1974

Bachelor of Science Degree in Mechanical Engineering Technology

University of Rhode Island Faculty Senate

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TO: President Frank Newman
FROM: Chairman of the Faculty Senate

1. The attached BILL, titled Bachelor of Science Degree in Mechanical Engineering Technology, is forwarded for your consideration.

2. The original and two copies for your use are included.

3. This BILL was adopted by vote of the Faculty Senate on September 26, 1974.

4. After considering this bill, will you please indicate your approval or disapproval. Return the original or forward it to the Board of Regents, completing the appropriate endorsement below.

5. In accordance with Section 8, paragraph 2 of the Senate's By-Laws, this bill will become effective on October 17, 1974 (date), three weeks after Senate approval, unless: (1) specific dates for implementation are written into the bill; (2) you return it disapproved; (3) you forward it to the Board of Regents for their approval; or (4) the University Faculty petitions for a referendum. If the bill is forwarded to the Board of Regents, it will not become effective until approved by the Board.

September 30, 1974

Albert J. Lott
Chairman of the Faculty Senate

ENDORSEMENT

TO: Chairman of the Faculty Senate
FROM: President of the University

1. Returned.
2. Approved __________. Disapproved __________.
3. (If approved) In my opinion, transmittal to the Board of Regents is not necessary.

11/7/74

Frank Newman
President
ALTERNATE ENDORSEMENT 1.
TO: Chairman of the Board of Regents
FROM: The University President
1. Forwarded.
2. Approved.

____________________________  ____________________________
                  (date)                          President

ENDORSEMENT 2.
TO: Chairman of the Faculty Senate
FROM: Chairman of the Board of Regents, via the University President.
1. Forwarded.

____________________________
(Office)

ENDORSEMENT 3.
TO: Chairman of the Faculty Senate
FROM: The University President
1. Forwarded from the Chairman of the Board of Regents.

____________________________  ____________________________
                  (date)                          President

Original received and forwarded to the Secretary of the Senate and Registrar for filing in the Archives of the University.

____________________________
(Office)  Chairman of the Faculty Senate
Proposal
Joint Program in Mechanical Engineering Technology

It is proposed that a joint program leading to a Bachelor of Science degree in Mechanical Engineering Technology be offered by R.I. Junior College and the University of R.I. The first two years of the program would be offered at the Junior College and would lead to an Associate in Science degree in Mechanical Engineering Technology. The student who successfully completed the first two years would at this point be able to elect to either take a job in industry in a position such as an engineering aide or to continue his education by entering the university and completing two additional years necessary to obtain his BS in Mechanical Engineering Technology. Successful completion of the first two years would insure admission into the last two years of the program.

Rationale

In recent years there has been a great increase in the number of degree programs in Engineering Technology being offered by various institutions throughout the country. In preparing to present this proposal members of the committee visited Southeastern Massachusetts University in North Dartmouth, Mass. and Northeastern University in Boston, Mass.; both of which have added programs in Engineering Technology to their existing Engineering programs, and are at the present time offering two routes which a student may follow, both of which require four years of study and both of which lead to a BS degree, one in Engineering, the other in Engineering Technology.

In addition at the Fall 1972 meeting of the New England Section of the American Society for Engineering Education members of the committee discussed Engineering Technology programs with representatives of Wentworth Institute (which has added a four year BS program to its existing two year Associate Degree programs in Engineering Technology) and with representatives of the University of New Hampshire (which is instituting a two year program at the university leading to a BS in Engineering Technology which will be open to those who have received an associate's degree in Engineering Technology from a junior college).

The program which we are proposing is patterned after the New Hampshire program. With the Junior College already offering an Associate Degree in Mechanical Engineering Technology and with the close proximity of the two institutions it seemed only reasonable to propose such a joint program. Such a joint program would appear to make the best use of existing facilities and staff at both institutions and would make possible the addition of this new program without requiring the immediate addition of any new staff at either institution. Certainly if the attractiveness of
this program were to cause a large increase in enrollment in the
Junior College program then of course at that time they would
require more staff. While the University's portion of the
program requires the addition of new courses, it is felt that
it would be possible for the existing faculty to staff the program
at least in its initial phases.

The Engineering Technology programs are characterized by
being more applied in nature and less theoretically and mathemat-
ically based than are the Engineering Programs. While a large
percentage of students graduating with a BS in Engineering do
graduate work toward the MS or PhD degree, the student graduating
with the Engineering Technology degree would normally be expected
to enter an industrial position upon receipt of his BS. The
student receiving the Engineering Technology degree would be
expected to be in an excellent position to serve RI based private
industry since much of this industry is more production oriented
than research oriented.

