SCANLON, JAMES J.

PROVOST

TO: FULL SERVICE FACULTY, ADMINISTRATION, AND STUDENT GOVERNMENT

FROM: PETER A. BALDINO, JR. CHAIRPERSON, ACADEMIC SENATE

RE; MEETING OF THE ACADEMIC SENATE
WEDNESDAY, APRIL 7, 1993 4:00 P.M.
ARTS & SCIENCES AUDITORIUM, ROOM 132, DEBARTOLO HALL

AGENDA

1. CALL TO ORDER.
2. APPROVAL OF MINUTES FOR MARCH 3, 1993 MEETING.
3. CHARTER AND BYLAWS COMMITTEE REPORT.
4. SENATE EXECUTIVE COMMITTEE REPORT.
5. ELECTIONS AND BALLOTING COMMITTEE REPORT.
6. REPORTS FROM OTHER SENATE COMMITTEES:
   923-5 UNIVERSITY CURRICULUM DIVISION COMMITTEE REPORT.
   923-6 INTEGRATED TECHNOLOGIES COMMITTEE REPORT.
7. UNFINISHED BUSINESS.
8. NEW BUSINESS:
   COMMENTS BY PROVOST JAMES SCANLON.
   COMMENTS BY MR. BILL BURLEY, PRESIDENT, STUDENT GOVERNMENT
9. ADJOURNMENT.

PLEASE NOTE:

THE MAY MEETING OF THE ACADEMIC SENATE WILL BE ON MAY 5, 1993 AT 4:00 P.M., ARTS & SCIENCES AUDITORIUM, ROOM 132, DEBARTOLO HALL.

COVER SHEET TO BE ATTACHED TO ALL REPORTS SUBMITTED TO THE ACADEMIC SENATE

Date 3/15/93 Report Number (For Senate Use Only) 923-5

Name of Committee Submitting Report University Curriculum Division

Committee Status: (elected chartered, appointed chartered, ad hoc, etc.)

Appointed Charter

Names of committee members: M. Gelfand, S. DeBlois, R. Foulkes M. Haggerty, H. Yiannaki, I. Heal, B. Bowers

Please write a brief summary of the report which the committee is submitting to the Senate: (attach complete report)

The following proposals have been approved by UCD and circulated through proper channels and there are no objections.

Do you anticipate making a formal motion relative to the report? No.

If so, state the motion:

If there are substantive changes made from the floor in your committee recommendation, would the committee prefer that the matter be sent back to committee for further consideration?

Other relevant date:

Madeleine Haggerty
Chair

93-012 Mechanical Engineering (Change)
781 Dynamic Systems Analysis
Theoretical study of the dynamics of linear lumped parameter models of mechanical, electrical, fluid, thermal, and mixed systems. Laplace transforms and input response concepts. Prereq.: MECH 641; MATH 705; ELEGR 714.

4 q.h.

93-013 Chemistry (Add)
860 Regulatory Aspects of Industrial Chemistry
Roles and responsibilities of industrial chemists. Industrial hygiene and safety. Industrial chemical processes, their waste products, their environmental effects, and the treatment of pollutants. Governmental regulations relating to waste disposal, product safety, occupational safety, resource conservation, environmental protection, and problems of awareness and compliance. Prereq.: CHEM 604 and 721.

2 q.h.

93-017 Art (Change)
860 Advanced Computer Graphics
Concentration on individual independent study in computer imagery. Encompasses both color systems and desktop publishing. Prereq.: ART 650 or permission of instructor. May be repeated for a maximum of 12 q.h.

1-4 q.h.

93-018 Engineering Technology (Change)
810 Manufacturing Systems Analysis
Study of manufacturing systems including process, design value analysis, manufacturing process analysis, selection, and sequencing; machine tool cost and functions, manufacturing economics, system characteristics, and post production analysis. Prereq.: METEC 700.

4 q.h.

93-019 Allied Health (Change)
704L Clinical Internship 1
Eighteen hours per week of practical application of skills in affiliate hospitals and private laboratories. Prereq.: Completion of previous five quarters of MLTEC curriculum with a grade of 'C' or better and a minimal 2.5 GPA.

3 q.h.

93-020 Allied Health (Change)
705L Clinical Internship 2
Thirty hours per week of practical application of skills in affiliate hospitals and private laboratories. Prereq.: Completion of the previous six quarters of MLTEC curriculum with a grade of 'C' or better and a minimal 2.5 GPA. Taken concurrently with MLTEC 706.
5 q.h.

93-021 Foreign Languages (Delete)
728 Rhetorical Theory
Selections from the works of a Roman rhetorical theorist (e.g., Cicero, Quintilian) with attention to matters of content. Grammatical review and composition. Prereq.: LATIN 602 or its equivalent.
4 q.h.

93-022 Chemistry (Add)
798 Undergraduate Seminar
The student will participate in departmental seminars and will present a seminar to the class. May be repeated once. Prereq. or concurrent: CHEM 603 and 720.
1 q.h.

93-023 Speech Communication and Theater (Change)
745 Individual Studies
The student selects a special problem or issue in communication to research in detail. Repeatable to a maximum of eight hours. Prereq.: SPCH 530 or 640 or Junior standing in Speech Communication; acceptance of Individual Study Proposal Form by coordinating faculty and department chair.
1-4 q.h.

93-033 Art (Change)
880 Photography 6
Selected technical and aesthetic photographic problems to enrich the student's abilities and knowledge of photography. May be repeated for a maximum of 10 q.h. credit. Eight hours of lab. Prereq.: ART 784 and acceptance of photo portfolio by instructor.
5-10 q.h.

93-034 Mathematical and Computer Sciences (Add)
683 Transition to Advanced Mathematics
A course to prepare mathematics majors for their later theoretical courses. Topics will include logic, sets, and methods of proof including mathematical induction. Recommended to be taken concurrently with Math 673. Prereq.: MATH 572.
2 q.h.

93-035 Mathematical and Computer Sciences (Change)
721,722 Abstract Algebra 1, 2
Algebra of sets, relations and functions; elementary group theory; rings, domains; and supportive material from number theory. Prereq.: MATH 683 and 725 for 721, 721 for 722.

3+3 q.h.

93-036 Mathematical and Computer Sciences (Change)
751, 752 Intermediate Real Analysis 1, 2
Elementary logic, properties of the real number system, critical analysis of limits and continuity, fundamental concepts underlying the calculus. Prereq.: MATH 673 and 683 for 751, 751 for 752.

3+3 q.h.

93-037 Mathematical and Computer Sciences (Add)
585H, Calculus 1, 2, 3 Honors
586H, A sequence of honors courses in analytical geometry and
687H. calculus which will cover essentially the same material as Math 571, 572, 673 and 674, in three quarters instead of four. A detailed study of limits, derivatives, and integrals of functions of one and several variable and their applications. Prereq.: four high school units of mathematics (including trigonometry) with an "A" or high "B" average and a high score on the ACT or CEEB examination are required for Math 585H. 585H is required for 586H and 586H is required for 687H. This sequence will be offered at most once during each academic year.

5+5+5 q.h.

93-038 Mathematical and Computer Sciences (Delete)
571H, Calculus 1, 2, 3, 4 Honors
572H, A sequence of honors courses in analytical geometry
673H, and calculus with more emphasis on rigor than the
674H. MATH 571, 572, 673, 674 sequence provides. A detailed study of limits, derivatives, and integrals of functions of one and several variables and their applications. Especially recommended for Mathematics majors who can qualify. Prereq.: four high school units of mathematics (including trigonometry) with an "A" or a high "B" average and a high score on the ACT or CEEB examination are required for Honors Calculus 571H. 571H is required for 572H. 572H is required for 673H and 673H is required for 674H.

5+4+5+4 q.h.

