 IF LEFT(N1S, L)<LEFT(NS(J+1, 0), L) THEN 1780
1730 PRINT "THE NAME YOU ENTERED IS EQUAL TO BOTH OF THE FOLLOWING."
1740 PRINT NS(J, 0); PRINT NS(J+1, 0); PRINT "TRY AGAIN"
1760 CLOSE 1
1770 G0 TO 1540
1780 N1S=NS(J, 0); N2S=NS(J, 1); N3S=NS(J, 2)
1790 CLOSE 1
1800 PRINT "CONFIRM "; N1S; ""; N2S
1810 INPUT "TYPE Y OR N"; N9$
1820 IF N9$="Y" THEN 9990
1830 OPEN "TMP" AS FILE 9
1840 PRINT #9, N1S; ""; N3S
1850 CLOSE 9
1860 PRINT "WAIT"
1870 ON N9% G0 TO 3100, 3200, 3300, 3400, 3500, 3600
3100 CHAIN "ENROLL"
3200 CHAIN "PRØGRM"
3300 CHAIN "PGMLIST"
3400 CHAIN "STATUS"
3500 CHAIN "NXTMØD"
3600 CHAIN "TESTER"
6000 IF ERR<> 19 THEN ON ERROR G0 TO 0
6010 PRINT "WAITING"; SLEEP 5
6020 RESUME
9990 CHAIN "MAINST"
9999 END
ENROLL  01:09 PM       18-JUN-74
1000 ON ERROR G0 TO 6000
1020 PRINT "PLEASE TYPE YOUR LAST NAME FIRST"
1030 INPUT "THEN SPACE AND FIRST NAME" N1S
1040 PRINT "CONFIRM "; N1S; INPUT "TYPE Y OR N" N9S
1050 IF N9S<>"Y" THEN 1020
1060 INPUT "PLEASE TYPE YOUR ID-NUMBER" N2S
1070 PRINT "CONFIRM "; N2S; INPUT "TYPE Y OR N" N9S
1080 IF N9S<>"Y" THEN 1060
1090 OPEN "STUDENT" FOR INPUT AS FILE 1, MODE 1
1100 DIM #1, N$(400, 2)
1110 N=VAL(N$(0, 0))
1120 FOR J=1 TO N
1130 IF N1S<N$(J, 0) THEN 1200
1140 IF N1S>N$(J, 0) THEN 1180
1150 PRINT "YOUR NAME ALREADY EXISTS IN THE FILE"
1160 PRINT "PLEASE CONTACT AN INSTRUCTOR BEFORE ENROLLING."
1170 CLOSE 1: G0 TO 9990
1180 NEXT J
1190 J1=N+1: G0 TO 1225
1200 FOR J1=N TO J STEP -1
1210 FOR K=0 TO 2: N$(J1+1,K)=N$(J1,K): NEXT K
1220 NEXT J1
1225 J9=0
1230 J9=J9+1
1235 N3S=LEFT(N1S, 4)+N$(J9)
1240 FOR K=1 TO N
1250 IF N3S=N$(K, 2) THEN 1230
1260 NEXT K
1270 N$(J1,0)=N1S: N$(J1,1)=N2S: N$(J1,2)=N3S: N$(0,0)=N$(N+1)
1280 CLOSE 1
1290 OPEN N3S AS FILE 2, CLUSTERSIZE 2
1300 DIM #2, P%(20), D%(20), S%(30), D1%(30), D2%(30), C1(30),
L%(2), E%(30), T%(1,120)
1310 P%(0)=0: S%(0)=0: C1(0)=0: E%(0)=0
1320 T%(0,0)=0: T%(1,120)=0
1330 CLOSE 2
1340 PRINT "ENROLLMENT OF "; N1S; " IS COMPLETE"
1345 PRINT "WAIT"
1350 G0 TO 9990
6000 IF ERR<>19 THEN ON ERROR G0 TO 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
9990 CHAIN "MAINST"
9999 END

READY
PROGRAM 01:20 PM 18-JUN-74
1000 ON ERROR G0 TO 6000
1010 OPEN "TMP" FOR INPUT AS FILE 9, MODE 1
1020 INPUT N1$, N3$, N3$
1030 CLOSE 9
1040 OPEN N3$ FOR INPUT AS FILE 1, MODE 1
1050 DIM #1, P%(20), D%(20), S%(30), D1%(30), D2%(30), C1(30), L%(2), E%(30), T%(1,120)
1060 IF P(0)=0 THEN 1200
1070 PRINT "YOUR CURRENT PROGRAM EXISTS OF THE FOLLOWING MODULES:" 7
1080 FOR K=1 TO P(0): PRINT P(K): NEXT K
1090 PRINT "DID YOU INTEND TO CHANGE OR LENGTHEN THAT PROGRAM" 7
1100 INPUT "TYPE Y OR N": N9$
1110 IF N9$<"Y" THEN 9990
1120 IF S(0)<>0 THEN 1130
1122 PRINT "YOUR CURRENT PROGRAM IS NOW DELETED" 7
1124 PRINT "START ENTERING YOUR NEW PROGRAM" 7
1126 G0 TO 1200
1130 K=5(0)
1140 PRINT "YOUR NEW PROGRAM MUST START AFTER MODULE "; S(0)
1150 PRINT "ALL MODULES AFTER "; S(0); "ARE NEW DELETED." "
1160 FOR L=1 TO P(0)
1170 IF S(0)=P(0) THEN 1190
1180 NEXT L: PRINT "ERROR IN PROGRAM AT LINE 1180": G0 TO 9990
1190 P(0)=1: P(0)=P(L): D%(1)=D%(L)
1200 PRINT "ENTER MODULE NUMBERS IN THE SEQUENCE IN WHICH YOU" 7
1210 PRINT "PLAN TO COMPLETE THEM. ALSO ENTER THE DATE YOU PLAN" 7
1220 PRINT "TO START EACH MODULE. LAST MODULE NUMBER SHOULD BE" 7
1225 PRINT "ZERO TO TERMINATE PROGRAM ENTRY": PRINT 7
1230 IF 5(0)>0 THEN C8=2 ELSE C8=1
1240 FOR K=C8 TO 30
1250 INPUT "MODULE ": M1
1252 FOR K9=1 TO P(0)
1254 IF M1<>P(K9) THEN 1258
1256 PRINT M1; "IS ALREADY INCLUDED": G0 TO 1250
1258 NEXT K9
1260 IF M1=0 THEN 1640
1270 OPEN "MOD1.11.E" FOR INPUT AS FILE 2, MODE 1
1280 DIM #2, M%(40),M1$(40)="", M$(40)=32, C2(40), D3%(40,1), R%(40,3), K%(40,10)
1290 M=M(0)
1300 FOR L=1 TO M
1310 IF M(L,0)=M1 THEN 1350
1320 NEXT L
1330 CLOSE 2
1340 PRINT "MODULE ": M1; "IS NOT AVAILABLE": G0 TO 1250
1350 IF R%(L,0)=0 THEN 1510
1360 IF K>1 THEN 1410

READY
1370 PRINT "THAT MODULE HAS THE FOLLOWING PREREQUISITE MODULE(S):"
1380 FOR K1 = 1 TO REL(0): PRINT REL(K1): NEXT K1
1390 CLOSE 2: PRINT "SELECT ANOTHER MODULE OR ENTER ZERO."
1400 G0 TO 1250
1410 FOR K1 = 1 TO REL(0)
1420 FOR K2 = 1 TO P2(0)
1430 IF REL(K1) = P(K2) THEN 1500
1440 IF S(0) = 0 THEN 1480
1450 FOR K3 = 1 TO S2(0)
1460 IF REL(K1) = S2(K3) THEN 1500
1470 NEXT K3
1480 NEXT K2
1490 G0 TO 1370
1500 NEXT K1
1510 D1 = D3(L, 0): D2 = D3(L, 1): CLOSE 2
1515 C9 = 0
1520 GOSUB 7000
1530 IF X8% >= D1 AND X8% < D2 THEN 1590
1540 IF C9 = 0 THEN 1570
1545 X8% = D1
1550 PRINT "FIRST DATE AVAILABLE HAS BEEN ENTERED."
1560 G0 TO 1590
1570 PRINT "STARTING DATE OUTSIDE MODULE AVAILABILITY - TRY AGAIN."
1580 C9 = 1: G0 TO 1520
1590 IF D2 - X8% > 0 THEN 1620
1600 PRINT "WARNING - YOU HAVE ONLY"; D2 - X8% "DAYS"
1610 PRINT "TO COMPLETE MODULE"; M1
1620 P(K) = M1: P(0) = K: D(K) = X8%
1630 NEXT K
1640 IF P(0) = 0 THEN PRINT "NO PROGRAM ENTERED" ELSE PRINT "PROGRAM ENTRY IS COMPLETE"
1645 PRINT "WAIT"
1650 G0 TO 9990
1660 IF ERR <> 19 THEN ON ERROR G0 TO 0
1670 PRINT "WAITING": SLEEP 5
1680 RESUME
7000 X1$ = "JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC"
7010 X2$ = "000031059091201511812243273304334"
7020 X3$ = "0000036507301095"
7030 INPUT "STARTING MONTH-XXX"; X4$
7040 X5% = INSTR(1, X1$, LEFT(X4$, 3))
7050 INPUT "DAY"; X6%
7060 X7% = VAL(MID(DATES(0), 8, 2))
7070 X8% = VAL(MID(DATES(0), 5, 3)) + JAL(MID(X3$, (X7% - 73) * 4 - 3, 4)) * X6%
7080 RETURN
9990 CLOSE 1: CHAIN "MAINST"
9999 END

READY

F-4
Program: PGMLST

CURRENT PROGRAM
XXXXXXXXXXXXXXXX
999-99-9999
99-XXX-99

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>MODULE DESCRIPTION</th>
<th>CREDITS</th>
<th>STARTING DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>999</td>
<td>XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX</td>
<td>.9</td>
<td>99 XXX 99</td>
</tr>
<tr>
<td>999</td>
<td>XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX</td>
<td>.9</td>
<td>99 XXX 99</td>
</tr>
</tbody>
</table>

1. This program will list only those modules that exist in the current program. Modules completed before a program change will be included in a 'STATUS' list.