The following remarks are summarized from the "Final Report -
Engineering Technology Education Study" of the American Society
for Engineering Education (The committee was chaired by Linton
E. Grinker of the University of Florida).

Engineering education programs appear to again be undergoing
a rapid evolution. After a period in which undergraduate
engineering curricula were being extended to a point where only
exceptional students finished in four years, and five-year under-
graduate curricula were being tried in a few institutions, a
reversed trend has developed. In recent years there has been a
tendency to reduce the requirements of Baccalaureate engineering
programs to a level that can be realistically met in four years,
of comparable length to curricula in liberal arts or science.
This trend is not due to a belief that engineering education can
be completed in a normal four-year curriculum but rather seems
related to a growing belief that an engineer who carries full
professional responsibility should have a more extensive
educational background than is commonly credited in professional
circles to the baccalaureate degree.

Whether the advanced professional education of the engineer
is conducted as study for the traditional master's degree or for
an advanced professional degree, the result seems likely to be
an extension beyond four years that will effectively increase
the differentiation between the education of the professional
engineer and the engineering technologist; in fact, it has been
in process for some time since approximately forty percent of
new engineering employees in 1969-70 had advanced degrees.
The most important recent trend in technological education is the interest of many universities in providing baccalaureate curricula in engineering technology. A factor that has disturbed engineering faculties is the rapid growth in student enrollment which has followed the inauguration of nearly all of the new baccalaureate technology programs while engineering enrollments have remained almost static. This condition may be attributed to the fact that only a small fraction of high school students show a strong interest in mathematics and science. Yet all are exposed to the marvels of an increasingly technological world. Thus an educational channel that provides professional or para-professional status through technological employment without the rigorous math-science requirement of engineering curricula appeals to many high school graduates.

As yet the number of graduates from baccalaureate technology curricula is small compared to the number of engineering graduates, but the growth trend is clearly upward. The absorption of these graduates into industry should not provide any problem at least for the next decade. Engineering technicians historically have been in short supply.

It is likely that future utilization patterns for technical manpower will call for enhanced preparation of the individuals entering technical employment. By 1980, employment priorities may justify some 50 percent of new entrants to technicians jobs to be educated to the associate degree level and another 25 percent to have baccalaureate technology degrees. If four-year engineering and industrial technology education should grow in volume to equal the production of engineers, it would then require, allowing for usual losses, nearly a ten-year output from such baccalaureate technological curricula to replace with such graduates one-fourth of the one million technicians now employed by industry and government. By that time the needs of industry for technological personnel would doubtless have grown commensurately.

In view of the above comments it appears obvious that there is a demand for people with technology degrees and that there are students available who would be anxious to participate in such a program. This therefore seems to provide an excellent opportunity to develop closer ties between the two educational institutions that would be involved in the program.
Mechanical Engineering Technology

The first two years of this program would be spent at Rhode Island Junior College. Upon completion of this two year program the student would receive an Associate in Science Degree in Mechanical Engineering Technology. The program for this degree would be as follows:

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>450-180 Technical Mathematics I</td>
<td>4</td>
</tr>
<tr>
<td>280-101 Composition I</td>
<td>3</td>
</tr>
<tr>
<td>260-103 Engineering Graphics</td>
<td>3</td>
</tr>
<tr>
<td>240-103 Fundamentals of Electricity &amp; Electronics</td>
<td>4</td>
</tr>
<tr>
<td>260-102 Introduction to Engineering &amp; Technology</td>
<td>3</td>
</tr>
<tr>
<td>[Total]</td>
<td>17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 2</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>450-181 Technical Mathematics II</td>
<td>4</td>
</tr>
<tr>
<td>260-102 Introduction to Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>470-113 Design Drafting</td>
<td>3</td>
</tr>
<tr>
<td>600-xxx Physics (Heat, Light, Sound)</td>
<td>4</td>
</tr>
<tr>
<td>Liberal Arts Elective</td>
<td>3</td>
</tr>
<tr>
<td>[Total]</td>
<td>17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 3</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>450-xxx Technical Mathematics III (Applied Calculus)</td>
<td>3</td>
</tr>
<tr>
<td>470-151 Mechanics (Station &amp; Dynamics)</td>
<td>4</td>
</tr>
<tr>
<td>470-292 Basic Mechanisms</td>
<td>4</td>
</tr>
<tr>
<td>260-210 Technical Report Writing or General Elective</td>
<td>3</td>
</tr>
<tr>
<td>Liberal Arts Elective</td>
<td>3</td>
</tr>
<tr>
<td>[Total]</td>
<td>17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 4</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>260-254 Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>450-xxx Technical Mathematics IV (Applied Calculus)</td>
<td>3</td>
</tr>
<tr>
<td>470-293 Machine Design</td>
<td>3</td>
</tr>
<tr>
<td>240-239 Electric Power Technology</td>
<td>3</td>
</tr>
<tr>
<td>600-293 Industrial Materials</td>
<td>3</td>
</tr>
<tr>
<td>260-256 Mechanical Engineering Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>[Total]</td>
<td>16</td>
</tr>
</tbody>
</table>