93-039 Foreign Languages (Change)
615 Intermediate Spanish Readings
Intensive reading of a wide variety of 20th century texts including literature, essays, film scripts, journalistic and scholarly writing, designed to improve students' reading and interpretive skills in Spanish. Prereq.: Spanish 602 or equivalent or permission of instructor.
4 q.h.

93-040 Foreign Languages (Add)
752 Spanish Civilization and Culture I: Origins to 1700
The development of the civilization of Spain (including Basque, Catalan, and Galician culture) from its origins to the end of the Golden Age as revealed in the literature, art, social and economic organization, folklore, crafts, and music characteristic of the period. Prereq.: Spanish 615 or equivalent or permission of instructor.
4 q.h.

93-041 Foreign Languages (Add)
753 Spanish Civilization and Culture II: 1700-1931
The development of the civilization of Spain (including Basque, Catalan, and Galician culture) from the beginning of the Bourbon dynasty to the Second Republic as revealed in literature, art, social and economic organization, folklore, crafts, and music characteristic of the period. Prereq.: Spanish 615 or equivalent or permission of instructor.
4 q.h.

93-042 Foreign Languages (Add)
754 Spanish Civilization and Culture III: 1931 to Present
The contemporary civilization of Spain (including Basque, Catalan, and Galician culture) with emphasis on the period since 1975. Includes an examination of the literature, art, social and economic organization, music, and popular culture of the era. Prereq.: Spanish 615 or equivalent or permission of the instructor.
4 q.h.

93-043 Foreign Languages (Delete)
705,706 Survey of Spanish Literature
Introduction to the principle works, writers, and literary movements. SPAN 705: to 1700; SPAN 705: since 1700. Prereq.: SPAN 615 or permission of instructor.
4+5 q.h.

93-044 Foreign Languages (Delete)
750 Spanish Civilization
A survey of Spanish culture: the ideas, attitudes, and values definitive of the Spanish character. Class discussion in Spanish. Prereq.: SPAN 602.
4 q.h.

93-045 Foreign Languages (Delete)
805 Topics in Spanish Literature of the Golden Age
The study of major works of prose, poetry and/or drama between 1492-1680, focusing on one of the following: literary movements, themes, specific authors, or other comparable areas of interest. May be taken three times if topic is different. Prereq.: SPAN 615 and one 700-level Spanish course.
4 q.h.

93-046 Foreign Languages (Delete)
816 Topics in Nineteenth Century Spanish Literature
The study of major works of 19th century prose, poetry and/or drama focusing on one of the following: literary movements, themes, specific authors, or other comparable areas of interest. May be taken three times if topic if different. Prereq.: SPAN 615 and one 700-level Spanish course.
4 q.h.

93-047 Foreign Languages (Delete)
825 Topics in Twentieth Century Spanish Literature
The study of major works of 20th century prose, poetry and/or drama focusing on one of the following: literary movements, themes, specific authors, or other comparable areas of interest. May be taken three times if topic is different. Prereq.: SPAN 615 and one 700-level Spanish course.
4 q.h.

93-048 Foreign Languages (Delete)
830 Selected Topics in Hispanic Literature in the United States
The study of major 20th century literary works in Spanish by authors from one or more of these groups; Mexican-Americans, Puerto Ricans, Cubans, and other Hispanic groups. May be taken twice if topics are different. Prereq.: SPAN 615 and one 700-level Spanish course, or consent of instructor.
4 q.h.

93-049 Foreign Languages (Delete)
718,719 Survey of Spanish-American Literature
Similar to 705, 706 but for Spanish-American literature. SPAN 718: From the beginnings to "Modernismo" (19th Century). SPAN 719: From "Modernismo" to the present. Prereq.: SPAN 615 or permission of the instructor.
4+4 q.h.

93-050 Foreign Languages (Delete)
725,726 Grammar Review and Composition
A review of Spanish grammar through analysis of stylistic devices of literary works and through exercises, translation, and original composition. Prereq.: SPAN 602 or equivalent.

4+4 q.h.

93-051 Foreign Languages (Add)
870 Topics in Spanish Literature
Study of an author, a genre, or a movement in Spanish literature from 1492 to the present. The topic will be announced each time the course is offered. May be taken three times if content is not repeated. Prereq.: Spanish 615 plus one 700-level course or equivalent or permission of the instructor.

4 q.h.

93-052 Foreign Languages (Add)
890 Topics in Latin America Literature
Study of a movement, a genre or an author in Latin America from 1492 to the present. The topic will be announced each time the course is offered. May be taken three times if content is not repeated. Prereq.: SPAN 615 plus one 700-level course or equivalent or permission of the instructor.

4 q.h.

93-053 Foreign Languages (Change)
655 Spanish Conversation I
Techniques of oral expression to develop fluency and accuracy. Practical strategies to help students communicate effectively in a variety of social contexts. Listening comprehension, pronunciation drills, functional vocabulary. Laboratory practice. Prereq.: SPAN 602 or equivalent or permission of instructor.

4 q.h.

93-054 Foreign Languages (Add)
755 Spanish Conversation II
Development of oral expression through discussion of current topics in the context of world-wide Hispanic culture, politics, and economics. Expansion of vocabulary. Laboratory work according to individual needs. Prereq.: SPAN 655 or equivalent or permission of instructor.

4 q.h.

93-055 Foreign Languages (Add)
735 Spanish Grammar I

A review of Spanish grammar through written and oral exercises, description and analysis of morphological topics, with emphasis on noun and verb systems. Discussion of contrasts with English and effective use of grammatical rules. Prereq.: SPAN 615 or equivalent or permission of instructor.

4 q.h.

93-056 Foreign Languages (Add)
736 Spanish Grammar II

A review of Spanish grammar through written and oral exercises, description and analysis of syntactical topics, with emphasis on pronoun system, word order, as well as sentence formation and combination. Discussion of contrasts with English and effective use of grammatical rules. Prereq.: SPAN 735 or equivalent or permission of instructor.

4 q.h.

93-057 Foreign Languages (Add)
737 Spanish Composition

Development of techniques of writing Spanish prose through composition exercises, summaries, letters, essays, reports, papers. Prereq.: SPAN 736 or equivalent or permission of instructor.

4 q.h.

93-058 Foreign Languages (Add)
729 Vergil's **Aeneid** I

An introduction to the Aeneid based on a reading of the whole poem in English and of significant passages from Books 1-6 in Latin, with attention to style and content. Prereq.: Latin 602.

4 q.h.

93-059 Foreign Languages (Add)
829 Vergil's **Aeneid** II

A continuation of Latin 729 concentrating on reading significant passages of Books 7-12 in Latin and examination of relevant scholarly studies of the poem. Prereq.: Latin 729.

4 q.h.

93-060 Foreign Languages (Delete)
809 Virgil's Aeneid

A study of the Aeneid based on a reading of the whole poem in English and of significant passages in Latin, with attention to style and method as well as to content. Prereq.: Any 700-level Latin course.

4 q.h.

93-06? Human Performance and Exercise Science (Change)
537 Aquatic Exercise
Fitness through aquatic conditioning exercises tailored to the individual needs of the student. Open to swimmers and non-swimmers.

1 q.h.

93-008 Business Education and Technology (Change)
523 Intermediate Typewriting/Keyboarding
Business lettere, manuscripts, and business reports. Taught on microcomputers and electronic typewriters. Two hours of lecture, two hours of laboratory. Prereq.: OSA 520 or equivalent.

3 q.h.

93-007 Business Education and Technology (Change)
623 Advanced Typewriting/Keyboarding
Typing problems including specialized applications will be covered. Taught on microcomputers and electronic typewriters. Two hours of lecture, two hours of laboratory. Prereq.: OSA 523.

3 q.h.

