Report Of The Sub-Committee On New Programs For The 21st Century
February 26, 1997
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EXECUTIVE SUMMARY
The Task Force on New Programs was charged with "developing a list of new programs and priorities designed to best educate WPI students in the next decade and plan for continuing that process." The Task Force met weekly from mid January to February 25, 1997. The early meetings were brainstorming sessions in which the Task Force defined the scope of its task, identified the salient characteristics of "new programs," and discussed possible criteria to use in evaluating them. The Task Force solicited the input of the rest of the campus community by asking for suggestions through email and by holding an open meeting on February 12.

The following report and appendix are the results of our work. We have identified new programs in the areas of Life Sciences, Humanities and Arts, Management, Social Science, Non-traditional Learners, and Learning Environments. We were also presented with proposals for new and/or expanded programs for Special Needs Students, the Center for Educational Development, the Freshman Year Experience, Education Degrees, and A Master Builder Program. The programs range in cost from a few thousand to several million dollars, including new faculty and facilities. Some of the programs are already in existence, but require new resources; some are well advanced in the developmental stage (e.g. Management, Advanced Distant Learning Network - ADLN, Master Builder); yet others are in the embryo stage. What all of these
programs share is a vision consistent with the mission of WPI --- to educate men and women for the challenges of a technological, global society.

During the course of our deliberations, we became aware that other Task Forces were also reviewing new programs. After much discussion, we concluded that the proposals we received could best be prioritized from an institutional perspective by the Strategic Plan Steering Committee in the light of WPI's broader institutional goals and the recommendations of all the respective Task Forces. We recommend that the new program initiatives described in our report be considered for further deliberation and ranked with other proposals from such an institutional perspective. We believe that a number of initiatives in our report deserve serious consideration and a substantial commitment of WPI's resources. We also feel, that once the broader institutional goals have been identified, the "fit" of several of these programs will be readily apparent. To that end, we have proposed a set of criteria that could be used to evaluate new programs both at present and in the future, (Criteria for New Programs).

To create new programs is one of the most significant and exciting endeavors in higher education. This Task Force is pleased to have had the opportunity to participate in this important process.

BACKGROUND AND INTRODUCTION
A commitment to innovative, new programs has long been the hallmark of a WPI education. The founders of the university selected a motto -- lehr und kunst -- that expressed their dedication to renew the curriculum in the continual process of combining theory and practice. This "Two Towers" tradition became a venerated icon of WPI for well for over a century. Twenty-five years ago, however, the faculty had become frustrated by the limitations of traditional engineering education and they spent several years developing a revolutionary new program, the WPI Plan. The project-based character of this WPI Plan has also fostered the constant development and implementation of new programs and project opportunities. In recent years, for example, the Global Perspective Program and the diverse programs funded by Interface Discipline Initiatives have attempted both to enrich existing programs and to extend and enhance the curriculum in new areas that build on WPI's strengths. As WPI engages in the
strategic planning that will shape its direction into the twenty-first century, this task force reaffirms the central place that "new programs" have had in the past, and recommits WPI to developing such programs in the future.

FORMATION OF TASK FORCE
The Strategic Plan Steering Committee established our Task Force on "New Programs for the 21st Century" with the following charge:

"Develop a list of new programs and priorities designed to best educate students in the next decade and plan for continuing that process."

To accomplish these two objectives, an interdisciplinary team was formed of the following people:

Helen G. Vassallo, Chair
Management Department
Ronald D. Cheetham
Biology and Biotechnology Department
Peter R. Hansen
Humanities Department
Arlene R. Lowenstein
Director of Continuing Education
Michael C. Malchiodi
WPI Undergraduate Student, Mechanical Engineering
Keith Melvin
Guillermo Salazar
Civil Engineering Department
Susan Vick, Steering Committee Coordinator
Humanities Department

METHODS
The sub-committee met weekly during January and February 1997. The early meetings were brainstorming sessions in which the sub-committee defined the scope of its task and discussed criteria for evaluating new programs. The sub-committee also discussed potential academic programs of which it was aware. An open meeting was held on campus on February 12th. In addition, WPI faculty were invited to submit any last-minute inputs for consideration by the sub-committee. These inputs, as well as other background information, are provided in Appendix A.

What are "new academic programs"?
The sub-committee finds the material presented in Figure 1 to be of assistance in looking at "new programs", which can take the form of new products to old customers, new technologies to old customers, new technologies for old or new products and so on. The suggestions brought forth ran the gamut of all possible permutations.

![Diagram of Technology, Products, Customers]

**SUMMARY OF MATERIAL SUBMITTED TO THE TASK FORCE**
A large amount of material was received from various parts of the academic community. The material was collated and summarized. The original material appears in the Appendix; the salient points are summarized in this section.

Some initiatives are in the early proposal stage, others further along, and still others in a mature state that could be evaluated for further institutional support. Still others have been approved and are undergoing modification presently.

**Life Sciences Initiatives**  
(These initiatives also address new facilities)

**Biomedical Engineering:**
The proposal is to add a new undergraduate engineering program in Biomedical Engineering. The request is for more resources and facilities to enable the
program to get off to a fast start. (Note: this program was formally approved by the WPI faculty and is now in its first year of operation)

**Biology/Biotechnology:**
The Department has identified two new interdisciplinary programs that are likely to be very important growth areas for many years to come. Each area would build upon existing WPI strengths and would attract new students to WPI. New facilities would be required to implement these programs.