Total Credits 67
Any student who completed successfully the foregoing program would then be eligible to enter the Mechanical Engineering Technology program at the University of Rhode Island as a junior. Upon completion of these latter two years the student would receive a Bachelor of Science degree in Mechanical Engineering Technology. The remainder of his program would then be as follows:

### Semester 5

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 201</td>
<td>Introduction to Computing</td>
<td>3</td>
</tr>
<tr>
<td>MCE 340</td>
<td>Elementary Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>IDE 331</td>
<td>Manufacturing Processes I</td>
<td>3</td>
</tr>
<tr>
<td>MCE 311</td>
<td>Mechanical Engineering Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CME 332</td>
<td>General Education Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Physical Metallurgy</td>
<td>3</td>
</tr>
</tbody>
</table>

### Semester 6

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCE 345</td>
<td>Thermodynamic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MCE 321</td>
<td>Machine Design I</td>
<td>4</td>
</tr>
<tr>
<td>MCE 312</td>
<td>Mechanical Engineering Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>IDE 332</td>
<td>General Education Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Manufacturing Processes II</td>
<td>3</td>
</tr>
</tbody>
</table>

### Semester 7

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCE 421</td>
<td>Machine Design II</td>
<td>3</td>
</tr>
<tr>
<td>MCE 360</td>
<td>Introduction to Fluid Mechanics, Economics</td>
<td>3</td>
</tr>
<tr>
<td>EGN 123</td>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>General Education Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

### Semester 8

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCE 440</td>
<td>Thermal Systems Design</td>
<td>3</td>
</tr>
<tr>
<td>MCE 422</td>
<td>Design Project</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>General Education Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS - (8 semesters)** 128
The University of Rhode Island general education requirement would be met by the following:

Required Courses:

Division A - none
Division B - Mathematics
  Physics
  Chemistry
  16 credits RIJC
Division C - Economics
Division D - Composition
  Technical Report Writing
  3 credits URI
  3 credits RIJC
  6 credits
  (reduce A & C by
  3 credits each)

General Education Electives 18 credits
(3 credits in each of semesters 2, 3, and 5 through 8)

These must be taken as
Division A - 9 or 12 credits
Division C - 9 or 6 credits

18

18
To: Curricular Affairs Committee

From: Charles D. Nash, Chairman, Department of Mechanical Engineering and Applied Mechanics

Subject: Proposed new course in Mechanical Engineering and Applied Mechanics (MCE 340)

1. Proposed catalog listing:

340 Elementary Thermodynamics
I, 3
A study of the laws of thermodynamics, perfect gases and pure substances. The study will emphasize the calculation of thermodynamic processes. This course is intended for students in the engineering technology program. (Lec. 3)
Prerequisite: RIJC 200-102 and 470-151 or equivalent. Staff

2. Expected distribution of registrants:

This course is part of the proposed new program in Mechanical Engineering Technology and will be required of all the Juniors in the program. It is expected that the program will initially have at least fifteen students.

3. Place of course in curriculum:

(see item 2.)

4. Extent of Overlap:

Although there are other thermodynamics courses in the Department of Mechanical Engineering, the existing courses require a more extensive mathematical background.

5. New facilities required:

None

6. Availability of Personnel:

The course will be taught by existing Department members whose primary interest is in the practice of engineering. The need for additional personnel cannot be predicted at this time as it depends on the growth of the engineering technology program. The first students will start at R.I. Junior College in Sept. 1974 and it will be Sept. 1976 when they come to the University of Rhode Island.