COVER SHEET TO BE ATTACHED TO ALL REPORTS SUBMITTED TO THE ACADEMIC SENATE

Date 3/17/93 Report Number (For Senate Use Only) 923-6

Name of Committee Submitting Report Integrated Technologies Committee

Committee Status: (elected chartered, appointed chartered, ad hoc, etc.)

appointed chartered

Names of Committee members: S. Ausmann, J. Butler, T. Doctor, D. Genaway, R. Goldthwait, R. Hogue (Chair), F. Jackson, G. Kudav, P. McCarthy, H. Pullman, J. Reid, E. Usip, J. Woodall

Please write a brief summary of the report which the Committee is submitting to the Senate: (attach complete report) Recommendations concerning the future of integrated instructional technologies at YSU.

Do you anticipate making a formal motion relative to the report? No

If so, state the motion:

If there are substantive changes made from the floor in your committee recommendation, would the committee prefer that the matter be sent back to committee for further consideration? Yes

Other relevant data:

Robert A. Hogue

Chair

INTEGRATED TECHNOLOGIES COMMITTEE

REPORT TO THE ACADEMIC SENATE

SPRING 1993

This document contains the opinions and recommendations of the Integrated Technologies Committee concerning the present status of instructional technology at YSU and the future course that should be taken in planning for and implementing enhancements to these technologies.

Table of Contents:

Integrated Technologies Committee
Report to the Academic Senate

Spring 1993

1. Instructional Media and Technology:

BACKGROUND:

The advances in recent years in various areas of instructional technology have been significant. More and more courses are taking advantage of the use of such technologies as satellite video feeds, video tape and film libraries, audio/visual materials, computer-based instruction, and multimedia presentations. Ideally, every classroom on campus should be equipped with the capability of using at least some of these technologies. Not all classrooms necessarily require the same technology, but such features as network-accessible video and audio, big-screen projection, and access to computer systems and library services should be considered.

While standard lecture sessions are likely to remain as a fundamental element of many courses, there should be an increased availability of instructional technology for those faculty interested in using it, and at the same time there should be increased faculty interest in exploring the uses of this technology in their classrooms.

RECOMMENDATIONS:

1. Equipping classrooms with facilities for instructional media should be considered each time a classroom is scheduled for renovation or modification. Any plans for constructing new classroom buildings must include full and flexible access to instructional technologies. Access to a consolidated campus network (see #2 below) is essential for delivery of many of these technologies.

2. Network access should also be provided for such library services as an online catalog, CD-ROM databases, and electronic document delivery.

3. Faculty development seminars should be conducted to inform faculty members of the available technologies and to describe procedures for requesting and using these facilities. Faculty

and staff in a variety of disciplines are already using some elements of this technology, and these individuals should be invited to share some of their expertise and experience by leading or taking part in these seminars.

2. Campus-wide Networking:

BACKGROUND:

A critical part of the effective distribution of instructional technologies is the creation of a campus-wide information network. It is through such a network that the delivery of audio, video, voice, facsimile, and other data can best be accomplished. Communicating between and among computers, workstations, and terminals can also be a part of such a network. This network could link faculty and staff offices, classrooms, dormitories, the library, the media center, and other appropriate areas on campus.

Fiber optic technology, although not inexpensive, is recommended for the principal transmission paths, due to its low noise, high bandwidth, and high reliability.

One excellent example of a campus-wide network can be found not far from YSU: The campus fiber optic network installed at Case Western Reserve University has been an ambitious and farsighted project that has brought the fiber optic connection not just into a building or onto a floor, but into each room where it is needed. Thus, each classroom, office, and dormitory room has a standard method for linking into the world of instructional technology.

RECOMMENDATIONS:

1. All current and future plans for establishing communications networks on campus should make the maximum possible use of fiber optic technology.

2. This network should provide the capability of interconnections for electronic mail, computer networks, instructional media, the campus telephone network, and the university library.

3. Because of the scope and success of the Case Western network, YSU should create a team of employees, including administration, staff, and faculty, to visit Case Western for a closeup look at their network. This team should investigate the costs, problems, benefits, and overall satisfaction with this network and should submit a report to the YSU administration regarding their findings and recommendations.

3. Involvement of Campus Expertise:

BACKGROUND:

The planning and supervision of instructional facilities on campus has sometimes taken place without including members of the staff or faculty who have knowledge and interest in these areas. The input of such individuals can be a valuable resource for these efforts and can help save the extra time and money needed to reverse-engineer a project after the fact. (For example, the Director of the Computer Center has not been contacted at all concerning the plans for construction of the new Education building.)

One of the common laments of project workers is that, from the standpoint those leading the project, "There's never enough time to do it right, but there's always enough time to do it over." This is regrettable even in good economic times, but there simply is no place for such oversights when our funds for these projects are so limited to begin with.

As YSU begins to employ more instructional technology, it seems very likely that new and renovated facilities will have an increased need for access to these technologies, and this makes it even more important for the university to consult with its resident expertise in these areas.

RECOMMENDATIONS:

1. The Director of the Computer Center and the Director of Media Services should automatically be appointed to any planning group for new or renovated instructional facilities as soon as the planning group is established. These two

individuals should be invited to serve on such planning teams, or alternatively, to appoint another person to serve in their place. This should include planning groups established under the Campus 2000 plan.

2. Similarly, the Integrated Technologies Committee should be contacted when planning teams are established. The ITC should be invited to recommend one or two people (not necessarily members of the ITC) to such planning teams.

3. The Executive Committee of the Academic Senate should consider including one faculty member from Computer and Information Sciences among the faculty appointed to the Integrated Technologies Committee.

4. With the advent of increased use of computers as part of an overall instructional technology campaign, the segment of the computer center staff currently known as Academic Computing should continue to be recognized as a crucial resource for faculty and students who are engaged in the use of this equipment. Administrative computing is, of course, still essential. But the needs of the academic sector of the university are sufficiently different that Academic Computing should retain its identity. Indeed, it seems likely that an increase in computer and technology use in the academic sector will require the consideration of staffing increases in this area.

4. Upgrading of Microcomputer Hardware and Software:

BACKGROUND:

Both as a platform for computer-based instruction and as a general productivity tool, microcomputers have enjoyed an increasing popularity and utility among students, faculty, and staff.

Unfortunately, as discussed in the Computer Services Committee report of May 6, 1992, the state of YSU's microcomputer hardware is abysmal. Some relatively isolated clusters of more modern equipment do exist (some departmental labs, for example). However,

despite the addition of 30 new 80486-based machines, most of the publicly-accessible microcomputer equipment in Meshel Hall is hopelessly antiquated. Many of the machines were manufactured as early as 1982. In terms of computer technology, ten-year-old machines are so outdated as to be practically unusable.

Many of today's microcomputer software products are so large and resource-consuming that any attempt to run them with 1986-vintage PC's will be disappointing at best. In fact, any application requiring Microsoft Windows simply will not run on the machines at all.

Microcomputers are not the only problem. The dot matrix printers in the public labs in Meshel Hall have become worn and unreliable. It is not uncommon to find several of the units inoperative. On at least one occasion last year, there was only <u>one</u> working PC lab printer in all of Meshel Hall.

The age, maintenance problems, and slow performance of these machines have moved beyond the level of inconvenience and into the level of absolute frustration. What should be an important example of instructional technology has instead turned into an impediment to education. We serve students poorly, if at all, by continuing to use hardware that is more appropriate for a museum.

It is a sorry commentary when, as noted in last year's Computer Services Committee report, many students have access to much more modern equipment at home or at work than what they are paying to use at YSU.

RECOMMENDATIONS:

1. The replacement of the IBM PC/XT machines in the microcomputer labs in Meshel Hall is absolutely essential if YSU hopes to be a competitive institution of higher education. The presence of this hardware is a source of frustration for the users and downright ridicule from the outside community.

