DEPARTMENT OF TECHNOLOGY SYSTEMS
PROGRAM REVIEW COMMITTEE REPORT

The Department of Technology Systems prepared a self study following program review guidelines. A two-person external review team visited the campus; reviewed the self study; interviewed unit personnel, university administrators, undergraduate and graduate students; and submitted an external report. The Program Review Committee studied all written materials (including a response to the report of the external review team submitted by the Department). The Committee liaison for the Department discussed the self study with the department chair and faculty. The Committee discussed its preliminary findings with the Interim Dean of the College of Technology. This document reflects the Committee’s findings and recommendations.

SUMMARY OF THE SELF STUDY

Introduction

Mission. “The mission of the Department of Technology Systems is to provide problem solving and leadership capabilities for those who seek, create and use knowledge and skills related to the technological disciplines in the department through the exercise of academic freedom” (p. 4). “The Department of Technology Systems carries out this mission by engaging faculty and students in both theory and practice” (p. 5). There is a blend of laboratory, classroom, and co-operative education experiences. “The Department is also committed to engaging the wider community through engagement-based learning through the undergraduate research initiative described in the BGSU Academic Plan” (p. 5).

History. The College of Technology was created in 1985 and the Department of Technology Systems in 1995. Over the last ten years the College more than doubled its enrollment to more than 1300 students.

Description of the Unit

Program identification. The Department of Technology Systems is one of two departments in the College of Technology.

Programmatic and curricular offerings. The Department offers four majors (Aviation Studies, Construction Management, Electronics and Computer Technology, and Manufacturing) within the Bachelor of Science in Technology degree. Each of these offers several areas of sub-specialization. The Manufacturing program has been suspended and at the time of the writing of the self study a proposal for a Design and Engineering Management major had been developed. Since that time, this proposal has been recast as a major in Design and Technology Systems (DTS). As part of the Master of Industrial Technology degree program the Department “teaches business and
leadership skills along with technical preparation in a specialized area” (p. 13). The Department also participates in a web-based consortial Ph.D. program along with five other universities. The degree is awarded by Indiana State University.

“Aviation Studies . . . is a Federal Aviation Administration (FAA) Part 141 approved flight education and training program. Aviation studies majors choose from one of three specializations: aviation management and operations, aviation technical management, or flight technology and operations. Coursework in each specialization is complemented by business and liberal arts classes that differentiate BGSU’s program from many others of its kind” (p. 5).

“Construction Management and Technology program prepares students to work for Construction Contractors, Engineering/Architectural Firms, Public Agencies and Trade Associations. The program includes coursework in General Education, Natural Sciences, Mathematics, Business, Technology Design, and Construction” (p. 6).

“Electronics and Computer Technology is a comprehensive study of diverse areas such as Computer Hardware and Interfacing, Computer-Based Instrumentation and Process Control, Digital Communication and Networking, and Electric Motors and Controls. Students have hands-on opportunities to learn the working of real world data communication and control systems. Students participate in activities related to the Electric Vehicle Institute - which is involved in designing and testing of electric motors, electronic controllers and instrumentation systems” (p. 6).

“Design and Engineering Management [now Design and Technology Systems] is the [proposed] merger of the Mechanical Design program in the department of Visual Communication and Technical Education and the Manufacturing program in the department of Technology Systems” (p. 6). The curriculum for this new major has been approved by Undergraduate Council.

Faculty resources. Faculty resources are divided among the four undergraduate program areas as follows:

- Aviation Studies (4): Associate Professor (3) and Instructor (1).
- Construction Management (4): Associate Professor (2), Assistant Professor (1) and Instructor (1).
- Electronics and Computer Technology (3): Professor (1), Associate Professor (1), and Instructor (1).
- Design and Engineering Management [now DTS] (6): Professor (1), Associate Professor (2), Assistant Professor (1), and Instructor (2).

Graduate assistant resources. The unit has five master’s level and two doctoral level graduate assistants.
Staff resources. There is one full-time secretary; work-study students are also employed. Staff from the Co-op, Tech Stores, and Advising areas in the College provide support to department activities.