7. Date when course will first be offered:

Fall semester 1976
8. Outline of course, MCE 340, Elementary Thermodynamics:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Lectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductory concepts</td>
<td>3</td>
</tr>
<tr>
<td>First law of thermodynamics</td>
<td>2</td>
</tr>
<tr>
<td>Control mass</td>
<td>3</td>
</tr>
<tr>
<td>Control volume</td>
<td>6</td>
</tr>
<tr>
<td>Second law of thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>Availability</td>
<td>3</td>
</tr>
<tr>
<td>Perfect gas</td>
<td>3</td>
</tr>
<tr>
<td>Pure substance</td>
<td>3</td>
</tr>
<tr>
<td>Thermodynamic tables</td>
<td>3</td>
</tr>
<tr>
<td>Thermodynamic diagrams</td>
<td>3</td>
</tr>
<tr>
<td>Process calculations</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>42</td>
</tr>
</tbody>
</table>

Typical Text: A text need not be selected for three years and texts more suitable than those currently in print will then be available.

Charles D. Nash, Chairman
Department of Mechanical Engineering and Applied Mechanics

Date

Lewis D. Conta, Dean
College of Engineering

Date
To: Curricular Affairs Committee

From: Charles D. Nash, Chairman, Department of Mechanical Engineering and Applied Mechanics

Subject: Proposed new course in Mechanical Engineering and Applied Mechanics (MCE 345)

1. Proposed catalog listing:

345 Thermodynamic Analysis
Continuation of MCE 340 with emphasis on mixtures and combustion processes. Elementary concepts of cycle analysis. Introduction to Heat Transfer. This course is intended for students in the Mechanical Engineering Technology program. (Lec. 3) Prerequisite: MCE 340. Staff

2. Expected distribution of registrants:

This course is part of the proposed new program in Mechanical Engineering Technology and will be required of all the Juniors in the program. It is expected that the program will initially have at least fifteen students.

3. Place of course in curriculum:

(see item 2.)

4. Extent of Overlap:

Although there are other thermodynamics courses in the Department of Mechanical Engineering they do not form a suitable sequence with MCE 340.

5. New facilities required:

None

6. Availability of personnel:

The course will be taught by existing Department members whose primary interest is in the practice of engineering. The need for additional personnel cannot be predicted at this time as it depends on the growth of the engineering technology program. The first students will start at R.I. Junior College in Sept. 1974 and it will be Sept. 1976 when they come to the University of Rhode Island.

7. Date when course will first be offered:

Spring semester 1977
8. Outline of course, MCE 345, Thermodynamic Analysis:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Lectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixtures of gases</td>
<td>3</td>
</tr>
<tr>
<td>Mixtures of gases and vapors</td>
<td>6</td>
</tr>
<tr>
<td>Combustion processes</td>
<td>9</td>
</tr>
<tr>
<td>Conduction heat transfer</td>
<td>7</td>
</tr>
<tr>
<td>Convection heat transfer</td>
<td>10</td>
</tr>
<tr>
<td>Radiation heat transfer</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>42</td>
</tr>
</tbody>
</table>

Typical Text: A text need not be selected for three years and texts more suitable than those currently in print will then be available.
To: Curricular Affairs Committee

From: Charles D. Nash, Chairman, Department of Mechanical Engineering and Applied Mechanics

Subject: Proposed new course in Mechanical Engineering and Applied Mechanics (MCE 440)

1. Proposed catalog listing:

440 Thermal Systems Design
The study and design of automotive combustion systems, refrigeration plants, air-conditioning systems, and heating installations. Energy balance studies of power plants. This course is intended for those students in the engineering technology program. (Lec. 3) Prerequisite: MCE 345
Staff

2. Expected distribution of registrants:

This course is part of the proposed new program in Mechanical Engineering Technology and will be required of all the Seniors in the program. It is expected that the program will initially have at least fifteen students. This course will not be allowed for graduate credit.

3. Place of course in curriculum:

(see item 2.)

4. Extent of Overlap:

Some of the topics in this course are given in various other courses but this is the only course combining all of these topics.

5. New facilities required:

None

6. Availability of personnel:

The course will be taught by existing Department members whose primary interest is in the practice of engineering. The need for additional personnel cannot be predicted at this time as it depends on the growth of the engineering technology program. The first students will start at R.I. Junior College in Sept. 1974 and it will be Sept. 1976 when they come to the University of Rhode Island.