EXAMPLE:

CURRENT PROGRAM
JOHNSON BIG J
123-45-6789
17-MAR-74

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>MODULE DESCRIPTION</th>
<th>CREDITS</th>
<th>STARTING DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>LINEAR MOTION AND TRAJECTORIES</td>
<td>.5</td>
<td>25 DEC 84</td>
</tr>
<tr>
<td>115</td>
<td>VECTORS AND FORCES</td>
<td>.4</td>
<td>15 JAN 85</td>
</tr>
</tbody>
</table>
I000 ON ERROR G0 T0 6000
1010 OPEN "MP" FOR INPUT AS FILE 9, M0DE 1
1020 INPUT #9, N1$, N3$
1030 CLOSE 9
1040 OPEN N3$ FOR INPUT AS FILE 1, M0DE 1
1050 DIM #1, P(20), D(20), S(30), D1(30), D2(30), C1(30),
L(2), E(30), T(1, 120)
1060 IF P(0).0 THEN 1080
1070 PRINT "NO PROGRAM EXIST F0R N"; N1$: G0 T0 9990
1080 PRINT: PRINT: PRINT "CURRENT PROGRAM"
1090 PRINT NI$: PRINT DATES(0): PRINT
1100 PRINT "NUMBER"; TAB(16); "MODULE DESCRIPTION"; TAB(43);"SIZE STARTING DATE"; PRINT
1110 OPEN "MODULE" FOR INPUT AS FILE 2, M0DE 1
1120 DIM #2, M(40), M1(40)=8, M2(40)=32, C2(40),
D3(40,1), R(40,3), K(40,10)
1130 FOR K=1 TO P(0)
1140 FOR L=1 TO M(K)
1150 IF M(L)=P(K) THEN 1190
1160 NEXT L
1170 PRINT TAB(2) P(K); "DOES NOT EXIST IN FILE"
1180 G0 T0 1210
1190 G0SUB 7000
1200 PRINT TAB(1); P(K); TAB(9); M(L); TAB(45); C2(L); TAB(54);
Y2Z; MID(X2S, Z-3, 3); Y1Z
1210 NEXT K: PRINT: PRINT: PRINT:
CLOSE 2: G0 T0 9990
6000 IF ERR<.19 THEN ON ERROR G0 T0 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1$="JANFEBMARAPRMAIPUMARJULAOUGSEPCTNDJAN" 
7010 X2$="000010590901201511821224327304634"
7030 Y2%=D( K): Y1%=Y2%-1)/365+74
7040 IF Y2%<366 THEN 7060
7050 Y2%=Y2%-365: G0 T0 7040
7060 FOR Z=1 TO 39 STEP 3
7070 IF Y2%=VAL(MID(X2Z, Z, 3)) THEN 7090
7080 NEXT Z
7090 Y2%=Y2%-VAL(MID(X2S, Z-3, 3))
8000 RETURN
9990 CLOSE 1: CHAIN "MAINST"
9999 END

READY
1000 ON ERROR GOTO 6000
1010 OPEN "TMP" FOR INPUT AS FILE 9, MODE 1
1020 INPUT #9, N1$ S1$ N3$
1030 CLOSE 9
1040 OPEN N3$ FOR INPUT AS FILE 1, MODE 1
1050 DIM #1, P%(20), D%(20), S%(30), D1%(30), D2%(30), Cl(30),
L%(2), EX(30), T%(1:120)
1060 PRINT: PRINT: PRINT
1070 PRINT "STATUS OF " N1$ TAB(34) N3$ DATES(N): PRINT
1080 IF S%(0) = 0 THEN 1100
1090 PRINT "HAS NOT YET STARTED A MODULE"; GOTO 9990
1100 PRINT "MODULE STARTED FINISHED LEVEL SIZE"; PRINT
1110 FOR K = 1 TO 5%0)
1120 X1 = D1%(K)
1130 GOSUB 7000
1140 Z1 = Y2% Z2$ = MID(X1$, Z - 3, 3) Z3 = Y1%
1150 IF D2%(K) > 0 THEN 1180
1160 PRINT TAB(1); S%(K); TAB(6); Z1; Z2$; Z3
1170 G0 TO 1230
1180 X1 = D2%(K)
1190 GOSUB 7000
1200 Z4 = Y2% Z5$ = MID(X1$, Z - 3, 3) Z6 = Y1%
1210 Z7% = INT(C1(K))
1215 Z8 = INT((C1(K) - Z7%) * 10 + .5) / 10
1220 PRINT TAB(11); S%(K); TAB(6); Z1; Z2$; Z3; TAB(19); Z4; Z5$; Z6; TAB(31); Z7%; TAB(38); Z8
1230 NEXT K; PRINT: PRINT: PRINT: G0 TO 9990
6000 IF ERR $ = 19 THEN ON ERROR G0 TO 0
6010 PRINT "WAITING"; SLEEP 5
6020 RESUME
7000 X1$ = "JAN FEBMARAPR MAYJUN JUL AUSEP OCTNOV DEC"
7010 X2$ = "000231059090120151181212243273304334"
7030 Y2% = X8%: Y1% = (Y2% - 1) / 365 + 74
7040 IF Y2% < 366 THEN 7060
7050 Y2% = Y2% - 365: G0 TO 7040
7060 FOR Z = 1 TO 39 STEP 3
7070 IF Y2% <= VAL(MID(X2$, Z, 3)) THEN 7090
7080 NEXT Z
7090 Y2% = Y2% - VAL(MID(X2$, Z - 3, 3))
8000 RETURN
9990 CLOSE 1: CHAIN "MAINST"
9999 END

READY
1000 ON ERROR, GO TO 6000
1010 OPEN "TMP" FOR INPUT AS FILE 9, MODE 1
1020 INPUT #9, N1$,
1030 CLOSE 9
1040 OPEN N3$ FOR INPUT AS FILE 1, MODE 1
1050 DIM #1, P2(20), D5(20), S1(30), D1(30), C1(30),
     L1(2), E1(30), T1(1,120)
1060 C7=P(0); C8=S(0)
1070 IF C7>0 THEN 1100
1080 PRINT "SORRY - NO PROGRAM EXISTS FOR "# N1$
1090 G0 TO 9990
1100 IF C8<>0 THEN 1120
1110 K=0: GO TO 1210
1120 IF D2(C8)=0 THEN 1230
1130 IF P(C7)<S(C8) THEN 1170
1140 PRINT "SORRY - YOUR PROGRAM IS COMPLETED. YOU MUST"
1150 PRINT "ENTER A PROGRAM ADDITION BEFORE CONTINUING."
1160 G0 TO 9990
1170 FOR K=1 TO C7
1180 IF P(K)=S(C8) THEN 1210
1190 NEXT K
1200 PRINT "ERROR IN ENTRY AT 1200": GO TO 9990
1210 W=0; C8=C8+1; S(0)=C8
1220 S(0)=P(K)+1; D2(C8)=0; G0 TO 1235
1230 W=1
1235 M=S(C8)
1240 G0SUB 5000
1250 G0SUB 7000
1260 IF X8<=M7 THEN 1278
1270 PRINT "MODULE #"; M4; "IS NO LONGER AVAILABLE": G0 TO 9990
1274 IF W=1 THEN 1280
1278 D1(C8)=X8$; C1(C8)=M9
1280 C9=0
1285 DIM S1(10)
1290 IF M8(0)=0 THEN 1350
1300 FOR K1=1 TO M8(0)
1310 FOR K2=1 TO E1(0)
1320 IF M8(K1)=E1(K2) THEN 1340
1330 NEXT K2: C9=C9+1; S1(C9)=M8(K1)
1340 NEXT K1
1350 IF C9=0 THEN 8000
1360 PRINT; PRINT; PRINT
1370 PRINT "PRETEST ITEMS FOR"
1380 PRINT "MODULE #"; M4; M6$: PRINT