2. The replacement should involve PC's having at least an 80486 central processing unit, color display, hard disk, and Windows or a similar graphical user interface available.

3. Although an exhaustive list of all desired software is probably not practical, the university should address the need for a broad range of microcomputer software written for use with a graphical user interface. Such packages as word processing, desktop publishing, business graphics, statistics, full-featured spreadsheets, and language compilers need to be considered for the public PC labs. Individual departments may also have special software needs (graphic arts, MIDI capabilities for music, etc.)

4. The current dot matrix printers in the Meshel Hall labs should be replaced with newer, near-letter-quality printers. In order to support high-quality graphics and landscape output, laser or bubble-jet printing should also be made more available, although it is recognized that a reasonable charge may be necessary for laser output.

5. How to Fund These Technologies:

BACKGROUND:

The technology enhancements recommended in this report will not be inexpensive, and this committee makes these recommendations with the full awareness that bringing YSU into a competitive position in these areas could be costly. However, the alternative is a continuation of outdated technologies and the reputation that will inevitably accompany such apparent neglect.

In better economic times, there might have been many ways to help fund these changes. In today's economic and political climate, we have fewer choices.

One choice that seems unworthy of continued use is the present system of applying materials fees to selected "computer" courses. This system has been found to be very inconsistent and unfair. For example, it is quite possible for a student paying a $20 materials fee to be working at a terminal next to a student enrolled in a course which is not subject to the fee. One student pays; the other does not. But both are using the

computer. It is no wonder that students have protested this inequitable fee assessment.

A universal fee to help cover the general computer usage of the entire student population should be given very serious consideration. While a recommendation for an additional fee will be unpopular with some, it seems to be the fairest way to fund the necessary improvements in our technological services while at the same time recognizing that these technologies are actually of benefit to all students, not only those taking a certain set of courses.

At the same time, opportunities for funding from grants and other external sources should be aggressively investigated.

RECOMMENDATIONS:

1. In place of the $20 materials fee, the university should impose a universal Technology Fee of $1 per credit per student per term. This fee would be assessed to all students, regardless of major. A universal fee is felt to be fairer than the uneven and confusing method of "materials" fees for courses, for the following reasons:

   a. It is very difficult to determine which courses are "technology" courses and which are not, since any course can make use of instructional technology if the faculty member teaching the course decides to use it.

   b. A universal fee would remove the punitive stigma placed on courses which do use instructional technology.

   c. Perhaps most importantly, it recognizes instructional technology as a university-wide resource, a subset of instructional technology which is (and should continue to be) available to all students for their course work and for their overall academic experience.

2. All funds generated by this fee should be earmarked for only the following areas:

a. instructional technologies, including library access, video production facilities, photo and graphic productions, audio and video delivery systems, equipment for satellite programming, and academic computing hardware and software.

b. campus-wide networking and related costs.

3. If the universal fee cannot be implemented due to funding caps imposed by the state, then consideration should be given to tapping into the current General Fee for this funding.

4. If neither ~~#3~~ #1 nor ~~#4~~ #3 can be implemented, then there should be an investigation of a <u>fair</u> method for applying lab fees or materials fees to individual courses for computer usage. However, any such course-by-course system should be implemented only in light of the following considerations:

   a. Faculty input is essential in order to determine which courses use instructional technology, and to what degree.

   b. The funds received from this fee must be earmarked to be returned to the area whose equipment is actually being used.

   c. If the course-by-course system is implemented, controls must be put into place to insure that students who are taking a course that is not assessed an extra fee may not use the same equipment as those students who have been charged a fee.

5. In all segments of the university, there should be renewed emphasis on the importance of seeking grants for funding or equipment or both. The time needed to research, write, and monitor grants can be significant, and employees who engage in grants efforts should be given fair consideration for release time in conjunction with these activities.

6. Commitment of the University Community:

BACKGROUND:

All of the greatest technology available will be of little benefit if the members of the university community ignore this resource and continue to do their jobs the same way that they have been doing them for the last 20 years or more. Some faculty members are already active participants in various networks and computer systems on campus. Some are also making use of new video and audio technologies in the classroom. Some staff members are also active in this area and have been encouraging increased involvement by all.

What is needed, in addition to the nuts-and-bolts items for instructional technology, is a commitment by more members of the university community toward modernizing and improving the instructional, administrative, and research services that YSU provides. This commitment involves not just support for the acquisition of new hardware, but an overall interest in, and participation in, the vast informational network that could be established on this campus in the coming years.

We need a cadre of "true believers" on this campus: people who not only talk about and promote the use of this technology, but who actually use it extensively in the performance of their jobs.

RECOMMENDATIONS:

1. The university should be doing far more to encourage the use of electronic mail instead of paper correspondence. Not only would this set an example for the productive use of technology, it could also help reduce paper and reproduction costs. It could significantly reduce the time needed to "get the word out" to the campus. Examples of items which could be sent electronically are:

   a. meeting announcements.

   b. special events announcements.

   c. YSUpdate.

   d. class rosters.

e. other materials which are not confidential, sensitive, or of a legal nature.

2. For such an electronic mail system to be worthwhile, there must be much more widespread access to, and use of, at least one computer system by the following:

   a. every faculty member who does not now have an account.

   b. top levels of administration, including the President, Provost, and college Deans.

   c. senior staff members.

   It is recognized that not all faculty and staff currently have access to a computer terminal or networked microcomputer from which they could use electronic mail. It is possible that some of the current equipment in Meshel Hall could be reallocated to other departments for this purpose and at minimal cost.

3. To encourage and facilitate the use of electronic mail, an individual's account ID should be published in the campus telephone directory along with the user's phone number. (This was also one of the recommendations of the Computer Services Committee as part of the Strategic Planning process.)

4. If and when a universal Technology Fee is assessed, every student who is enrolled at YSU should automatically receive a permanent account on at least one computer system. This account should provide for permanent disk storage (unlike the current shared library system on the mainframe). However, it should be recognized that this policy will not come without a price:

   a. Permanent disk storage for approximately 15,000 students will require significant extra resources, and this additional disk storage will cost money.

   b. Depending on the amount of student usage, additional terminals and other equipment could be required.

c. The universal Technology Fee recommended above could be used to help offset these expenses.

Summary:

At one time, the use of technology in education was thought to be the special, private concern of a handful of disciplines such as mathematics and natural sciences. Later, the power, flexibility, and availability of instructional technologies opened the field to virtually any discipline. Today, the state of these technologies combined with their increasing use by institutions of higher education makes it not just desirable, but imperative, that YSU make significant advances in this area.

The recommendations in this report can not all be implemented overnight, nor at a small cost. However, it is time for the university and its employees to recognize the importance of obtaining and using these technologies, not because they are trendy or faddish, but because they are considered a standard part of today's educational environment.

All of us -- administration, faculty, staff, and students -- can be a part of this effort. And if it is to succeed, all of us must be.

We invite, we encourage, we challenge the university community to begin bringing us into the age of educational technology.

SCANLON, JAMES J.

PROVOST

TO: FULL SERVICE FACULTY, ADMINISTRATION, AND STUDENT GOVERNMENT

FROM: PETER A. BALDINO, JR. CHAIRPERSON, ACADEMIC SENATE

RE: ADDITIONAL AGENDA ITEM FOR MEETING OF APRIL 7, 1993

The attached report from the Academic Programs Committee of the Academic Senate was not received in time for the mailing of the agenda. However, because there are important reasons to have this matter considered at the April meeting, I am sending you this material under separate cover at this time. Please understand that no vote on this matter will be taken until the May meeting of the Senate. However, an already crowded May agenda would be relieved considerably if we had some preliminary and, perhaps, complete discussion of this matter at our April meeting.