7. Date when course will first be offered:

Spring semester 1978
8. Outline of course, MCE 440, Thermal Systems Design:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Lectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power plant energy balance</td>
<td>6</td>
</tr>
<tr>
<td>Automotive combustion systems</td>
<td>6</td>
</tr>
<tr>
<td>Refrigeration cycles</td>
<td>4</td>
</tr>
<tr>
<td>Refrigeration plant design</td>
<td>5</td>
</tr>
<tr>
<td>Warm air heating systems</td>
<td>5</td>
</tr>
<tr>
<td>Hot water heating systems</td>
<td>6</td>
</tr>
<tr>
<td>Air-conditioning processes</td>
<td>4</td>
</tr>
<tr>
<td>Air-conditioning system design</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>42</td>
</tr>
</tbody>
</table>

Typical text: This course will not utilize a particular text but will rely on a library reading list plus notes distributed by the instructor.

Charles D. Nash, Chairman
Department of Mechanical Engineering and Applied Mechanics

Date

Lewis W. Conta, Dean
College of Engineering

Date
To: Curricular Affairs Committee

From: Charles D. Nash, Chairman, Department of Mechanical Engineering and Applied Mechanics

Subject: Proposed new course in Mechanical Engineering and Applied Mechanics (MCE 360)

1. Proposed catalog listing:

360 Elementary Fluid Mechanics
Properties of fluids. Fluid statics. Applications of continuity, energy, and momentum equations. Flow through pipes and around immersed bodies. Fluid machinery. (Lec. 3)
Prerequisite: RIJC 470-151 or equivalent. Staff

2. Expected distribution of registrants:

This course is part of the proposed new program in Mechanical Engineering Technology and will be required of all the Juniors in the program. It is expected that the program will initially have at least fifteen students.

3. Place of course in curriculum:

(see item 2.)

4. Extent of Overlap:

Although there are other fluid mechanics courses in the Department of Mechanical Engineering, existing courses require a more extensive mathematical background.

5. New facilities required:

None

6. Availability of Personnel:

The course will be taught by existing Department members whose primary interest is in the practice of engineering. The need for additional personnel cannot be predicted at this time as it depends on the growth of the engineering technology program. The first students will start at R.I. Junior College in Sept. 1974 and it will be Sept. 1976 when they come to the University of Rhode Island.

7. Date when course will first be offered:

Fall semester 1977
8. Outline of course, MCE 350, Elementary Fluid Mechanics:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Lectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid properties</td>
<td>3</td>
</tr>
<tr>
<td>Fluid statics</td>
<td>4</td>
</tr>
<tr>
<td>Continuity</td>
<td>3</td>
</tr>
<tr>
<td>Momentum equation</td>
<td>4</td>
</tr>
<tr>
<td>Energy equation</td>
<td>4</td>
</tr>
<tr>
<td>Viscosity</td>
<td>2</td>
</tr>
<tr>
<td>Pipe flow</td>
<td>6</td>
</tr>
<tr>
<td>Forces on immersed bodies</td>
<td>4</td>
</tr>
<tr>
<td>Fluid machinery</td>
<td>6</td>
</tr>
<tr>
<td>Lubrication</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>

Typical Text: Fluid Mechanics, Fourth Edition by Raymond C. Binder
To: Curricular Affairs Committee

From: Charles D. Nash, Chairman, Department of Mechanical Engineering and Applied Mechanics

Subject: Proposed new course in Mechanical Engineering and Applied Mechanics (MCE 321)

1. Proposed catalog listing:

   321 Machine Design I

   II, J


   Prerequisite: RISC 470-283 or equivalent. Staff

2. Expected distribution of registrants:

   This course is part of the proposed new program in Mechanical Engineering Technology and will be required of all the Juniors in the program. It is expected that the program will initially have at least fifteen students.

3. Place of course in curriculum:

   (see item 2.)

4. Extent of Overlap:

   There are other machine design courses in the Department of Mechanical Engineering which stress design principles, but the proposed course will emphasize design methods which have immediate industrial application.

5. New facilities required:

   None

6. Availability of Personnel:

   The course will be taught by existing Department members whose primary interest is in the practice of engineering. The need for additional personnel cannot be predicted at this time as it depends on the growth of the engineering technology program. The first students will start at R.I. Junior College in Sept. 1973 and it will be Sept. 1976 when they come to the University of Rhode Island.