READY
1000 ON ERROR GO TO 6000
1010 OPEN "TMP" FOR INPUT AS FILE 9, MODE 1
1020 INPUT #9, NS, S1, S2, M%, MIS, MS
1030 CLOSE 9
1040 OPEN MIS FOR INPUT AS FILE 2, MODE 1
1050 DIM #2, A%(50), S1%(50), S2%(50), AS%(50)=64
1060 DIM A8%(50), S8%(50), S92(50), A8S(50)=64
1065 DIM X(50)
1070 N=A%(0)
1080 FOR J=1 TO N
1090 A8%(J)= A%(J)
1100 S8%(J)=S1%(J)
1110 S92(J)=S22(J)
1120 A8S(J)= AS(J)
1130 NEXT J
1140 CLOSE 2
1150 FOR J=1 TO N
1160 X(J)=S1*S8%(J)+S2*S92(J)
1165 D=SQR((S1*S1+S8%(J)+2)*(S2*S2+S92(J)+2))
1167 IF D=0 THEN D=1000
1170 X(J)=X(J)/D
1180 NEXT J
1190 PRINT: PRINT: PRINT
1200 PRINT "LEARNING ACTIVITIES PRESCRIPTION FOR: "; NS
1205 PRINT S1; S2
1210 PRINT "MODULE "; M%; MS; " "; DATES(0): PRINT
1215 PRINT "OBJ ", "ACTIVITY"
1220 K=1: J=J+1
1230 IF INT(A8%(K+1)/10)<A8%(K)/10 THEN 1300
1240 K=K+1
1250 GO TO 1230
1300 FOR J=K TO N
1310 FOR L1=J TO K-1
1320 FOR L2=L1+1 TO K
1330 IF X(L2)<X(L1) THEN 1370
1340 A8%(0)=A8%(L2): A8%(L2)=X(L2) X(0)=X(L2)
1350 A8%(L2)=A8%(L1): A8%(L1)=X(L1) X(L2)=X(L1)
1360 A8%(L1)=A8%(0): A8%(0)=X(L1) X(L1)=X(0)
1370 NEXT L2
1380 NEXT L1
1400 PRINT INT(A8%(J)/10)
1410 FOR L=J TO K
1420 PRINT " "; A8%(L)-10*INT(A8%(L)/10); A8%(L); 1430 NEXT L
1440 IF K>=N THEN 9990
1450 K=K+1: J=J+1 GO TO 1230
6000 IF ERR<19 THEN ON ERROR GO TO 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
9990 PRINT: PRINT: PRINT: CHAIN "MAINST"
9999 END

READY
1390 OPEN "SKLFIL" FOR INPUT AS FILE 3, MODE 1
1400 DIM #3, F$(30), FS$(30)=64
1410 FOR K1=1 TO 9
1420 FOR K2=1 TO F$(0)
1430 IF S$(K1) = F$(K2) THEN 1460
1440 NEXT K2
1450 PRINT S$(K1); G0 TO 1470
1460 PRINT S$(K1); FS$(K2)
1470 NEXT K1: CLOSE 3: PRINT: PRINT
1490 GO TO 9990
5000 OPEN "MODULE" FOR INPUT AS FILE 2, MODE 1
5005 DIM #2, M$(40), M1$(40)=8, M2$(40)=32, C2(40),
R2$(40, 3), K2(40, 10)
5010 DIM M$(10)
5015 FOR J=1 TO M$(0)
5020 IF M = M$(J) THEN 5030
5025 NEXT J: PRINT "MOD "; J; M " IS MISSING": CLOSE 2: G0 TO 9990
5035 FOR K=0 TO 10: M8(K)=K(J,K): NEXT K
5040 CLOSE 2
5050 RETURN
6000 IF ERR>19 THEN ON ERROR GO TO 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1$="JANFEBMARAPRILMAYJUNJUL AUGSEPÖCTNOVDEC"
7010 X2$="000301090120151181212243273304334"
7020 X3$="000036507301095"
7030 CHANGE MID(DATES$(0), 4, 3) TO X4%
7034 X4%(2)=X4%(2)-32: X4%(3)=X4%(3)-32
7036 CHANGE X4% TO X4$
7038 X5=INSTR(1, X1%, X4$)
7040 X6=VAL(MID(DATES$(0), 1, 2)) + X7=VAL(MID(DATES$(0), 8, 2))
7050 X6=VAL(MID(X2$, X5%, 3)) + VAL(MID(X3$, (X7%=73)*4-3, 4)) + X6%
7060 RETURN
8000 OPEN "TMP" AS FILE 8
8010 PRINT #8, N1$", "L$(1)", "L$(2)", "M4$", "M5$", "M6$
8020 CLOSE 1, 8
8030 PRINT "WAIT": CHAIN "PSGPTN"
9990 CLOSE 1: CHAIN "MAINST"
9999 END

READY
1000 ON ERROR G0 TO 6000
1540 INPUT "NAME TO BE DROPPED"; N16
1560 L=LEN(N16)
1570 OPEN "STUDENT" FOR INPUT AS FILE 1, MODE 1
1580 DIM #1, N$(400, 2)
1590 N=VAL(N$(0, 0))
1600 FOR J=1 TO N
1610 IF LEFT(N$(J, L)=LEFT(N$(J+1, L) THEN 1710
1620 NEXT J
1630 PRINT "CAN'T FIND NAME"
1650 G0 TO 9990"
1710 IF LEFT(N$(J, L))<>LEFT(N$(J+1, L) THEN 1800
1730 PRINT "THE NAME YOU ENTERED IS EQUAL TO BOTH OF THE FOLLOWING."
1740 PRINT N$(J, 0); PRINT N$(J+1, 0); PRINT "TRY AGAIN"
1760 CLOSE 1
1770 G0 TO 1540
1800 PRINT "CONFIRM "N$(J, 0); ""N$(J+1, 0)"
1810 INPUT "TYPE Y OR N"; N99
1820 IF N99="Y" THEN 9990
1830 FS=N$(J, 2)
1840 FOR J1=J TO N
1850 N$(J1, 0)=N$(J1+1, 0)
1860 N$(J1, 1)=N$(J1+1, 1)
1870 N$(J1, 2)=N$(J1+1, 2)
1880 NEXT J1
1890 KILL FS
1895 N$(0, 0)=N$(N, N-1)
1900 G0 TO 9990
6000 IF ERR<>19 THEN G0 TO 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
9990 CLOSE 1
9999 END
Program: EXPUSE

EXPECTED MODULE ENTRY
- BY DATE -

<table>
<thead>
<tr>
<th>DATE</th>
<th>MODULE (NBR OF STUDENTS)</th>
<th>NBR OF STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>99 XXX 99</td>
<td>999 (999)</td>
<td>999 (999)</td>
</tr>
<tr>
<td>99 XXX 99</td>
<td>999 (999)</td>
<td>999 (999)</td>
</tr>
<tr>
<td>99 XXX 99</td>
<td>999 (999)</td>
<td>999 (999)</td>
</tr>
</tbody>
</table>

1. The dates are uniformly incremented in chronological order - possibly every Monday or every Monday and Wed.

2. The Mod(nbr of students) are listed from left to right in decreasing nbr of students.

EXAMPLE:

<table>
<thead>
<tr>
<th>DATE</th>
<th>MODULE (NBR OF STUDENTS)</th>
<th>NBR OF STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 JAN 74</td>
<td>111 (52)</td>
<td>301 (25)</td>
</tr>
<tr>
<td>2 FEB 74</td>
<td>301 (70)</td>
<td>112 (32)</td>
</tr>
<tr>
<td>9 FEB 74</td>
<td>120 (35)</td>
<td>111 (14)</td>
</tr>
</tbody>
</table>

MEANS:
- 52 Students plan to start module 111 on or about Jan 25
- 25 Students plan to start module 301 on or about Jan 25
- 5 Students plan to start module 301 on or about Feb 9

etc.

F-12
54
1000 \texttt{ON \ ERROR \ GO \ TO \ 6000}
1010 \texttt{DIM A%(20,20)}
1020 \texttt{MAT A%=ZERO}
1030 \texttt{PRINT "ENTER MONTH(XXX) AND DAY(99) YOU WANT REPORT TO START"}
1040 \texttt{INPUT X4 S, X6 Z}
1045 \texttt{X9 S="JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC"}
1050 \texttt{X5 S=INSTR(1,X9 S,LEFT(X4 S,3))}
1055 \texttt{X7 S=VAL(MID(DATETIME(0),8,2))}
1060 \texttt{X6 Z=VAL(MID(X3 S,(X7 S-73)*4-3,4))+X6 Z}
1070 \texttt{X8 S=X9 S=X5 S=X6 Z}
1080 \texttt{OPEN "STUDENT" FOR INPUT AS FILE 1, M\O\DE 1}
1090 \texttt{DIM #1, N$(400,2)}
1100 \texttt{N=VAL(N$(0,0))}
1110 \texttt{FOR J=1 TO N}
1120 \texttt{OPEN "NOTE" FOR INPUT AS FILE 2, M\O\DE 1}
1130 \texttt{DIM PZ(0), DZ(20), SU(30), D1 D(30), D2 D(30), C1(30), L%(2), E%(30), T%(1,120)}
1140 \texttt{IF PZ(0)=0 THEN 1370}
1150 \texttt{FOR K=1 TO PZ(0)}
1160 \texttt{IF DZ(K)<AZ(1,0) OR DZ(K)>=AZ(20,0) THEN 1360}
1170 \texttt{FOR L=1 TO 20}
1180 \texttt{IF DE(K)<AZ(L,0) THEN 1280}
1190 \texttt{PRINT "ERROR AT LINE 1270"; G\S TO 1360}
1200 \texttt{M=L-1}
1210 \texttt{IF M>AZ(0,0) THEN AZ(0,0)=M}
1220 \texttt{C=-1}
1230 \texttt{C=C+2}
1240 \texttt{IF C>=20 THEN 1360}
1250 \texttt{IF AZ(M,C)=0 THEN AZ(M,C)=PZ(K)}
1260 \texttt{IF PZ(K)<AZ(M,C) THEN 1310}
1270 \texttt{AZ(M,C+1)=AZ(M,C)+1}
1280 \texttt{NEXT K}
1290 \texttt{CLOSE 2}
1300 \texttt{NEXT J}
1310 \texttt{CLOSE 1}
1320 \texttt{FOR J=1 TO AZ(0,0)}
1330 \texttt{FOR K=1 TO 18 \STEP 2}
1340 \texttt{FOR K=1+2 TO 20 \STEP 2}
1350 \texttt{IF AZ(J,K2)<AZ(J,K1) THEN 1470}
1360 \texttt{S1=AZ(J,K1) S2=AZ(J,K1-1)}
1370 \texttt{AZ(J,K1-1)=AZ(J,K2-1)}
1380 \texttt{AZ(J,K2)=S1 A AZ(J,K2-1)=S2}
1390 \texttt{NEXT K}
1400 \texttt{NEXT J}
1410 \texttt{PRINT; PRINT; PRINT}