Thank you for your understanding the need for consideration of this matter at this time.

COVER SHEET TO BE ATTACHED TO ALL REPORTS SUBMITTED TO THE ACADEMIC SENATE

Date 3-3-93 Report Number (For Senate Use Only) 923-7

Name of Committee Submitting Report Academic Programs

Committee Status: (elected chartered, appointed chartered, ad hoc, etc.) appointed chartered

Names of Committee members: J. Allshouse, M. DeLost, J. Gill-Wigel, R. Jones, R. Krishnan, T. Lambert, D. Mincey, A. Owens, G. Sutton

Please write a brief summary of the report which the Committee is submitting to the Senate: (attach complete report)

The Programs Com mittee recommends the program changes proposed by the Civil Engineering Department. These changes inlcude a name change to Civil and Enviornmental Engineering and several new courses for choosing a Civil Engineering emphasis.

Do you anticipate making a formal motion relative to the report? No

If so, state the motion: Change name of Civil Engineering to Civil and Environmental Engineering with approved course changes.

If there are substantive changes made from the floor in your committee recommendation, would the committee prefer that the matter be sent back to committee for further consideration? yes

Other relevant data: attached

Chair

YSU

Youngstown State University / Youngstown, Ohio 44555-3027
The William Rayen School of Engineering
Department of Civil Engineering
(216) 742-3027

To: Daryl W. Mincey, Chair
Academic Programs Committee

From: J. D. Bakos, Jr., Chair
Civil Engineering

Date: December 4, 1992

Subject: Civil Engineering Program Change

Attached you will find the necessary documentation to support our request for a program change in our undergraduate Civil Engineering Program, as well as a request to change the name of the department. As you are probably aware, the plan to rename the department from the Department of Civil Engineering to the Department of Civil and Environmental Engineering has received widespread notice since it was included in President Cochran's Academic Reorganization Plan. The department has met with the President to discuss these proposed changes and has received his approval.

Since our program change includes adding or dropping of courses offered by other departments, supporting statements have been included. All of the departments involved, except Physics, have supported our proposed changes. Under our proposal, we plan to drop Physics 610 for only those students within our program who opt to specialize in Environmental Engineering. Physics 610 is not a prerequisite for any other course in our program and thus, the ripple effect from its elimination will be minimal. In addition, the program for those students opting to specialize in Environmental Engineering will still satisfy the basic science requirements as imposed by our accrediting agency, ABET. While we feel that the objection put forth by the Physics Department to our changes is well intentioned, the Civil Engineering faculty is in the best position to determine what is best for our students and the profession. Furthermore, since the proposed changes are in compliance with our accrediting agency's requirements, we are requesting that they be approved despite Physics' objection.

Should you have any questions concerning our proposal, do not hesitate to call on me for further assistance and/or information.

Addition of a new program_____(Complete B, C)

Deletion of an existing program_____(Complete A, C)

Change in an existing program X (Complete A, B, C)

Program title CE Undegraduate Program Department Civil Engineering

A. Describe the requirements of the program as it currently exists. (Attach additional sheets if necessary.)

The Civil Engineering Department currently offers a broad based, accredited (ABET) undergraduate program that prepares its graduates for entry level positions in the professional work arena or for continued educational pursuits through graduate school. Limited elective opportunities currently exist for students to specialize in one of three subdisciplines in Civil Engineering: namely, structural, transportation, or environmental engineering.

B. Describe the requirements of the proposed program. (Attach additional sheets if necessary.)

The department proposes to change its name from the Department of Civil Engineering to the Department of Civil and Environmental Engineering in order to more adequately meet the changing needs of the profession and marketplace as well as to meet the increase in student demands for an expanded emphasis in environmental engineering. Secondly, selected course options within the program will be provided to allow an increased environmental emphasis. Proposed changes will also permit a slight increased emphasis in the other civil engineering specialty areas.

C. Using as many additional sheets as are necessary, provide a rationale and estimate how this addition/deletion/change of program will impact upon the resources of departments other than the one originating the form (e.g. enrollments, frequency of support-course offerings, staffing, budgets, equipment, duplicate courses, etc.).

(See attached sheets.)

D. IF THE PROPOSAL INCLUDES ADDING OR DROPPING COURSES OFFERED BY OTHER DEPARTMENTS, SUPPORTING STATEMENTS FROM THESE DEPARTMENTS MUST BE INCLUDED WITH THE REQUEST.

Signatures

Department Chairperson

Dean Prog. Div.

Senate

Attachment to CE Undegraduate, Civil Engineering Department Program Change

Part C: Justification/Rationale

There is an unprecedented growth in the "Environmental Market" and in a demand of that market for resources, products, and educated personnel. Originally, education of the environmental engineering professional was focused on the graduate level and emphasized water and wastewater engineering. However, in view of the growth in size and complexity of the markets served by the current program, it is appropriate that the benefits to be gained from an increased emphasis on a baccalaureate environmental engineering option be closely examined.

The current approach to environmental engineering education is to produce "mongrels", not "purebreds", for practice in environmental engineering. For example, a graduate in civil engineering has been known to begin a career in structural engineering and later decide to move into the environmental field. Such a move is quite feasible and, in fact, happens quite often especially in view of the current interest and emphasis on the environment. Thus, there is a need to ensure that civil engineers entering the environmental work force are well grounded in the fundamental principles and that they can apply these principles to the solution of multimedia problems. Baccalaureate civil engineering programs emphasizing the breadth and depth of environmental engineering would be a significant step in the right direction. On the other hand, for a student who obtains a

Bachelor of Engineering Degree in a narrow discipline such as environmental engineering, the feasibility of a career change into structural engineering or any of the other subspecialties associated with civil engineering is not likely. Therefore, the introduction of an expanded option in environmental engineering should be coupled with a program that would allow the graduate choosing this specialty to move into other work areas should the market change in future years. The expanded environmental option must also meet current ABET accreditation guidelines. Finally, these students would need to be academically prepared to pass the examinations associated with the professional registration (licensing) process. The proposal to alter the existing program incorporates all these considerations.

Under the proposal, students selecting the civil environmental engineering option would basically follow a common civil engineering curriculum for the first two years. This would provide the student with fundamental engineering, mathematics, humanities/social science, oral/written communication, and basic science course work so that he/she would obtain a greater understanding and intellectual maturity before they would opt to specialize, e.g., in environmental engineering. The student would then continue in a traditional civil engineering program with an additional option of choosing to concentrate or specialize in transportation, environmental, or structural engineering. These options, however, would still be within the framework of a broad based civil engineering education. The

student opting to specialize in environmental engineering, however, would have an opportunity to take an even more expanded number of courses related to the environmental engineering area. These would include course work in the traditional water and wastewater treatment, hydrology, water quality analysis, solid and hazardous wastes, design of water and wastewater distribution systems, industrial pollution control, and an expanded number of courses in the basic science area.

Specific Changes

Changing the name of the department from the "Department of Civil Engineering" to the "Department of Civil and Environmental Engineering" gives the message to potential students that the program is indeed geared to emphasize environmental engineering. This will not only send a message to potential students, but will also set the tone for future research proposals and endeavors to indicate that the program is indeed serious about its commitment to environmental matters.