7. Date when course will first be offered:

   Spring semester 1977
8. Outline of course, MCE 321, Machine Design I:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Lectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vectors</td>
<td>2</td>
</tr>
<tr>
<td>Motion and Displacement</td>
<td>2</td>
</tr>
<tr>
<td>Velocity</td>
<td>4</td>
</tr>
<tr>
<td>Acceleration</td>
<td>3</td>
</tr>
<tr>
<td>Geometry of Motion</td>
<td>2</td>
</tr>
<tr>
<td>Spur Gears</td>
<td>5</td>
</tr>
<tr>
<td>Helical, Worm and Bevel Gears</td>
<td>3</td>
</tr>
<tr>
<td>Mechanism Trains</td>
<td>5</td>
</tr>
<tr>
<td>Cams</td>
<td></td>
</tr>
<tr>
<td>Stress Analysis</td>
<td>5</td>
</tr>
<tr>
<td>Beams</td>
<td>3</td>
</tr>
<tr>
<td>Columns</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>42</td>
</tr>
</tbody>
</table>

Typical Text: A text need not be selected for three years and texts more suitable than those currently in print will then be available. Typical existing texts are:

"Kinematics of Machines" by Church and

"Design of Machine Elements" by Spotts.
To: Curricular Affairs Committee

From: Charles D. Nash, Chairman, Department of Mechanical Engineering and Applied Mechanics

Subject: Proposed new course in Mechanical Engineering and Applied Mechanics (MCE 421)

1. Proposed catalog listing:

421 Machine Design II

Study of machine elements such as screws, springs, keys, couplings, bearings, gears, brakes, and clutches. Topics include stress analysis, fatigue loading, stress concentrations. (Loc. 3) Prerequisite: MCE 321. Staff

2. Expected distribution of registrants:

This course is part of the proposed new program in Mechanical Engineering Technology and will be required of all the Juniors in the program. It is expected that the program will initially have at least fifteen students.

3. Place of course in curriculum:

(see item 2.)

4. Extent of Overlap:

Although there are other machine design courses in the Department of Mechanical Engineering they do not form a suitable sequence with MCE 321.

5. New facilities required:

None

6. Availability of Personnel:

The course will be taught by existing Department members whose primary interest is in the practice of engineering. The need for additional personnel cannot be predicted at this time as it depends on the growth of the engineering technology program. The first students will start at R.I. Junior College in Sept. 1974 and it will be Sept. 1976 when they come to the University of Rhode Island.

7. Date when course will first be offered:

Fall semester 1977
8. Outline of course, MCE 421, Machine Design II:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Lectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerances and Allowances</td>
<td>1</td>
</tr>
<tr>
<td>Variable Loads</td>
<td>2</td>
</tr>
<tr>
<td>Stress Concentrations</td>
<td>2</td>
</tr>
<tr>
<td>Screw Fastenings</td>
<td>2</td>
</tr>
<tr>
<td>Rivets</td>
<td>1</td>
</tr>
<tr>
<td>Springs</td>
<td>4</td>
</tr>
<tr>
<td>Columns</td>
<td>2</td>
</tr>
<tr>
<td>Shaft design</td>
<td>3</td>
</tr>
<tr>
<td>Keys</td>
<td>2</td>
</tr>
<tr>
<td>Couplings</td>
<td>3</td>
</tr>
<tr>
<td>Journal Bearings</td>
<td>3</td>
</tr>
<tr>
<td>Ball and Roller Bearings</td>
<td>3</td>
</tr>
<tr>
<td>Spur Gear Strength</td>
<td>4</td>
</tr>
<tr>
<td>Worm Gearing</td>
<td>3</td>
</tr>
<tr>
<td>Brakes and Clutches</td>
<td>4</td>
</tr>
<tr>
<td>Welded Joints</td>
<td>3</td>
</tr>
</tbody>
</table>

Typical Text: A text need not be selected for three years and texts more suitable than those currently in print will then be available. A typical existing text is "Design of Machine Elements" by Spotts.

Charles J. Nash, Chairman
Department of Mechanical Engineering and Applied Mechanics

Date

Lewis D. Conta, Dean
College of Engineering

Date
To: Curricular Affairs Committee

From: Charles D. Nash, Chairman, Department of Mechanical Engineering and Applied Mechanics

Subject: Proposed new course in Mechanical Engineering and Applied Mechanics (MCE 422)

1. Proposed catalog listing:

   422 Design Project
   
   Students will work in small groups on an original mechanical design. Consideration will be given to stresses, deflections, materials, manufacturing methods and costs. Case studies of recent designs. (Lec. 3) Prerequisite: MCE 421. Staff

2. Expected distribution of registrants:

   This course is part of the proposed new program in Mechanical Engineering Technology and will be required of all the Seniors in the program. It is expected that the program will initially have at least fifteen students.

