Graduate Programs Task Force Report to Strategic Planning Steering Committee
March 27, 1997
William Durgin, Academic Affairs
David Cyganski, ECE
Lisa Jernberg, Graduate Admissions
David Lucht, FPE
Amy Marr, MSM student and Web Coordinator
Craig Wills, CS

Recommended Campaign Elements

- **Graduate Project Centers for Professional Practice**
  Project centers for projects and practica would go far to strengthen practice oriented degrees. Incorporation of project activity in degree requirements, analogous to the undergraduate program, would establish a real-world experience for those students studying to improve their professional positions. The WPI network of domestic and global project centers could be utilized as sites for the Graduate Project Centers.

- **Graduate Internships in U.S. and Overseas**
  Analogous to medical training, which includes a clinical experience, our practice-oriented degrees could significantly benefit from the inclusion of internships. Such activities not only provide an economic resource to meet costs but also provide essential professional practice experience.

- **Enhanced Research Facilities**
  First class, laboratories are essential so that hands-on teaching of state of the art experimental techniques is available to a majority of our graduate students. Such experience is critical to both those students destined for industrial research and development as well as those intending to pursue basic research careers in academic or research laboratories. The added value of such facilities is manifest in attracting faculty, graduate students, and research funding.

- **Research Chairs for Young Faculty**
  These chairs would provide a reduced teaching load and provide discretionary funds for untenured faculty. They would foster a rapid
engagement of research programs and be attractions for recruitment of outstanding faculty.

- **Endowed Industrial/Minority/and Part-time Student Fellowship**
  In the spirit of increasing the number of high quality full and part-time graduate students to WPI, the Graduate Programs Task Force identified specific areas that we believe would benefit from enhanced monetary support. The endowed industrial and minority fellowships are fairly clear in regards to the proposed recipients and how funding such students through increased fellowship opportunities would benefit WPI. Shifting our focus to the part-time student, nominal awards (e.g. one-time awards of $500 based on merit) would be helpful in attracting an increased number of quality part-time applicants to WPI’s applicant pool. Even though the dollar amount here is not significant, it is enough to result in positive sentiments towards WPI.

- **Asynchronous Learning Opportunities**
  The emergence of communications technology has resulted in the development of asynchronous communications opportunities (teleconferencing, microwave, satellite, courses delivered on the Web, desktop computing, cable TV) that have lowered the barriers to accessing many organizations around the world. With new means and diminishing barriers to communication, opportunities for outreach are enhanced as is the threat of having remotely located competitors reach our students. The world is operating at an increasingly rapid pace. The necessity for convenience, combined with the demand for quality, dictates that WPI participate in this arena, especially given our technological focus, to compete in the future.

- **Extension College**
  WPI must find a way to support a continuum of adult learning from continuing education to graduate education. The premise behind this recommendation is to bring our present Continuing Education operation to a higher level, comparable to that of a Harvard Extension School. In addition to providing non-credit professional development courses and programs, this entity could provide part-time undergraduate education to bring individuals to a level where they are prepared to enter graduate study. The establishment of an Extension College would enable WPI to satisfy the full range of educational and development needs of adult learners.

- **Undergraduate Research Participation**
  These awards would enable undergraduate students to work in a research laboratory during a summer. They would encourage our best students to pursue graduate studies. Those going to other institutions would help build
our reputation while some of these "best and brightest" would likely continue their studies at WPI.

- **Incubator/Entrepreneurs Collaborative**
  Funds would be provided to fund, in a venture sense, companies spun-off from WPI research. This extension of the successful undergraduate effort to the graduate level would prime the cycle of conversion of research to product realization.

- **Distance Learning**
  The infrastructure to support faculty emphasizing distance learning technology must be improved. WPI's studio and multimedia capabilities should be increased along with appropriate support staff.

**Other Recommendations**

- **Career Development Center**
  Infrastructure must be developed to support career development, graduate internships, and job placement for graduate students.

- **Culture**
  It is imperative that we continue to embrace graduate students and graduate programs as an integral component of the fabric of our community. We must find ways to help part-time graduate students develop a sense of community. Some specific actions include the development of critical masses in research groups, provision of office and meeting space, and development of social activities. The new International House is one positive step. We should seek to make Salisbury Gardens our graduate students residence.

**Preface**
WPI's graduate programs consist of two basic types; those which are research based and those which are practice oriented. We should strengthen those areas which are already good. Both types of program would benefit from less dependence on adjunct faculty, utilization of asynchronous delivery techniques and remote connections via picture tel. Graduate research programs must be built on a foundation of qualified graduate students supported by stipends and research opportunities. The greatest impact an individual faculty member can have is through the development of research proposals. Every department should clearly set forth its goals and an action plan for their accomplishment.

**Introduction**
The quality of graduate programs is the most important element of building a strong graduate program. In order to determine quality, assessment tools must be used and benchmarks established. In almost all cases, WPI's graduate programs need more students to ensure greater than critical mass and to enable better selectivity. Research oriented programs (approximately 40% of WPI graduate studies) need to be supported by more research grant funding. Practice-oriented programs (approximately 60% of graduate students) need to establish a competitive advantage. The university must work towards establishing a strong reputation in the graduate area.