Along with the name change will be the opportunity for all civil engineering students to increase course work within their chosen field of specialty. While this increased specialization opportunity is not as extensive within the areas of transportation and structural engineering, the unique multimedia characteristics of environmental engineering requires that a significant change must occur for those students opting for this area. Currently, each student in the program is given an

opportunity to take two selective courses within their area of specialization. Under the proposed change, students opting to take the environmental engineering option will have the opportunity to take five additional environmentally related civil engineering classes. This occurs after taking a basic environmental engineering class which is required of all Civil Engineering undegraduate students. These five courses will cover a wide range of environmental topics to include water quality, surface run-off, wastewater and water treatment, design of water and wastewater distribution systems, and toxic and hazardous wastes. In addition, environmental students will also be required to take Chemical Engineering 820 (Industrial Pollution Control). Because environmental engineering requires such an intensive background in the basic sciences, the basic science requirement for environmental majors will be increased from 24 to 28 quarter hours. This includes adding an additional general chemistry class which will give environmental students a full year of chemistry. In addition to requiring Physics 510 (General Physics I) and Geology 611 (Geology for Engineers), the option also requires students to take an additional two course sequence either in biological sciences or chemistry or geology, all of which are courses that are environmentally related. Finally, students will be required to take Math 743 (Mathematical Statistics I) in place of a mathematics elective in order to provide the students with a much needed statistical background.

Within the other specialties of civil engineering, namely, transportation and structural engineering, the students are currently permitted to take two additional selective courses within their chosen area of concentration. Under the new proposal, students will have an opportunity to take three courses within their area of specialty. In addition, these students will also be required to take Math 743 (Mathematical Statistics I) in lieu of a mathematics elective since a fundamental background in statistics is a program requirement that is currently being encouraged by our accrediting agency (ABET).

All of the proposed changes are aimed at increasing the intensity within an area of concentration and will only involve the deletion of two out-of-department courses from the existing program. First, Chemical Engineering 681 (Industrial Stoichiometry) will be dropped. For environmental majors this course will be replaced with Chemical Engineering 830 (Industrial Pollution Control), thereby, producing no net change for the Chemical Engineering Department. For those opting to specialize in transportation and structural engineering, however, Chemical Engineering 681 will be replaced with the additional specialization course referred to earlier. It should be noted that during our last ABET accreditation visit, our departmental visitor strongly suggested that Chemical Engineering 681 be dropped from the program, and, thus, this deletion would have taken place even if the proposed program change did not come about. For environmental students only, the proposal is to drop

Physics 610 (General Physics II) and replace it with Chemistry 517 which will then provide environmental students with a full year of chemistry. Physics 610 is not a prerequisite for any other course in the current program, and, thus, there would be no ripple effect should this course be deleted. Current EAC/ABET basic science requirements include general chemistry and general physics at an "appropriate" level. This is interpreted as calculus-based physics and chemistry beyond the high school level. There is a minimum requirement of a two semester (or equivalent) sequence of study in **either** area. EAC/ABET expects some course work in the basic sciences to also include or be complemented by laboratory work. The three course sequence in chemistry within the proposed environmental option satisfies the minimum requirement of one year of study in either chemistry or physics. Keeping Physics 510 in the curriculum provides the prerequisite for several courses within the current course requirements. The laboratoray work in the three required chemistry classes and the required geology class meets the laboratory requirement in the basic science area. In addition, for environmental students, a stronger background in chemistry, biology, and geology is more beneficial to those opting to select this area.

For those not choosing the environmental area, the EAC/ABET minimum one year requirement in either chemistry or physics will also be accomplished. All students are required to take Chemistry 515 and 516 as well as Physics 510 and 610. These

individuals must also select a four hour basic science elective. Choices for this elective will be limited to either Chemistry 517 or Physics 611. This will require the nonenvironmental students to have one year of either chemistry or physics depending upon their choice of the basic science elective.

A tabular breakdown of these specific changes is presented as follows on the next page:

ENVIRONMENTAL ENGINEERING OPTION

Current Requirement		Proposed Requirement	
CE Design Elective	4 q.h.	CE 883 Design of Water and Wastewater Systems	4 q.h.
CE Engineering Sci. Elective	4 q.h.	CE 751 Water Quality Analysis	4 q.h.
CE 882 Soil & Foundation Engineering	4 q.h.	CE 888 Solid & Hazardous Waste Management	4 q.h.
CHEGR 681 Industrial Stoich.	4 q.h.	CHEGR 820 Industrial Pollution Control	4 q.h.
Mathematics Elective	4 q.h.	MATH 743 Math. Statistics I	4 q.h.
PHYS 610 Gen. Physics II	4 q.h.	CHEM 517 Gen. Chemistry I	4 q.h.
CE 877 Systems Engineering	4 q.h.	Basic Science Elective	4 q.h.

TRANSPORTATION/STRUCTURAL ENGINEERING OPTION(S)

Current Requirement		Proposed Requirement	
CHEGR 681 Industrial Stoich.	4 q.h.	CE Specialty Course*	4 q.h.
Mathematics Elective	4 q.h.	MATH 743 Math. Statistics I	4 q.h.
CE 711/CE 711L Surveying II	3/1 q.h.	CE Specialty Course*	4 q.h.

*For the structures concentration, CE 858 Timber & Wood Design will be the specialty course. For the transportation concentration, two new specialty courses (CE 830 Pavement Construction and CE 835 Highway Location Design) have been approved by the Department and are currently being reviewed by the School's Curriculum Committee. These will be eventually forwarded to the University Curriculum Committee for final approval.

YSU

Youngstown State University / Youngstown, Ohio 44555-3601
Department of Biological Sciences
(216) 742-3601

October 6, 1992

To: Dr. J. D. Bakos, Jr., Chair, Civil Engineering

From: Dr. Anthony E. Sobata, Chair, Biology

Re: Program Change

In response to your memo of 9-29-92, the Biology Department supports the inclusion of Biology 508 and Biology 780 as part of the basic science requirement for specialization in environmental engineering. I have spoken with Dr. Lauren Schroeder who teaches the Biology 780. He feels that the engineering students should be able to handle this course without the Biology prerequisite.

AES:cm

cc: Dr. Schroeder

INTEROFFICE CORRESPONDENCE

YSU

To: J. D. Bakos, Chair
Civil Engineering

From: Ikram Khawaja, Chair
Geology Department

Date: October 7, 1992

Subject: Civil Engineering Program Change

RECEIVED

OCT - 8 1992

CIVIL ENGINEERING DEPT.

The Department of Geology fully supports the proposed changes as outlined in your memo dated 9/28/92. The Curriculum Committee of the Department of Geology was also asked to comment on the proposed changes. This committee also fully supports the changes.

As you know that Department of Geology is also trying to develop a greater emphasis on environmental aspects of geology in its offerings and as such we would be fully supportive of other departments paying greater attention to environmental issues in their curriculum.

Dr. Jeff Dick is developing two new applied geology courses which may be of interest to you as well. I will ask Dr. Dick to supply you with more details.

Youngstown State University / Youngstown, Ohio 44555-3020
The William Rayen School of Engineering
Department of Chemical Engineering
(216) 742-3020

October 8, 1992

TO: Dr. J. D. Bakos, Jr., Chair
Civil Engineering

FROM: Soon-Sik Lim, Chair
Chemical Engineering S. Lim

SUBJECT: Civil Engineering Program Change

Faculty of the Chemical Engineering Department fully support your planned program change to add specialization in environmental engineering.

All the Chemical Engineering faculty believe that students majoring in any engineering discipline will benefit from taking Chemical Engineering 681 (Industrial Stoichiometry) because it will increase the student's basic knowledge of thermodynamics (material and energy balances). Since Chemical Engineering faculties also know that there have to be a limit in the number of different courses a student has to take in order to meet the requirement for a degree, we support your program change of the recommended replacement of Chemical Engineering 681 with Chemical Engineering 820 (Industrial Pollution Control).

Chemical Engineering faculties are eager to help and strengthen your environmental program further by adding a course on the subject of Hazardous Material Incineration/Management.