3. Place of course in curriculum:

   (see item 2.)

4. Extent of Overlap:

   Design projects used in this course will be suitable for the students' background. They will differ substantially in content and emphasis from topics used in MCE 429 - Comprehensive Design.

5. New facilities required:

   None

6. Availability of Personnel:

   The course will be taught by existing Department members whose primary interest is in the practice of engineering. The need for additional personnel cannot be predicted at this time as it depends on the growth of the engineering technology program. The first students will start at R.I. Junior College in Sept. 1974 and it will be Sept. 1976 when they come to the University of Rhode Island.

7. Date when course will first be offered:

   Spring semester 1978
8. Outline of course, MCE 422, Design Project:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Lectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design of Screw Jack</td>
<td>4</td>
</tr>
<tr>
<td>Design of Friction Tester</td>
<td>6</td>
</tr>
<tr>
<td>Design Project</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>42</td>
</tr>
</tbody>
</table>

Typical Text: This course will not utilize a particular text but will rely on a library reading list plus notes distributed by the instructor.

Charles D. Nash, Chairman  
Department of Mechanical Engineering and Applied Mechanics  

Date

Lewis D. Conta, Dean  
College of Engineering  

Date
To: Curricular Affairs Committee

From: Charles D. Nash, Chairman, Department of Mechanical Engineering and Applied Mechanics

Subject: Proposed new course in Mechanical Engineering and Applied Mechanics (MCE 311)

1. Proposed catalog listing:

   311 Mechanical Engineering Laboratory

   Data analysis, curve plotting and fitting, basic measurement techniques and principles of error evaluation. Selection and use of mechanical engineering laboratory instrumentation.

   Prerequisite: Junior standing in the Mechanical Engineering Technology program. (Lab 3) Staff

2. Expected distribution of registrants:

   This course is part of the proposed new program in Mechanical Engineering Technology and will be required of all the Juniors in the program. It is expected that the program will initially have at least fifteen students.

3. Place of course in curriculum:

   (see item 2.)

4. Extent of Overlap:

   There is some overlap with existing laboratory courses, but the proposed course emphasizes application of laboratory instrumentation whereas existing courses emphasize the theory on which the instrumentation is based.

5. New facilities required:

   None

6. Availability of Personnel:

   The course will be taught by existing Department members whose primary interest is in the practice of engineering. The need for additional personnel cannot be predicted at this time as it depends on the growth of the engineering technology program. The first students will start at R.I. Junior College in Sept., 1974 and it will be Sept., 1976 when they come to the University of Rhode Island.

7. Date when course will first be offered:

   Fall semester 1976

Charles D. Nash, Chairman
Department of Mechanical Engineering and Applied Mechanics

Date

Lewis D. Conta, Dean
College of Engineering

Date
To: Curricular Affairs Committee

From: Charles D. Nash, Chairman, Department of Mechanical Engineering and Applied Mechanics

Subject: Proposed new course in Mechanical Engineering and Applied Mechanics (MCE 312)

1. Proposed catalog listing:

   312 Mechanical Engineering Laboratory

   Comprehensive tests on prime movers and mechanical apparatus, such as boilers, turbines, internal combustion engines, pumps, refrigeration equipment, compressors, etc. Prerequisite: MCE 311 (Lab 6). Staff

2. Expected distribution of registrants:

   This course is part of the proposed new program in Mechanical Engineering Technology and will be required of all the Juniors in the program. It is expected that the program will initially have at least fifteen students.

3. Place of course in curriculum:

   (see item 2.)

4. Extent of Overlap:

   This is a course devoted exclusively to performance testing and no such course now exists.

5. New facilities required:

   None

6. Availability of Personnel:

   The course will be taught by existing Department members whose primary interest is in the practice of engineering. The need for additional personnel cannot be predicted at this time and it depends on the growth of the engineering technology program. The first students will start at R.I. Junior College in Sept. 1974 and it will be Sept. 1976 when they come to the University of Rhode Island.