\texttt{READY}
1510 PRINT TAB(20); "EXPECTED MODULE ENTRY"
1520 PRINT TAB(23); "- BY DATE -": PRINT
1530 PRINT " DATE  - - - MODULE(NBR OF STUDENTS) - - -"
1540 PRINT
1600 FOR J=1 TO AZ(0,0)
1610 X8=A%(J,0)
1620 GOSUB 7000
1630 Z1=Y2%: Z2S=MID(X1S,Z-3,3): Z3=Y1%
1640 FOR K=1 TO 7 STEP 2
1650 IF A%(J,K)=0 THEN 1670
1660 NEXT K
1670 K=INT(K-1)/2
1680 A1S=NUMS(A%(J,1))+("+"+NUMS(A%(J,2))+)"
1690 A2S=NUMS(A%(J,3))+("+"+NUMS(A%(J,4))+)"
1700 A3S=NUMS(A%(J,5))+("+"+NUMS(A%(J,6))+)"
1710 A4S=NUMS(A%(J,7))+("+"+NUMS(A%(J,8))+)
1720 IF K=0 THEN 1740
1730 ON K GO TO 1760, 1780, 1800, 1820
1740 PRINTZ1; Z2S; Z3
1750 GO TO 1830
1760 PRINTZ1; Z2S; Z3; TAB(15);A1S
1770 G0 T0 1830
1780 PRINTZ1; Z2S; Z3; TAB(15);A1S; TAB(28);A2S
1790 G0 T0 1830
1800 PRINTZ1; Z2S; Z3; TAB(15);A1S; TAB(28);A2S; TAB(41);A3S
1810 G0 T0 1830
1820 PRINTZ1; Z2S; Z3; TAB(15);A1S; TAB(28);A2S; TAB(41);A3S; TAB(54);A4S
1830 NEXT J
1840 G0 T0 9999
6000 IF ERR<>19 THEN ON ERROR GO TO 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1S="JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC"
7010 X2S="0000310590901261511812243273304334"
7030 Y2%=X8%: Y1%=Y2%/365+74
7040 IF Y2%<366 THEN 7060
7050 Y2%=Y2%-365: G0 T0 7040
7060 FOR Z=1 TO 39 STEP 3
7070 IF Y2%<=VAL(MID(X2S,Z-3)) THEN 7090
7080 NEXT Z
7090 Y2%=Y2%-VAL(MID(X2S,Z-3))
8000 RETURN
9999 END
1000 \textbf{ERRNR} G0 T0 6000
1010 PRINT "TO ENTER A NEW MODULE TYPE (NEW)"
1020 PRINT "TO DELETE AN OLD MODULE TYPE (DELETE)"
1030 INPUT "OTHERWIZE (EXIT)"; \textbf{RS}
1040 IF \textbf{RS}="DELETE" THEN 1600
1050 IF \textbf{RS}="NEW" THEN 1070
1060 G0 T0 9990
1070 INPUT "NEW MODULE NUMBER ="; \textbf{MI}
1080 OPEN "MODULE" FOR INPUT AS \textbf{FILE} 2, \textbf{MODE} 1
1090 DIM 40, M$(40); M$(40)=8, M$(40)=32, C2(40),
D3(40,1), R(40,3), \textbf{K}(40,10)
1100 \textbf{M}=M$(0)
1110 FOR \textbf{J}=1 TO \textbf{M}
1120 IF M$(J) THEN 1200
1130 IF M$(J)<M$(0) THEN 1170
1140 CLOSE 2
1150 PRINT "SORRY - BUT THAT MODULE ALREADY EXISTS."
1160 G0 T0 9990
1170 NEXT \textbf{J}
1180 \textbf{JI}=\textbf{M}+1
1190 G0 T0 1290
1200 PRINT "WAIT"
1210 FOR \textbf{J}=1 TO \textbf{J} STEP -1
1220 FOR \textbf{K}=0 TO K2(J+1,0)
1230 IF M$(J)=0 THEN 1300
1240 FOR \textbf{K}=0 TO K2(J,0)
1250 \textbf{K}(J+1, K)=K2(J,K): NEXT \textbf{K}
1260 FOR \textbf{K}=0 TO 112(J)
1280 NEXT \textbf{J}
1290 \textbf{M}$(JI)=\textbf{M}
1300 INPUT "MODULE NAME IS"; \textbf{M}$(J)
1310 INPUT "MODULE SIZE IS"; C2(J)
1320 INPUT "HOW MANY PREREQUISITE MODULES"; \textbf{C9}
1330 IF \textbf{C9}=0 THEN 1380
1340 IF \textbf{C9}=3 THEN 1360
1350 PRINT "LIMIT OF THREE - TRY AGAIN"; G0 T0 1320
1360 FOR \textbf{K}=1 TO \textbf{C9}; INPUT "PREREQ NBR IS"; R(\textbf{J}, \textbf{K})
1370 NEXT \textbf{K}
1380 R(\textbf{J}, 0)=\textbf{C9}
1390 INPUT "HOW MANY PRETEST ITEMS"; \textbf{C9}
1400 IF \textbf{C9}=0 THEN 1460
1410 IF \textbf{C9}=10 THEN 1430
1420 PRINT "LIMIT OF TEN - TRY AGAIN"; G0 T0 1390
1430 FOR \textbf{K}=1 TO \textbf{C9}
1440 INPUT "PRETEST NUMBER IS"; K2(J, K)
1450 NEXT \textbf{K}

\textbf{READY}
1460 K%(J1,0)=C9
1470 PRINT "ENTER DATE THIS MODULE WILL FIRST BECOME AVAILABLE:"
1480 GOSUB 7000
1490 D3%(J1,0)=X8%
1500 INPUT "HOW MANY DAYS WILL THIS MODULE BE AVAILABLE?": X8%
1510 D3%(J1,1)=D3%(J1,0)+X8%
1530 C9$="XMD"+NUM$(M1)
1540 OPEN C9$ AS FILE 4
1550 DIM A%(50), SI%(50), S2%(50), AS(50)=64
1560 A%(0)=0: AS(50)=""
1570 CLOSE 4
1580 M1%(J1)=C9$
1585 M%(0)=M%(0)+1
1590 CLOSE 2: G0 TO 9990
1600 INPUT "MODULE TO BE DELETED IS": M1
1610 OPEN "MODULE" FOR INPUT AS FILE 2, MODE 1
1615 M=M%(0)
1620 FOR J=1 TO M
1630 IF M1=M%(J) THEN 1670
1650 PRINT "THAT MODULE DOES NOT EXIST"
1660 CLOSE 2: G0 TO 9990
1670 KILL M1%(J)
1675 FOR J=J TO M
1680 FOR K=0 TO K%(J1,0) : K%(J1,K)=K%(J1+1,K): NEXT K
1690 FOR K=0 TO K%(J1,0) : R%(J1,K)=R%(J1+1,K): NEXT K
1700 D3%(J1,0)=D3%(J1+1,0): D3%(J1,1)=D3%(J1+1,1)
1710 C2%(J1)=C2%(J1+1): M%(J1)=M%(J1+1)
1720 M1%(J1)=M1%(J1+1): M%(J1)=M%(J1+1)
1730 NEXT J1
1740 M%(0)=M%(0)-1
1745 CLOSE 2
1750 PRINT "THAT MODULE #": M1: "HAS BEEN DELETED": G0 TO 9990
6000 IF ERR<=19 THEN ON ERROR G0 TO 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1$="JANFEBMARAPRMayJUNJULAOUGSEPOTN0VDECM"
7010 X2$="000003105909012015181212243273304334"
7020 X3$="0000036507301095"
7030 INPUT "MONTH-XXX": X4$: X5%=INSTR(1,X1$,LEFT(X4$,3))
7040 INPUT "DAY": X6$: X7%=VAL(MID(DATES(0),8,2))
7050 X8%=VAL(MID(X2$,X5%,3))+VAL(MID(X3$,X7‰73*4-3,4))+X6%
7060 RETURN
9990 END