SSL/cds

INTEROFFICE CORRESPONDENCE

YSU

To: Dr. J. D. Bakos, Jr., Chair, Civil Engineering

From: Albert J. Klein, Chair, Mathematical and Computer Sciences AJK

Date: October 9, 1992

Subject: Civil Engineering Program Change

I am glad to support your proposed requirement of Math 743 for civil engineering majors and to report that this change would not have an adverse impact on the Department of Mathematical and Computer Sciences. In recent years we have offered 4 sections of Math 743 per year with a typical class size of 20-25 students. Within this scheduling pattern there is already capacity to absorb the projected increase in demand. At our current staffing level it would also be feasible to offer an additional section each year if enrollment would justify it.

YSU

Youngstown State University / Youngstown, Ohio 44555-3616
Department of Physics and Astronomy
(216) 742-3616
FAX (216) 742-1998

TO: J.D. Bakos Jr., Chair
Civil Engineering

FROM: Warren Young, Chair
Department of Physics & Astronomy

DATE: October 15, 1992

SUBJECT: Civil Engineering Program C[illegible]nge

The Department of Physics & Astronomy will certainly support your department in its effort to establish an Environmental Engineering program. It sounds like a valuable addition to the School of Engineering.

We cannot, however, support your intention to drop Physics 610 from the environmental aspect of your program. Civil E[illegible]eering already requires the least number of hours of physics of any program at [illegible]nd, according to a survey our department made recently, the least in the state of Ohio. Since physics is the basis of most of engineering, this appears to be a weakness in your program.

Instead of dropping Physics 610, we recommend you add Physics 611 and the physics laboratories to your required course list. This would bring the requirements of your program to the same level as that of the rest of the engineering programs at YSU and across the state of Ohio.

I am enclosing a copy of the department's survey of physics requirements in engineering programs in Ohio.

WY/sls
cc: Dean Mapley

YOUNGSTOWN STATE UNIVERSITY

Department of Chemistry

October 16, 1992

To: J.D. Bakos, Jr., Chairperson
Civil Engineering

From: Tom Dobbelstein, Chairperson
Department of Chemistry

Subject: Civil Engineering Program Change

This is to support your proposed program change to allow civil engineering students to specialize in environmental engineering. The addition of Chemistry 517 to their program and the option of Chemistry 719 and 720 can be accommodated with our typical present course offerings.

I suggest the inclusion of Chemistry 603 and 604 as electives appropriate to an environmental engineering specialization.

Dobbelstein

block may individually be included in categories such as Engineering Science or Design.

There is often some confusion in the interpretation of "how many credits represent the 'minimum' requirement." EAC/ABET has defined a typical four year program as 128 semester hours or 192 quarter hours. One-half year of credit would therefore represent 16 semester hours (24 quarter hours). If a program includes more than 128 semester hours (for example, 136 semester hours), the minimum expectation for one-half year of credit would remain 16 hours. If, however, a program included less than 128 semester hours (for example, 120 semester hours), then the minimum expectation for one-half year would be one-eighth of the total (15 hours).

Since these are minimum expectations, a program that falls below the specified number is generally considered as not in compliance with EAC/ABET criteria.

Individual courses may contain elements of more than one category. EAC/ABET allows the division of such course credits with allocation to appropriate categories. For example, a 3 credit course may contain two-thirds engineering science and one-third design; hence, two credits would be assigned to the engineering science category and one credit to the design category.

In the evaluation of curriculum content, special attention should be paid to the credit hour allocation assigned by different engineering programs to common courses presented using the same textbook and course syllabi. Where such differences are identified, an examination of consistency should be made.

c. Mathematics and Basic Sciences

The minimum combination of math and science credits must be equivalent to at least one year of study. Although one-half year is not required in each of the math and basic science areas, a curriculum which requires significantly less in either area should

be examined carefully to determine if students are receiving proper preparation in the area with the fewer number of hours. Only those math courses at a level beyond trigonometry may be included in this aggregate. EAC/ABET also requires completion of courses in integral calculus and differential equations.

Basic science requirements include general chemistry and general physics at an "appropriate" level. This is often interpreted as calculus-based physics and chemistry beyond the high school level. There is a minimum requirement of a two semester (or equivalent) sequence of study in either area. EAC/ABET expects some coursework in the basic sciences to include or be complemented by laboratory work.

The remaining credits needed to complete the one year math and basic science requirement may come from appropriate mathematics or basic science courses. EAC/ABET encourages the inclusion of such math courses as probability and statistics, linear algebra, numerical analysis and advanced calculus. Recommended basic science electives include life sciences, earth sciences, advanced chemistry and advanced physics. Other basic sciences are acceptable to meet specific program objectives. Note that computer science is NOT considered by EAC/ABET to be acceptable as a math or science elective. Computer science courses devoted to developing skills in computer programming must be considered in the "other" category.

d. Engineering Sciences

The one year of engineering science required by EAC/ABET may include courses such as mechanics, thermodynamics, electrical and electronic circuits, materials science, transport phenomena and computer science other than programming and use skills. At least one engineering science course must be selected outside the major discipline.

You should carefully evaluate courses specified by departments as engineering science to ensure that "...that is extension of knowledge toward creative application." It is sometimes found that courses described in a university catalog or in an EAC/ABET Questionnaire as engineering science are actually taught as a basic science.

YSU

Youngstown State University / Youngstown, Ohio 44555-3616
Department of Physics and Astronomy
(216) 742-3616
FAX (216) 742-1998

TO: Daryl Mincey, Chemistry
Chair, Academic Programs Committee

FROM: Warren Young, Chair
Department of Physics & Astronomy

DATE: February 5, 1993

SUBJECT: Dropping Physics from Environmental Engineering Program

The Department of Physics & Astronomy supports the Civil Engineering Department in its efforts to establish an Environmental Engineering program. It sounds like a valuable addition to the School of Engineering.

We cannot support, however, their intention to drop Physics 610 from the environmental aspect of the program.

A study of physics requirements statewide is shown in Appendix A. Notice that YSU engineering programs in general require less physics than that of other universities, and that our Civil Engineering program requires the least in the state.

Since physics is the basis of most of engineering, this is a weakness in the current program. Instead of *dropping* Physics 610, Civil Engineering should *add* Physics 611 and the physics laboratories. This would bring their program to the same level as that of the rest of the engineering programs at YSU and across the state of Ohio.

The importance of physics to engineering is clearly illustrated by looking at the Fundamentals of Engineering (FE) Test that is taken by engineering students during their senior year as a first step toward becoming licensed engineers. Presumably civil engineers with the environmental option will want to become licensed engineers. Appendix B shows several questions from the Practice FE test that Engineering has on reserve in the library. At the top of each sheet in the appendix is a sample FE problem, and at the bottom, a copy of the page from our current physics text that explains how to solve the problem. The examples shown here are all from Physics 610.

The committee might want to examine the success of YSU engineers on the FE test. Informed sources tell us that only 65% of YSU seniors pass the FE test, a rate that is next to the lowest of any institution in the state. Since many of the FE questions are from basic physics courses, perhaps our students would do better if they took as much physics as students at other universities.

If possible, I would like to meet with your committee to explain the position of the Physics Department more fully.

WY/sls

PHYSICS REQUIREMENTS, OHIO ENGINEERING PROGRAMS

Summary: There are 72 engineering bachelor degree programs offered by Ohio universities. One of these requires 8 q.h. of physics, one requires 9 q.h. (but recommends 12), two require 10, seven 12, one 13, three 13.5, two 14, thirty-one 15, eight 16, eleven 16.5, five 18, two 19, one 22 and one 23 q.h.

UNIVERSITY OF AKRON

Chem, Civil, Mech: 8 s.h. [12 q.h.];
EE: 11 s.h. [16.5 q.h.]

CASE WESTERN RESERVE

Aerospace, Biomed, Chem, Civil, Comput, EE, Indust, Materal, Mech, Systems: 11 s.h. [16.5 q.h.]
"Successful engineering rests on a deep knowledge of science..."