Our graduate programs have a number of successful features: internships, pockets of success, attractive programs, recruiting system, remote campuses, corporate centers, and corporate outreach efforts. We need to build on these successes.

Our graduate programs have a number of features which must be improved. These include too many courses taught by adjuncts, not enough regular faculty, conflicts between day and evening schedules, not enough RA's, and lack of graduate housing.

It is important that the WPI community embrace the entire university academic cycle including discovery, assimilation, and organization of knowledge as well as its transmission.

**Historical Review**

There have been numerous studies and reports pertaining to graduate programs. They are listed herein for the record. Many of these reports point out that WPI is well positioned to offer strong practice-oriented degrees in addition to traditional research degrees.

- '69 President Storke appoints President’s Planning Group
- '69 Planning Report, "The Future of Two Towers"
- '69 Faculty Planning Committee Report: Future of Two Towers, Part IV, A Model
- '70 Faculty Planning Committee Report: Future of Two Towers, Part V, A Plan
Issues

WPI's graduate programs have typically been small and frequently depended on Teaching Assistants for a significant portion of their population. For many years, graduate programs were literally "evening programs" and were thought of as extra faculty load with professors being directly compensated on an overload basis. In recent years, many programs have evolved and become part of the everyday departmental activities. There has been a slow shift towards the Ph.D. as a major element of some programs. WPI was rewarded for this progress with a recommendation from Comprehensive to Doctoral on the Carnegie scheme.

New graduate programs have been developed so that a wide variety of research (thesis and dissertation) and non-research (professional practice) degrees are available. These programs are summarized in Table I.

Enrollments vary considerably by department and by funding source as shown in Table II. While some departments have reasonable numbers to sustain programs others have so few students that programs are barely viable. It is clear that most programs would benefit from increased numbers of students and increased financial support for students. Federal funding for research and development appears to be strong and WPI should focus efforts towards
gaining an increasing share. Industrial funding for WPI research could be significantly improved.

Competition and threat varies according to the type of program. Science and engineering programs compete with their counterparts in major research universities. The MBA program competes head to head with very strong programs in the region. Only FPE enjoys a monopoly. To succeed, graduate programs must have a competitive advantage. Typically, advantage relies on the reputation of faculty and stature of the program. It is clear that WPI must focus on the quality of its graduate programs.

Competition poses a number of threats. Distance learning through the use of technology may have the potential to significantly alter graduate education. By removing, at least to some extent, the geographic proximity requirement, far flung programs could become competitors. The NTU has been using video technology for many years, has an established structure, and is modestly successful. Course delivery using the World Wide Web holds great potential and seems to be catching on quickly at WPI and other universities. It is important to continue to explore course delivery technologies and to be prepared to move quickly when successful directions become evident.

Corporate degree programs appear to be gaining ground both in the form of tailored programs for delivery in-house and in the form of corporate based programs. To some extent, these programs reflect the frustration corporations feel with regard to the responsiveness of universities to address their perceived needs. In any case, it is clear that there is an industrial demand for practice-oriented degrees. On the other hand, many of these programs should be viewed as training programs rightfully conducted outside the educational environment. WPI has had significant successes delivering some of its programs directly to corporations. This activity should be increased and expanded to include more certificate and degree opportunities.

The reputation of WPI and its image in the eyes of many constituencies is strongly affected by the strength and accomplishments of graduate programs. Certainly other universities and their faculties form their opinions to a large extent on scholarly output. In schools of science and engineering, scholarly
output is critically dependent upon graduate programs. To a lesser extent, our reputation in the eyes of corporations, prospective students, and the general public is built on the accomplishments of graduate programs as well. The "Report of the Ad-hoc Committee on Reputation and Image Enhancement" (April 11 1996) shows there is great need to build our reputation and that graduate programs play a very important role in that process. WPI should do everything possible to strengthen and expand graduate programs thus building reputation.

The quality of WPI's graduate programs affects the ability of faculty to gain grant support, attract students, and recruit faculty. The recent National Research Council rankings as well as U.S. News and World Report rankings (of engineering) indicate that there is great room for improvement. It is imperative that WPI focus efforts on improving the quality of graduate programs.

Support systems for graduate students are important at a number of levels. Perhaps the highest priority ought to be the development of more financial packages (stipends and tuition) especially research assistantships and fellowships. Most graduate programs (Ph.D.) focus only on research and neglect the development of graduate students as teachers. WPI has a good start in this area and should build on this infrastructure and its renown for undergraduate teaching to produce Ph.D.'s who are not only excellent researchers but teachers as well. Practical improvements could easily be made on a number of fronts which would improve graduate programs. These include course scheduling, career development, and development of internships.

The intellectual and social culture of WPI has developed significantly in recent years but can be further improved. It is important that graduate students come to be viewed as an integral part of our university. Part-time graduate students must be included in our community. It is important that we think of the graduate student point of view when considering the academic and working calendars, facilities and availability, social functions, etc.
Facilities to serve graduate student needs are important. These include laboratories, common spaces, student center, offices, meeting rooms, and computer access.