READY
1000 ON ERROR GOTO 6000
1010 PRINT: PRINT: PRINT
1020 PRINT TAB(11); "MODULE SUMMARY - " ; DATES(0): PRINT
1030 PRINT "NBR";TAB(16); "NAME";TAB(40); "SIZE AVAILABLE DAYS"
1040 PRINT
1050 OPEN "MODULE" FOR INPUT AS FILE 2, MODE 1
1060 DIM #2, M(40), M$(40) = 8, M$(40) = 32, C2(40),
     D3%(40, 1), R%(40, 3), K%(40, 10)
1070 FOR J = 1 TO M(0)
1080 D% = D3%(J, 1) - D3%(J, 0)
1090 X8% = D3%(J, 0)
1100 GOSUB 7000
1110 Z1 = Y2%: Z2% = MID(X1%, Z - 3, 3): Z3 = Y1%
1120 PRINT M$(J); M$(J); TAB(41); C2(J); TAB(46); Z1; Z2; Z3: TAB(58); D%
1130 IF R%(J, 0) = 0 THEN 1160
1140 PRINT TAB(8); "Q = "
1150 PRINT R%(J, K): FOR K = 1 TO R%(J, 0): PRINT
1160 IF K%(J, 0) = 0 THEN 1190
1170 PRINT TAB(8); "P = "
1180 PRINT K%(J, K): FOR K = 1 TO K%(J, 0): PRINT
1190 PRINT
1200 NEXT J
1210 GOSUB 9990
6000 IF ERR<>19 THEN ON ERROR GOTO 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1% = "JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC"
7010 X2% = "0000310590901201511812243273304334"
7030 Y2% = X8%; Y1% = (Y2% - 1) / 365 + 74
7040 IF Y2% < 366 THEN 7060
7050 Y2% = Y2% - 365: GOTO 7040
7060 FOR Z = 1 TO 39 STEP 3
7070 IF Y2% <= VAL(MID(X2%, Z, 3)) THEN 7090
7080 NEXT Z
7090 Y2% = Y2% - VAL(MID(X2%, Z - 3, 3))
8000 RETURN
9990 CLOSE 2
9999 END

READY
MODUDP 02:24 PM 18-JUN-74
1000 ON ERROR GOTO 6000
1010 INPUT "MODULE NUMBER" M
1020 OPEN "XMD"+NUMS(M) FOR INPUT AS FILE 2, MODE 1
1030 DIM #2, A%(50), S1%(50), S2%(50), AS%(50) = 64
1040 N=A%(0)
1050 PRINT "To add or replace an activity - enter the activity number"
1055 PRINT "number and follow inst for styles & description."
1060 PRINT "Negative activity number deletes an activity."
1070 PRINT "Zero activity number terminates update."
1090 PRINT "NBR"; A
1100 IF A=0 THEN 1530
1110 IF A<0 THEN 1400
1130 FOR J1=1 TO N
1140 IF A=A%(J1) THEN 1270
1150 NEXT J1
1160 FOR J=1 TO N
1170 IF A<A%(J) THEN 1210
1180 NEXT J
1190 J1=N+1
1200 GO TO 1265
1210 FOR J1=N TO J STEP -1
1220 AS%(J1+1)= AS%(J1); A%(J1+1)=A%(J1)
1240 S2%(J1+1)=S2%(J1); S1%(J1+1)=S1%(J1)
1260 NEXT J1
1265 A%(0)=A%(0)+1: N=N+1
1270 A%(J1)=A
1280 INPUT "STY-1"; S1%(J1)
1290 INPUT "STY-2"; S2%(J1)
1300 PRINT "DESCRIPTION"
1305 INPUT LINE SS
1310 IF SS="" THEN 1090
1320 AS%(J1)=SS
1330 G0 TO 1090
1400 A=-1*A
1410 IF N=0 THEN 1090
1420 FOR J=1 TO N
1430 IF A=A%(J) THEN 1450
1440 NEXT J: GO TO 1090
1450 FOR J1=J TO N
1460 AS%(J1)= AS%(J1+1); A%(J1)= A%(J1+1)
1470 S2%(J1)=S2%(J1+1); S1%(J1)=S1%(J1+1)
1500 NEXT J1
1510 A%(0)=A%(0)-1: N=N-1
1520 G0 TO 1090
1530 INPUT "For a list of all activities type Y else N"; NS
1540 IF NS<>"Y" THEN 9990
1550 PRINT: PRINT: PRINT
1560 PRINT "Activities list for module #"; M: PRINT
1570 FOR J=1 TO N
1580 PRINT A%(J); AS%(J)
1590 PRINT TAB(8); "styles-"; S1%(J); S2%(J)
1600 NEXT J: PRINT: PRINT: PRINT: G0 TO 9990
9990 CLOSE 2
9999 END

READY 60
MODUSE 02:32 PM 18-JUN-74
1000 ON ERROR GO TO 6000
1010 OPEN "STUDNT" FOR INPUT AS FILE 1, MODE 1
1020 DIM #1, N$(400, 2)
1030 N=VAL(N$(0, 0))
1040 DIM N2$(400), N%(40, 3)
1050 FOR J=1 TO N: N2$(J)=N$(J, 2): NEXT J
1060 CLOSE 1
1070 OPEN "MODULE" FOR INPUT AS FILE 3, MODE 1
1080 DIM #3, M$(40), M1$(40)=5, M$(40)=32, C2$(40),
D3$(40, 1), R%(40, 3), K%(40, 10)
1090 M=M$(0)
1100 FOR J=1 TO M: N%(J, 0)=M%(J): NEXT J
1110 CLOSE 3
1120 MAT N%ZER
1130 FOR J=1 TO N
1140 OPEN N2$(J) FOR INPUT AS FILE 2, MODE 1
1150 DIM #2, P$(20), D$(20), S$(30), D1$(30), D2$(30), C1(30),
L$(2), E$(30), T%(1, 120)
1160 S=S$(0): P=P$(0)
1170 IF D2%(S)<0 THEN 1280
1180 FOR K=1 TO M
1190 IF S$(S)=N%(K, 0) THEN N%(K, 2)=N%(K, 2)+1
1200 NEXT K
1210 IF S<2 THEN 1310
1220 IF K=1 TO S-1
1230 IF K=1 TO M
1240 IF S%(K1)=N%(K, 0) THEN N%(K, 1)=N%(K, 1)+1
1250 NEXT K
1260 NEXT K1
1270 G0 TO 1310
1280 FOR K=1 TO M
1290 IF S$(S)=N%(K, 0) THEN N%(K, 1)=N%(K, 1)+1
1300 NEXT K
1310 IF P=0 THEN 1500
1320 IF S=0 THEN 1410
1330 FOR K=1 TO M
1340 IF S%(S)=P%(K) THEN 1360
1350 NEXT K
1360 IF K=P THEN 1500
1370 FOR L=1 TO M
1380 IF P%(K+1)=N%(L, 0) THEN N%(L, 3)=N%(L, 3)+1
1390 NEXT L
1400 G0 TO 1500
1410 FOR K=1 TO M
1420 IF P%(1)=N%(K, 0) THEN N%(K, 3)=N%(K, 3)+1
1430 NEXT K
1450 CLOSE 2
1460 NEXT J
1480 READY

F-19

61
1600 PRINT: PRINT: PRINT
1610 PRINT "CURRENT MODULE ACTIVITY = "; DATES(0)
1620 PRINT
1630 PRINT "MODULE STUDENTS STUDENTS STUDENTS"
1640 PRINT "NUMBER FINISHED ACTIVE EXPECTED"
1650 PRINT
1660 FOR J=1 TO M
1680 NEXT J
1690 G0 TO 9999
6000 IF ERR<>19 THEN ON ERROR G0 TO 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
9999 END

READY
1000 ON ERROR G0 TO 6000
1010 OPEN "STUDNT" FOR INPUT AS FILE 1, MODE 1
1020 DIM I, N$(400,2)
1030 N=VAL(N$(0,0))
1040 FOR J=1 TO N
1050 PRINT N$(J,0); TAB(16); N$(J,2)
1060 NEXT J
1070 CLOSE 1
1080 G0 TO 9999
6000 IF ERR<>19 THEN ON ERROR G0 TO 0
6010 PRINT "WAITING": SLEEP 5
6020 G0 TO J
9999 END