**Life Sciences Center:**
This proposal is for a new academic building to house, under one roof, all WPI personnel doing research and teaching in the Life Sciences. Such a grouping would encourage and support the types of interdisciplinary problem solving at which WPI excels. A new academic building could also house and showcase many of the activities WPI most prizes: IQP’s, global programs, communications and innovative teaching based on the most current technologies.

**Biochemistry:**
This existing program is growing rapidly and is attracting a number of students.

**Humanities Initiatives**

**International Studies:**
WPI has one of the most successful global programs in the US, but little in the way of formal studies on international topics and cultures. This initiative would strengthen our already strong global program and help attract new students.

**Technical, Scientific And Professional Communications (TSPC):**
The Tech Writing Program is already successful at attracting students who double major in this area. This popular program is saturated with students and needs more resources to expand, and to broaden and improve its offerings.

**Virtual Reality Performance Laboratory (Theater):**
Performance in cyberspace is an exciting new development in theater technology. This activity is appealing to WPI students and the Institute has the opportunity to be a leader in this emerging medium.
Living Museums:
Projects are available for IQPs at a number of museums in the local area, including the Fruitlands Museums, Higgins Armory Museum Mechanics Hall and the Worcester Historical Museum. Additional projects are available during E Term at the Royal Armouries of the Tower of London and at the Imperial War Museum.

Writing And Undergraduate Education:
There are several writing programs at WPI and a Writing Center. Support is sought to expand and improve these important activities.

Management Department Initiative
(This initiative also addresses new facilities)

A revised and expanded Management curriculum with an expected large increase in Undergraduate Management majors is put forth. With the increased emphasis on management skills in industry, the desirability of a double major with Management or a Management minor appears obvious. A new building is suggested which would house Management, Continuing Education and a parking garage.

Social Science Initiatives
System Dynamics (Social Sciences):
WPI already has a unique, but very limited, undergraduate program in system dynamics. Such a program is a good fit with WPI's technical training. More resources are sought to expand and improve the program.

Science Engineering And Public Policy(SEPP)
A new SEPP masters program is proposed by the Social Science Department. Such programs have been successful at other universities in attracting students.

The Non-Traditional Student
Continuing Education And Life Long Learning
The need for re-training and life long learning are likely to increase in the future. WPI has an excellent record of achievement in these areas and we could capture more of this growing market if we decide to make this a priority.
Industry-WPI Training Programs:
The Workforce Development Program, run in conjunction with the Commonwealth of Massachusetts, has devised a set of courses to improve personnel skills. Some of these are technical and match well with WPI's technical strengths. The Civil and Environmental Engineering Department has established a collaborative relationship with Metcalf and Eddy, Inc., a leading environmental consulting firm in the Boston area. This program has initially emphasized a series of full-credit graduate courses offered at M&E facilities open to employees and other qualified graduate students. The CEE Department is presently exploring possibilities for expanding this program to include a range of professional activities.

Advanced Distant Learning Network (ADLN):
Already a number of departments have distance learning initiatives underway. This mode of instruction involves the thrust of new technology on existing and new programs. WPI's involvement in this arena could bring in a number of new users as well.

Other Special Needs (ADD) Students:
Students with attention deficit disorder (ADD) are generally at a disadvantage in traditional timed assessments. WPI's project based education seems well suited to the needs of these students.

Center For Educational Development (CED):
An endowment is sought to provide stable funding for this Center and its personnel. The function of CED is to promote better and more efficient teaching at all levels.

The Freshman Year Experience
Students attend WPI, in large measure, because of the attractiveness of the project system. At the present time, students are not able to have such an experience until later in their college career. Attention should be paid to this arena.
Education Degrees:
It has been suggested that the Institute should initiate a program for teacher certification, particularly in math and science.

Master Builder Program At WPI:
The Civil and Environmental Engineering Department has established a new professionally-oriented Master of Engineering degree program. The intent of this program is to accelerate professional training of students by combining the BS and Master of Engineering Degrees and to attract industry-sponsored research in the area of process integration. The program is also open to other qualified graduate students.

PLAN OF ACTION
The Task Force received the following charge from the Steering committee:
"develop a list of new programs and priorities designed to best educate students in the next decade and plan for continuing this process."

The Task Force believes that, in order for the first part of this charge to be fulfilled, it would be appropriate for the Steering Committee to request proponents of initiatives to prepare detailed proposals in accordance with a model such as the Evaluation Criteria in Figure 2.

Figure 2. Criteria for New Programs

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>DESCRIPTION OF HOW FULFILLED</th>
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<tr>
<td>Attractive to students</td>
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<tr>
<td>Exciting career options</td>
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<tr>
<td>Consistent with WPI's mission and vision</td>
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<tr>
<td>Use existing WPI strengths</td>
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<tr>
<td>Unique to WPI</td>
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<tr>
<td>Addresses society's emerging problems</td>
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<tr>
<td>Makes use of emerging technology Opportunities</td>
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<tr>
<td>Financial resources needed</td>
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<tr>
<td>Other resources needed</td>
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<td>Funding possibilities</td>
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<td>Barriers to implementation</td>
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<td>Other</td>
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Adapted from Biology/Biotechnology Department Document
For the second part of its charge, the Task Force recommends the following steps be taken, as a permanent process:

- that within the budget process, financial resources be committed for "new programs" in general;
- that there be an ongoing institutional process of promoting new programs;
- that an institutional process be developed for evaluating proposals in a manner similar to the aforementioned criteria. (Figure 2);
- that there be a periodic review of all academic programs with respect to their ongoing contributions to the mission of the Institute.