UNIVERSITY OF CINCINNATI

Aerospace, Comput, EE, Eng Mech: 18 q.h.
Chem, Civil: 10 q.h.
Indust, Materl, Mech, Metal: 15 q.h.
Nuclear: 23 q.h.

CLEVELAND STATE

Chem, Civil, Indust, Mech: 15 q.h.
EE: 19 q.h.

UNIVERSITY OF DAYTON

Chem, EE, Mech & Aerosp: 9 s.h. [13.5 q.h.]

MIAMI UNIVERSITY

Systems: 8 s.h. [12 q.h.]
Manufacturing: 6 s.h. [9 q.h.] required, 8 s.h. [12 q.h.] recommended

OHIO NORTHERN

Civil, Mech: 16 q.h.
EE: 19 q.h.
"...the scientific basis to engineering - math, physics, chemistry and the engineering sciences - are essential in all branches of engineering."

OHIO STATE

Aero & Astronaut, Agricul, Avia, Ceram, Chem, Civil, Comput & Infor Sci, EE, Indus & Systems, Materl Sci, Mech, Metal, Survey, Welding: 15 q.h.

OHIO UNIVERSITY

Chem, Civil, Indust & Systems, Mech: 15 q.h.
EE: 13 q.h.

UNIVERSITY OF TOLEDO

Chem, Civil, Comput Sci, Indust, Mech: 15 q.h.
EE: 18 q.h.

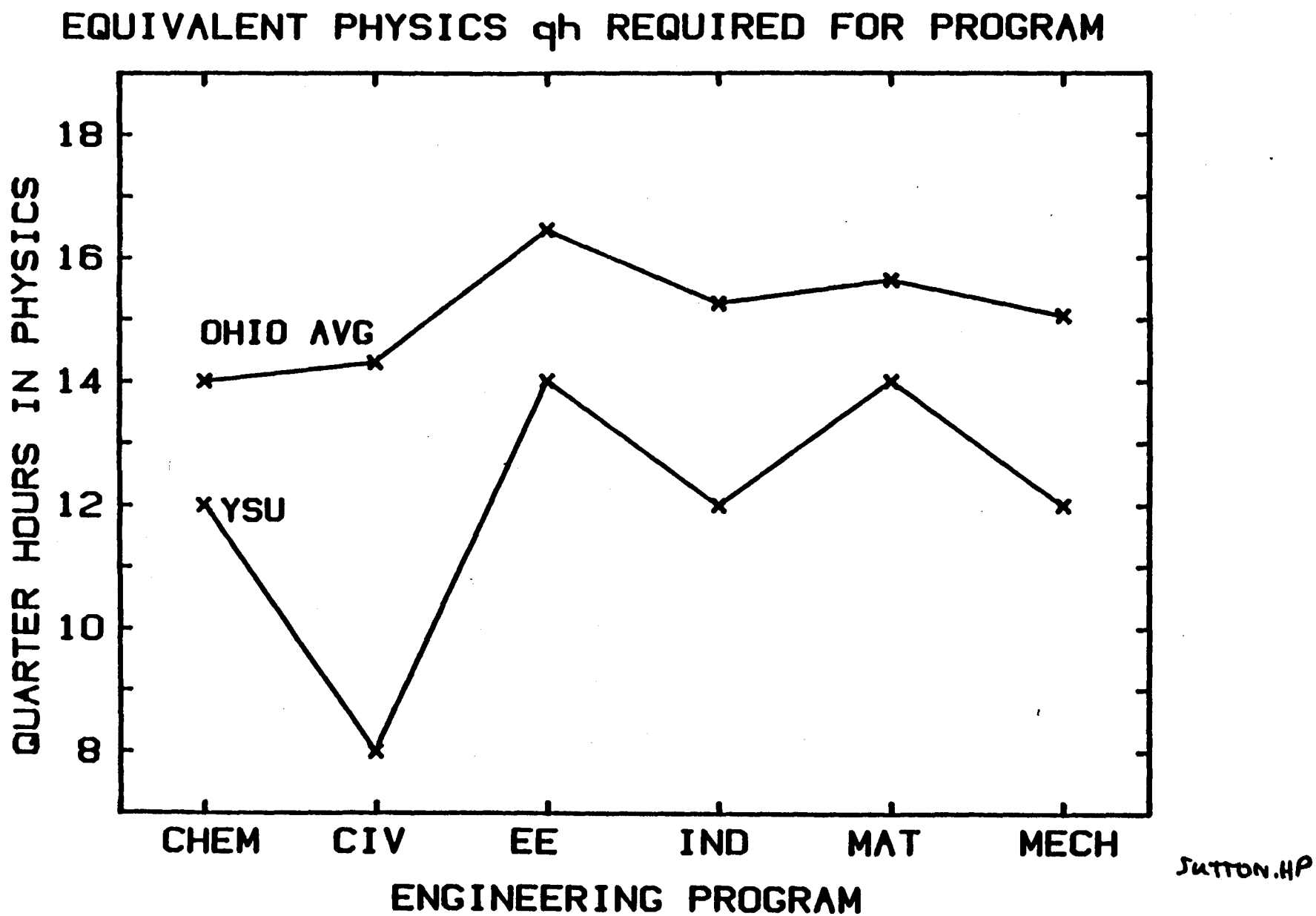
WRIGHT STATE

Biomed, Comput, EE, Human Factors, Materl Sci, Mech: 16 q.h.
Comput: 22 q.h.

YOUNGSTOWN STATE

Civil: 8 q.h.
Chem, Indust, Mech: 12 q.h.
EE, Materl: 14 q.h.

Note 1: List of schools offering engineering programs obtained from Engineering Education, December 1990
Note 2: Data obtained from either 1992-1993, 1991-1992, or 1990-1991 college catalogs


EQUIVALENT PHYSICS qh REQUIRED FOR PROGRAM
QUARTER HOURS IN PHYSICS
18
16
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OHIO AVG
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ENGINEERING PROGRAM
SUTTON.HP

Youngstown State University / Youngstown, Ohio 44555-3027
The William Rayen School of Engineering
Department of Civil Engineering
(216) 742-3027

February 8, 1993

TO: Daryl Mincey, Chemistry
Chair, Academic Programs

FROM: J.D. Bakos, Jr., Chair
Civil & Environmental Department

RE: FOLLOW-UP TO COMMITTEE MEETING

Enclosed you will find a sheet outlining the subjects covered on the Fundamentals of Engineering Examination (Engineer in Training Exam) which I read to the committee when I met with them on February 8, 1993. I am sorry that I did not leave a copy for you at that time, but I have enclosed a sufficient number for you to distribute to the other committee members.

I have read Warren Young's letter to your committee (dated February 5, 1993) and his additional supplemental material, and I have a few comments that I think are pertinent:

1. He has taken example (EIT) test problems from sections covering Strength of Materials, Mathematics, Statics, and Dynamics and compared them to similar example problems in a basic physics textbook. I do not believe that these examples are covered in Physics 610 (see course description) but rather in Physics 510, which all Civil Engineering students are required to take. However, the same text is used for both courses and, thus, his comparison is misleading.

2. The passage rate of YSU engineering seniors on the Fundamentals of Engineering Exam presented by Dr. Young on Page 2 of his memo is totally incorrect. As the official Ohio State Board of Registration Campus Representative to whom this data is transmitted on an annual basis, I can tell you that his values are, in fact, wrong.

3. Dr. Young's arguments seem to be redundant. All of the other YSU engineering programs take three full physics classes, and yet he claims YSU engineering seniors perform poorly on the Fundamentals of Engineering Exam. How many more physics classes do they need to take in order to improve their so called poor performance?