READY
1000 ON ERROR GO TO 6000
1010 PRINT: PRINT: PRINT
1020 PRINT "PROGRESS REPORT - " & DATES(0)
1030 PRINT
1040 PRINT "STUDENT MODULE STARTED FINISHED"
1050 PRINT
1060 OPEN "STUDENT" FOR INPUT AS FILE 1, MODE 1
1070 DIM #1, NS(400,2)
1080 N=VAL(NS(0,0))
1090 FOR J=1 TO N
1100 OPEN NS(J,2) FOR INPUT AS FILE 2, MODE 1
1110 DIM #2, P(20), D(20), S(30), D1(30), D2(30), C1(30), L(2), E(30), T(1,120)
1120 IF P(0)>0 THEN 1150
1130 PRINT J; NS(J,0)
1140 GO TO 1330
1150 IF S(0)>0 THEN 1180
1155 K=1
1160 PRINT J;NS(J,0);TAB(21);P(K)
1170 GO TO 1330
1180 K=S(0)
1190 IF D2(K)>0 THEN 1250
1200 X8=D1(K)
1210 GOSUB 7000
1220 Z1=Y2%; Z2$=MID(X1$,Z-3,3); Z3=Y1%
1230 PRINT J;NS(J,0);TAB(21);S(K);TAB(29);Z1;Z2$;Z3
1240 G0 T0 1330
1250 K=S(0)
1260 IF D2(K)>0 THEN 1250
1270 X8=D1(K)
1280 GOSUB 7000
1290 X8=D2(K)
1300 GOSUB 7000
1310 Z4=Y2%; Z5$=MID(X1$,Z-3,3); Z6=Y1%
1320 PRINT J;NS(J,0);TAB(21);S(K);TAB(29);Z1;Z2$;Z3,
1330 TAB(41);Z4;Z5$;Z6
1330 CLOSE 2
1340 NEXT J
1350 G0 T0 9990
6000 IF ERR<>19 THEN ON ERROR GO TO 0
6010 PRINT "WAITING": SLEEP 5
6020 RESUME
7000 X1$="JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC"
7010 X2$="00000105909012013181212243273304334"
7030 Y2%=X8%; Y1%=Y2%/(Y2%-1)/365+74
7040 IF Y2%<366 THEN 7060
7050 Y2%=Y2%-365: G0 T0 7040
7060 FOR Z=1 TO 39 STEP 3
7070 IF Y2%=VAL(MID(X2$,Z,3)) THEN 7090
7080 NEXT Z
7090 Y2%=Y2%-VAL(MID(X2$,Z-3,3))
8000 RETURN
9990 CLOSE 1
9999 END
1000 ON ERROR G0 TO 5000
1010 OPEN "SKLFIL" FOR INPUT AS FILE 3, MODE 1
1020 DIM #3, F%(30), FS(30)=64
1030 N=F%(0)
1040 PRINT "TO ENTER A NEW SKILL TYPE (NEW)"
1050 PRINT "TO DELETE AN OLD SKILL TYPE (DELETE)"
1060 INPUT "OTHERWISE (LIST)"; RS
1070 IF RS="DELETE" THEN 1310
1080 IF RS="NEW" THEN 1100
1090 G0 TO 4000
1100 INPUT "NEW SKILL NUMBER ="; NZ
1110 PRINT "CONFIRM"; NZ
1120 INPUT "TYPE Y OR N"; NS
1130 IF NS<>"Y" THEN 1100
1140 FOR J=1 TO N
1150 IF NZ=F%(J) THEN 1220
1160 IF NZ>F%(J) THEN 1190
1170 PRINT "SORRY - BUT THAT SKILL ALREADY EXISTS."
1180 G0 TO 9990
1190 NEXT J
1200 J1=N+1
1210 G0 TO 1250
1220 FOR J1=N TO J STEP -1
1230 FS(J1+1)=FS(J1); F%(J1+1)=F%(J1)
1240 NEXT J1
1250 F%(J1)=NZ
1260 PRINT "SKILL DESCRIPTION IS"
1265 INPUT FS(J1)
1270 N=N+1
1280 PRINT "TO ENTER ANOTHER SKILL TYPE Y ELSE N"; NS
1290 IF NS<>"Y" THEN 4000
1300 G0 TO 1100
1310 INPUT "SKILL NUMBER TO BE DELETED IS"; N
1320 PRINT "CONFIRM"; N
1330 INPUT "TYPE Y OR N"; NS
1340 FOR J=1 TO N
1350 IF NS=F%(J) THEN 1390
1360 NEXT J
1370 PRINT "SORRY - THAT SKILL DOES NOT EXIST"
1380 G0 TO 9990
1390 FOR J=N TO J1
1400 FS(J1)=FS(J1+1); F%(J)=F%(J1+1)
1410 NEXT J1
1420 N=N-1
1430 PRINT "SKILL # "; N; "HAS BEEN DELETED"
1440 INPUT "TO DELETE ANOTHER SKILL TYPE Y ELSE N"; NS
1450 IF NS="Y" THEN 1310
1460 PRINT "CURRENT LIST OF SKILLS": DATES(0); PRINT
1470 FOR J=1 TO N; PRINT F%(J); FS(J); NEXT J; PRINT: PRINT
1480 G0 TO 9990
1490 IF ERR<>19 THEN ON ERROR G0 TO 0
1500 PRINT "WAITING": SLEEP 10
1520 RESUME
9999 END
APPENDIX G

MODULE FORMAT

Information describing each module of instruction is to be organized according to the following form to be entered into the computer.

1. **NUMBER**
   
   This is any integer less than 30000 and will be used by the system to identify and order the modules.

2. **NAME**
   
   This is any phrase less than 33 characters in length used to name the module and will be used to describe the module on output lists.

3. **SIZE**
   
   This is any real number used to indicate the amount of material covered in the module. (possibly the percentage of credit the module is worth)

4. **PREREQUISITE MODULES**
   
   This is a list of not more than three module numbers of the modules considered prerequisite to this module. Entry modules or 'stand alone' modules would have no prerequisite modules.

5. **PRETEST NUMBERS**
   
   Mode A: This is a list of not more than ten integer numbers identifying the particular skills needed to perform the learning activities in this module. An activities prescription will be output upon demonstration of those skills.

   Mode B: This is a list of not more than ten integer numbers identifying those pretest items which test the objective(s) in this module. Satisfactory completion of those items on the pretest will permit bypassing this module for credit. (no activities prescription will be output)
6. DATE

7. DAYS

This is the availability of the module. Learning activities will not be available before this date and must be completed within the specified number of days.

8. OBJECTIVE(S)

The objective(s) text will not be entered in the computer but will be given to all students in a printed study guide. There is no limit to the number of objectives for each module.

9. LEARNING ACTIVITIES

The learning activities (maximum of 50) are designed to provide various modes of instruction and are keyed to the objective(s) and briefly described as follows:

NUMBER

This is a 2 or more digit number in which the left hand digits are the same as the objective it references.

STYLE 1

STYLE 2

The style numbers are integers relating this activity to particular learning styles. (see special instructions for determining these numbers)

ACTIVITY

This is any sentence less than 65 characters in length which states the activity to be performed.
<table>
<thead>
<tr>
<th>NBR</th>
<th>Module</th>
<th>SIZE</th>
<th>PREQ MOD</th>
<th>PRETEST ITEMS</th>
<th>AVAILABLE DATE</th>
<th>DAYS</th>
</tr>
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<td>105</td>
<td>Metric Measurement &amp; Data Analyse</td>
<td>.2</td>
<td>none</td>
<td>210, 221</td>
<td>Aug. 26</td>
<td>14</td>
</tr>
<tr>
<td>110</td>
<td>Linear Motion &amp; Trajectories</td>
<td>.5</td>
<td>none</td>
<td>210, 221, 222, 224</td>
<td>Aug. 26</td>
<td>21</td>
</tr>
<tr>
<td>115</td>
<td>Vectors and Forces</td>
<td>.4</td>
<td>none</td>
<td>210, 221, 222, 224</td>
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<td>21</td>
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<td>.4</td>
<td>110, 115</td>
<td></td>
<td>Sept. 2</td>
<td>21</td>
</tr>
<tr>
<td>125</td>
<td>Energy and Momentum</td>
<td>.6</td>
<td>120</td>
<td></td>
<td>Sept. 9</td>
<td>21</td>
</tr>
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<td>125, 150</td>
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<td>Potential, Current &amp; Power</td>
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<td>160</td>
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<td>Oct. 14</td>
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<td>170</td>
<td>Electromagnetism &amp; EMF</td>
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<td>185</td>
<td>A.C.</td>
<td>.3</td>
<td>170</td>
<td></td>
<td>Nov. 11</td>
<td>28</td>
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</tbody>
</table>
Module #125 Energy and Momentum

OBJECTIVES:

1. State or identify a precise definition of potential energy. The concept of 'work' as defined in physics is to be used in that definition. Also identify (kg m²/sec²), (nt m) and (joules) as equivalent MKS units for potential energy.

2. Given the description of an object moving in a given force field, state whether the potential energy of that object is increasing, decreasing or remaining unchanged.

3. Calculate the change in potential energy of a body which is displaced from one point to another in the earth's gravitational force field. (At the surface of the earth, the earth's field exerts a force of 9.8 nt toward the center of the earth's on each kilogram of mass.)

4. Given information concerning the properties of a spring (how much force is required to compress that spring a given distance), construct a graph of force versus compression and determine the potential energy of the spring when it is compressed a given distance.

5. State or identify a precise definition of kinetic energy. Also state or identify the precise functional relationship between the kinetic energy and the velocity of an object.

6. Apply the principle of conservation of energy to calculate each of the following:
   a) the speed an object has after falling from a given height.
   b) the speed an object has after being fired from a spring gun

In each case you will be given the mass of the object, the geometric dimensions of the system and enough information to fully define the force.