7. Date when course will first be offered:

   Spring semester 1977

Charles D. Nash, Chairman
Department of Mechanical Engineering and Applied Mechanics

Date

Lewis D. Conta, Dean
Date
To: Curricular Affairs Committee

From: C.F. James, Jr., Chairman, Department of Industrial Engineering

Subject: Proposed new course in Industrial Engineering (IDE 331)

1. Proposed Catalog Listing:

331 Industrial Manufacturing Processes I

I, 3

Introduction to the fundamentals of chip forming processes in manufacturing and their relation to materials deformation produced by the interaction of the cutting tools with the materials. Emphasis on what the processes will do, how they do it, their accuracy, relative advantages and limitations, and relation to surface integrity of machined surface. (Lec. 3)

Prerequisite: RIJC 800-293. Staff

2. Expected Distribution of Registrants:

This course is part of the proposed new program in Mechanical Engineering Technology and will be required of all 1st semester Juniors in the program. It is expected that the program will initially have at least fifteen students.

3. Place of Course in Curriculum:

(see item 2.)

4. Extent of Overlap:

While there is a manufacturing processes course in the Industrial Engineering Department, it currently does not have either breadth of coverage or the practical applications emphasis required in this offering.

5. New Facilities Required:

None

6. Availability of Personnel:

The course will be taught by existing Department members whose primary interest is the practice of engineering. The need for additional personnel cannot be predicted at this time as it depends on the growth of the engineering technology program. The first students will start at R.I. Junior College in September 1974 and it will be September 1976 when they come to the University of Rhode Island.
7. Date When Course Will First be Offered:
   Fall Semester 1977

3. Outline of Course:
   1) Introduction to Metal Cutting
   2) Metrology and Measurement
   3) Structure and Strength of Materials (Review)
   4) Metal Cutting Mechanics
   5) Friction, Lubrication and Wear
   6) Cutting Tools
      a. Materials
      b. Tool Wear and Tool Life
   7) Cutting Fluids
   8) Metal Cutting Machine Tools
      a. Single Point Processes (Lathe, Shaper, etc.)
      b. Multiple Tooth Processes (Milling, Drilling, Broaching, etc.)
      c. Grinding Processes (Lapping, Honing, Abrasive Finishing)
      d. Design and Dynamics
   9) Numerical Control
      a. Concept and Theory
      b. Practice
   10) Economics of Machining

Texts - "Machining of Metals", E. J. A. Armarego and R. H. Brown
To: Curricular Affairs Committee

From: C.F. James, Jr., Chairman
    Department of Industrial Engineering

Subject: Proposed new course in Industrial Engineering (IDE 332)

1. Proposed Catalog Listing:

   332 Industrial Manufacturing Processes II
   II, 3

   Application and practical fundamentals of forming, casting,
   joining processes in manufacturing and their relation to
   deformation, structure or state of material. Will include
   study of nontraditional processes, such as electrodischarge
   machining, etc. (Lec. 3) Prerequisite: IDE 331. Staff

2. Expected Distribution of Registrants:

   This course is part of the proposed new program in Mechanical
   Engineering Technology and will be required of all the Juniors
   in the program. It is expected that the program will initially
   have at least fifteen students.

3. Place of Course in Curriculum:

   Second Semester - Junior Year

4. Extent of Overlap:

   While there is a manufacturing processes course in the
   Industrial Engineering Department, it currently does not have
   either the in depth coverage of processes nor the practical
   applications emphasis required in this offering.

5. New Facilities Required:

   None

6. Availability of Personnel:

   The course will be taught by existing Department members
   whose primary interest is the practice of engineering. The
   need for additional personnel cannot be predicted at this
   time as it depends on the growth of the engineering technology
   program. The first students will start at R.I. Junior College
   in September 1974 and it will be September 1976 when they come
   to the University of Rhode Island.
7. Date When Course Will First be Offered:
   Spring Semester 1977

3. Outline of Course:
   1) Casting Processes
      a. Solidification of metals - ferrous and nonferrous
      b. Sand, Shell, Permanent mold, Die, Investment, etc.
      c. Applications in the Jewelry Industry
   2) Forming Processes
      a. Hot working processes
      b. Cold working processes
      c. Powder metallurgy
   3) Joining Processes
      a. Welding
      b. Brazing and soldering
      c. Mechanical
      d. Adhesives
      e. Nontraditional processes
         1. Laser
         2. Electron beam
         3. Plasma arc
         4. Water jet
   4) Nontraditional or Chipless Processes
      a. EDM, ECM, ECG
      b. Chemical milling, electroplating and electroforming
      c. Ultrasonic processes

Text - "Materials and Processes in Manufacturing", DeGarme, E. P.