7. Given a description of a frictionless system such as a roller coaster, car coasting on a hill or a cyclist on a loop-the-loop:
apply the principle of conservation of energy to predict maximum heights and/or velocities of the object when given the initial total energy of the object.

8. State or identify a definition of 'power', and recognize the units (joules/sec) and (watts) as equivalent MKS units of power.

9. Given the power output of some device, calculate how high that device can lift an object in a given time.

10. State or select a written definition of momentum and state or select a correct phrase describing the functional relationship between momentum and velocity. Also identify (kg m/sec) as correct MKS units for momentum.

11. Given a description of an explosion type system (rifle recoil and buttet) or a simple inelastic collision type system (bullet hits block of wood); use the principle of conservation of momentum to find an unknown mass of velocity when given all other masses and velocities.

12. State or select a definition of impulse and show how Newton's second law of motion (F = ma) implies that the impulse (FΔt) imparted to an object is equivalent to the change in momentum (mΔv) of that object.

13. Find the impulse imparted to an object when given a graph of the force applied to the object as a function of the time it was applied.

14. Find the average force involved in firing a projectile at a given speed when given the mass of the projectile and the time during which the force acts.

15. Find the average force involved in firing a projectile a given distance. Information to be given will include the geometric dimensions of the device, the angle of elevation and the mass of the projectile. (Evaluation of this objective will include questions concerning all steps of the solution.)
<table>
<thead>
<tr>
<th>NBR</th>
<th>STYLES</th>
<th>DESCRIPTION</th>
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<tr>
<td>011</td>
<td>(36,35)</td>
<td>Taped Minilecture: &quot;PE-Qualitative Discussion&quot;</td>
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<td>012</td>
<td>(37,31)</td>
<td>Supplemental Read: PSSC-p 300 sec 17-1, 17-2</td>
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<td>013</td>
<td>(35,32)</td>
<td>Textbook Reading: p 80 sec 7.1-7.2, p 84 sec 7.5</td>
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<tr>
<td>021</td>
<td>(36,31)</td>
<td>Supplemental Read: Freeman-p 199 sec. 9.5-9.6</td>
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<td>031</td>
<td>(38,35)</td>
<td>Tape Guided Lesson: &quot;PE-Quantitative Analysis&quot;</td>
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<td>032</td>
<td>(35,32)</td>
<td>Textbook Reading: p 83 sec 7.5</td>
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<td>033</td>
<td>(37,34)</td>
<td>Textbook Problems: p 93 #27, 28</td>
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<td>041</td>
<td>(36,31)</td>
<td>Supplemental Read: PSSC- p 320 sec 18-1</td>
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<td>(37,35)</td>
<td>Taped Minilecture: &quot;KE and Newton's Law&quot;</td>
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<td>(38,34)</td>
<td>Film Loop: &quot;Conversation of Energy&quot;</td>
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<td>Textbook Problems: p 93 #26, 27, 28</td>
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<td>071</td>
<td>(40,32)</td>
<td>Narrated Demonstr: &quot;The Roller Coaster&quot;</td>
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<tr>
<td>081</td>
<td>(36,31)</td>
<td>Supplemental Read: Freeman-p 209 sec 9.13</td>
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<td>082</td>
<td>(37,32)</td>
<td>Textbook Reading: p 81 sec 7.3</td>
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<tr>
<td>091</td>
<td>(35,34)</td>
<td>Textbook Problems: p 93 #32</td>
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<tr>
<td>101</td>
<td>(36,32)</td>
<td>Textbook Reading: p 95 sec 8.1</td>
</tr>
<tr>
<td>111</td>
<td>(39,35)</td>
<td>Narrated Lab Act: &quot;Muzzle Velocity of a Rifle&quot;</td>
</tr>
<tr>
<td>112</td>
<td>(40,34)</td>
<td>Demonstration: &quot;Recoil Velocity&quot;</td>
</tr>
<tr>
<td>113</td>
<td>(36,32)</td>
<td>Textbook Reading: p 96 sec 8.2, 8.6</td>
</tr>
<tr>
<td>114</td>
<td>(37,34)</td>
<td>Textbook Problems: p 105 #4, 5, 19, 20</td>
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<td>141</td>
<td>(37,32)</td>
<td>Textbook Reading: top p 96</td>
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<tr>
<td>142</td>
<td>(37,34)</td>
<td>Textbook Problem: p 105 #6, 7</td>
</tr>
<tr>
<td>151</td>
<td>(35,35)</td>
<td>Taped Minilecture: &quot;Forces to Propel Projectiles&quot;</td>
</tr>
</tbody>
</table>

Note: The first two digits of the activity number correspond to the number of the objective to which that activity relates.
PROPOSED LIST OF LEARNING ACTIVITIES

1. Textbook Reading:
   a. Reading assignments selected from the textbook.

2. Supplemental Reading:
   a. Any reading assignment outside of the textbook.
   b. Available in the learning center or library as indicated in the activity. (LC, Lib, Lib Res, etc.)

3. Minilecture:
   a. Any taped discussion not involving lab apparatus.
   b. Available at the learning center desk with supplemental printed information.

4. Demonstration:
   a. Any piece(s) of lab or demonstration equipment available with short printed instructions on how to use and what to observe.
   b. Available in the learning center under an appropriate standardized sign. (possibly a list of currently available demonstrations can be maintained on the bulletin board)

5. Narrated Demonstration:
   a. Same as 'Demonstration' except a tape player with an appropriate tape would be included with the equipment at the demonstration site.

6. Film Loop:
   a. Single concept films and film loops.
   b. To be checked out from the learning center desk and used in projectors located in the learning center.

7. Narrated Film Loops:
   a. Same as 'Film Loop' except an audio tape would be attached to the cassette to be used in a player located by the projectors.
8. Printed Lab Activity:
   a. Any lab activity in which printed information is used to guide the student through a process of data taking and data analysis.
   b. The printed information is to be picked up at the learning center desk and the lab equipment will be set up in the learning center under an appropriate sign.

9. Narrated Lab Activity:
   a. Same as 'Printed Lab Activity' except an audio tape would be used to guide the student through a process of data taking and data analysis.
   b. The tape would be available to be checked out at the learning center desk and used with the designated lab equipment.

10. Exhibit:
    a. Any poster, pieces of equipment, etc. used to illustrate specific ideas or problems.
    b. Placed in appropriate positions around the learning center or display case. (possibly a list of currently available exhibits can be maintained on the bulletin board)

11. Special Problems:
    a. Any specially prepared printed problem.
    b. Available at the learning center desk or placed where students can pick them up.

12. Textbook Problems:
    a. Any problem selected from the textbook.

13. Group Discussion:
    a. There will be groups of students meeting to discuss this topic. Add your name to a sign-up sheet or find another interested student and post a new sign-up sheet.

14. Computer Assisted:
    a. Go to any available computer terminal. You will receive instructions when you have typed RUN(41,99). Always bring pencil and scratch paper when you go for this type of lesson.

I-5
15. Instructor Conference:
   a. You should meet with your own instructor at this time. Please tell him that you are at a part of your lesson that calls for activity number XXXX.

16. Demonstration-Lecture:
Use of Learning Styles to Prescribe Learning Activities

Background

The following information is taken from the summary of the final report on Phase I of the learning styles project prepared by John Banks.

This project was jointly proposed and submitted by Fox Valley Technical Institute, District 12, and the Center for Vocational, Technical and Adult Education at the University of Wisconsin - Stout to the Wisconsin Board of Vocational, Technical and Adult Education. The project was undertaken to investigate the interaction of learning styles and types of learning experiences provided to students in vocational-technical education.

In June of 1972 the original project was funded by the Wisconsin Board of Vocational, Technical and Adult Education. In the fall of 1972 the University of Wisconsin - Stout submitted a sub-proposal to the Fox Valley Technical Institute to identify a sub-set of learning styles and to determine their relationship with the acquisition of technical skills and knowledges.

This study specifically identified two learning style continuums relevant to vocational and technical education programs. These two continuums were labeled as (1) concrete/symbolic and (2) structured/unstructured. To measure these continuums two instruments were originally developed, a semantic differential and a Likert scale. The pilot instruments were administered at the Fox Valley Technical Institute. Based on data gathered from the instruments, an individual was placed somewhere along each of the continuums. The relative position on a continuum determined the extent the individual was influenced by a particular learning style. An individual who located near the continuum midpoint would be affected by a composite of the continuum learning styles. A position near a continuum end was determined to show the individual as being highly affected by that style.

Phase II

This phase of the learning styles project deals with the problem of utilizing students' learning styles to prescribe individual learning
styles to prescribe individual learning activities. A student highly affected by a particular learning style would prefer to achieve the course objectives through those activities which most closely match his style of learning. This requires an individualized environment in which each student may engage in a unique set of learning activities.

A computerized system for providing student with a set of activities which most closely correlates with their styles of learning has been constructed. To achieve this matching of activities with students requires the input of "styles" information on both student and activities.

Student Information

The two learning style continuums identified by John Banks will be used in Phase II. Also, the learning style opinionnaire constructed and tested by Banks will be used to place each student along the continuum of the two styles. The opinionnaire will be administered on the opening day of classes and the information which consists of two numbers/student entered into the system through a terminal. If an electronic device is used for summarizing the papers, the styles for a few hundred students can be entered into their personal records in a few hours.

Activity Information (for the physics project)

The learning styles opinionnaire was administered to 93 students enrolled in Physics 223 in the Fall semester 1973. The results are as follows:

<table>
<thead>
<tr>
<th>Style</th>
<th>Count</th>
<th>Average</th>
<th>Standard Deviation</th>
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<tr>
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<td>Concrete</td>
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<tr>
<td>Unstructured</td>
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<td>4.2</td>
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<tr>
<td>Structured</td>
<td>55</td>
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</tbody>
</table>

These data will be used to arbitrarily associate each proposed learning activity in the basic physics modules with a point on each of the two style continuums.

The activities will then be ranked according to the degree to which they correspond with the students styles and presented in that order. The first activity associated with each objective will then be the activity which most closely matches the students preferred styles of learning.
INFORMATION TO STUDENTS

This is a description of the procedures you must follow to select a course of study and become enrolled with the Computer Managed Instructional System. Each step outlined below must be followed in the sequence in which it is presented.

I. Pretest and Learning Styles Questionnaire

1. Pretest--This test will be administered on the first day of class and the results will be entered into your record.

2. Learning Styles Questionnaire - this is a short questionnaire which is designed to provide information concerning your preferred modes of learning. The results of this questionnaire will also become part of your record and will be used later to provide individualized learning prescriptions.

II. Constructing Your Program

A list of available modules are attached to this information sheet. You are to select those modules which you want to be included in your program of study. Pay particular attention to prerequisite requirements and availability dates so your program and planned dates of starting each module do not conflict with the given information.

Select your program and write the module numbers and expected starting dates below:

<table>
<thead>
<tr>
<th>Module Nbr</th>
<th>Expected Starting Date</th>
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<tbody>
<tr>
<td></td>
<td>Month</td>
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</table>

81
K-1
PLEASE TYPE YOUR LAST NAME FIRST THEN SPACE AND FIRST NAME? HILGENDORF AB
CONFIRM HILGENDORF AB TYPE Y OR N? Y
PLEASE TYPE YOUR ID-NUMBER? 123-45-6789
CONFIRM 123-45-6789 TYPE Y OR N? N
ENROLLMENT OF HILGENDORF AB IS COMPLETE
WAIT

NAME PLEASE? HILH
SORRY - BUT I CAN'T FIND YOUR NAME ON THE CLASS LIST. PLEASE USE THE SAME NAME UNDER WHICH YOU ENROLLED OR TRY ENTERING YOUR LAST NAME ONLY.
NAME PLEASE? HILG
CONFIRM HILGENDORF AB 123-45-6789 TYPE Y OR N? N
WAIT
ENTER MODULE NUMBERS IN THE SEQUENCE IN WHICH YOU PLAN TO COMPLETE THEM. ALSO ENTER THE DATE YOU PLAN TO START EACH MODULE. LAST MODULE NUMBER SHOULD BE ZERO TO TERMINATE PROGRAM ENTRY.

MODULE #? 110
STARTING MONTH-XXX? AUG
DAY? 30
MODULE #? 115
STARTING MONTH-XXX? AUG
DAY? 30
MODULE #? 120
STARTING MONTH-XXX? SEP
DAY? 15
MODULE #? 125
STARTING MONTH-XXX? SEP
DAY? 30
STARTING DATE OUTSIDE MODULE AVAILABILITY - TRY AGAIN.
STARTING MONTH-XXX? SEP
DAY? 25
MODULE #? 0
PROGRAM ENTRY IS COMPLETE
WAIT

1-ENROLL, 2-PROGRM, 3-PGMLST, 4-STATUS, 5-NXTMOD, 6-TESTER
RUN MAINST

1-ENROLL, 2-PROGRM, 3-PGMLST, 4-STATUS, 5-NXTMOD, 6-TESTER

? 3
NAME PLEASE? A STU
CONFIRM A STUDENT
TYPE Y OR N? Y
WAIT

CURRENT PROGRAM
27-APR-74

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<tr>
<td>110</td>
<td>LINEAR MOTION &amp; TRAJECTORIES</td>
<td>.5</td>
<td>30 AUG 74</td>
</tr>
<tr>
<td>115</td>
<td>VECTORS AND FORCES</td>
<td>.4</td>
<td>5 SEP 74</td>
</tr>
<tr>
<td>120</td>
<td>FORCES - MOTION &amp; WORK</td>
<td>.4</td>
<td>10 SEP 74</td>
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<tr>
<td>125</td>
<td>ENERGY AND MOMENTUM</td>
<td>.6</td>
<td>20 SEP 74</td>
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<tr>
<td>130</td>
<td>CIRCULAR AND ROTATIONAL MOTION</td>
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<td>25 SEP 74</td>
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<td>150</td>
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<td>160</td>
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1-ENROLL, 2-PROGRM, 3-PGMLST, 4-STATUS, 5-NXTMOD, 6-TESTER

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NAME PLEASE? A STU
CONFIRM A STUDENT
TYPE Y OR N? Y
WAIT

STATUS OF A STUDENT
27-APR-74

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<th>LEVEL</th>
<th>SIZE</th>
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<td>22 APR 74</td>
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<td>115</td>
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1-ENROLL, 2-PROGRM, 3-PGMLST, 4-STATUS, 5-NXTMOD, 6-TESTER

K-3 83
LEARNING ACTIVITIES PRESCRIPTION FOR:  A STUDENT

MODULE # 125 ENERGY AND MOMENTUM 25-APR-74

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<tr>
<th>OBJ</th>
<th>ACTIVITY</th>
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<td>2 SUPPLEMENTAL READ: PSSC-P 300 SEC 17-1, 17-2</td>
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<td>2</td>
<td>1 TAPED MINILECTURE: &quot;PE-QUALITATIVE DISCUSSION&quot;</td>
</tr>
<tr>
<td>3</td>
<td>1 SUPPLEMENTAL READ: FREEMAN-P 199 SEC. 9.5-9.6</td>
</tr>
<tr>
<td>4</td>
<td>2 SUPPLEMENTAL READ: PSSC-P 320 SEC 18-1</td>
</tr>
<tr>
<td>5</td>
<td>1 TAPED MINILECTURE: &quot;KE AND NEWTON'S LAW&quot;</td>
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<tr>
<td>6</td>
<td>2 SUPPLEMENTAL READ: PSSC-P 320 SEC 18-1</td>
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<tr>
<td>7</td>
<td>1 NARRATED DEMONSTR: &quot;THE ROLLER COASTER&quot;</td>
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<td>8</td>
<td>1 SUPPLEMENTAL READ: FREEMAN-P 209 SEC 9.13</td>
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<td>9</td>
<td>1 TEXTBOOK PROBLEMS: P 93 #32</td>
</tr>
<tr>
<td>10</td>
<td>1 TEXTBOOK READING: P 95 SEC 8.1</td>
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<td>11</td>
<td>3 TEXTBOOK READING: P 96 SEC 8.2, 8.6</td>
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<tr>
<td>12</td>
<td>2 DEMONSTRATION: &quot;RECOIL VELOCITY&quot;</td>
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<td>13</td>
<td>1 NARRATED LAB ACT: &quot;MUZZLE VELOCITY OF A RIFLE&quot;</td>
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<td>14</td>
<td>1 TEXTBOOK READING: TOP P 96</td>
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<td>15</td>
<td>1 TAPED MINILECTURE: &quot;FORCES TO PROPEL PROJECTILES&quot;</td>
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1-ENROLL, 2-PRGRN, 3-PGMIST, 4-STATUS, 5-NXTMDS, 6-TESTER
LEARNING ACTIVITIES PRESCRIPTION FOR: A STUDENT

MODULE #125 ENERGY AND MOMENTUM 25-APR-74

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<th>OBJ</th>
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<td>SUPPLEMENTAL READ: PSSC-P 300 SEC 17-1, 17-2</td>
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<td>2</td>
<td>SUPPLEMENTAL READ: FREEMAN-P 199 SEC. 9.5-9.6</td>
</tr>
<tr>
<td>3</td>
<td>TEXTBOOK READING: P 83 SEC 7.5</td>
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<td>TEXTBOOK PROBLEMS: P 93 #27, 28</td>
</tr>
<tr>
<td></td>
<td>TAPE GUIDED LESSON: <em>PE-QUANTITATIVE ANALYSIS</em></td>
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<td>4</td>
<td>SUPPLEMENTAL READ: PSSC-P 320 SEC 18-1</td>
</tr>
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<td>TAPED MINILECTURE: <em>KE AND NEWTON'S LAW</em></td>
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<td>FILM LOOP: <em>CONSERVATION OF ENERGY</em></td>
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<td>NARRATED DEMONSTR: <em>THE ROLLER COASTER</em></td>
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<td>8</td>
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1-ENROLL, 2-PROGRM, 3-PGMLST, 4-STATUS, 5-NXTMØD, 6-TESTER
RUN EXPUSE
ENTER MONTH(XXX) AND DAY(99) YOU WANT REPORT TO START
? AUG 26

EXPECTED MODULE ENTRY
- BY DATE -

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READY
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READY
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