Student credit hour production. Student head count is presented in lieu of credit hour production. From 2001 to 2005 Aviation Studies head count increased from 130 to 131 (0.8%), Electronics and Computer Technology increased from 66 to 111 (68.2%), Construction Management increased from 175 to 228 (30.3%), and the suspended Manufacturing program decreased from 31 to 15 (-48.4%) (p. 21).

Recruitment and retention efforts. Each program area has developed promotional literature (distributed at Preview Day), other on-campus recruitment programs, and professional meetings. In addition, web pages are maintained. These efforts support the college-centered recruitment activities at both the undergraduate and graduate levels.

The College of Technology retention rate for freshman (fall to fall) from fall 2002-03 to fall 2004-05 increased from 67% to 85.6%. Department and program area data are not available.

Facilities and equipment. There are large laboratory spaces in the technology building used by different programs. In addition, there is a set of up-to-date ITS-supported computer laboratories in the College. Classrooms and other instructional areas have been enhanced and video projection and other audiovisual equipment is readily available.

Information resources and services. A wide range of computer software is available to meet instructional needs and faculty computers are upgraded on a regular basis.

Financial resources. The department operating budget has remained constant at $33,000 throughout the review period. Each program area receives $3,000 for discretionary expenditures and each tenured faculty member $750 for professional travel. The rest goes to student help, copying, telephone, etc. The Vice Provost for Research provides new tenure-track hires $10,000-$13,000 in start-up funds, and College grants are available to support travel for presenting research, training sessions, and instructional purposes. Lab fees help maintain supplies for laboratories and the Technology Store.

Self Evaluation

Faculty quality and productivity. The self study presents a SWOT (strengths-weaknesses-opportunities-threats) analysis for three of the four programs. Nothing is said about the proposed Design and Engineering Management (now Design and Technology Systems) program. All three analyses cite “faculty” as a strength but provide no data or analysis in support of this assertion. (The section on Construction Management and Technology cites the ACCE report). The same is true for the many other items listed for each program in the SWOT analysis. Among those cited for Aviation Studies are
continuing upgrades of aircraft, paying off of operating debt, and excellent safety record (strengths); limited resources and co-op opportunities (weaknesses); and competition for students, cost of fuel, and the lab-fee-based funding model (threats). Among the other items cited for Construction Management and Technology are co-operative education and ties with the construction industry (strengths); lack of staff, space and co-ordination of the curriculum (weaknesses); and possible cuts in funding (threats). For Construction Management and Technology a number of goals are listed in lieu of strengths; understaffing and poor financial resources are identified as weaknesses; and the Engineering Technology and Engineering programs at the University of Toledo are cited as threats.

**Student entry attributes.** College of Technology data are provided in lieu of program-specific data on entry attributes of undergraduates. For the College of Technology (period of data collection not specified) 13% of entering freshman have an ACT score higher than 25 (scholarship range) and 26% have scores of less than 20 (academic deficiency). Average GPA for the College of Technology for fall 2002 was 2.73 and for fall 2003 2.72. “These scores are slightly higher than those of students in the College of Business Administration and of students in the Academic Enhancement Program (undeclared majors); the scores are slightly below the average for the entire university” (p. 25).

With regard to graduate students in the Master of Industrial Technology program, average GRE scores are as follows: Verbal 390; Quantitative 570; Analytical 460; Analytical Writing 3.62/6.0 (period of data collection not specified).

**Assessment of student learning outcomes.** “Each undergraduate and graduate program in the College of Technology has learning outcomes that have been established by the faculty of the programs. Each program utilizes the outcomes to guide assessment and program development each year. A timeline has been established to ensure regular review” (p. 25). “A review of the assessment reports indicated that most programs are gathering and utilizing indicators for assessment and improvement. As an example, we have conducted a status study of graduates from 2000-2005 and the results will be distributed to the programs in September for their review. A College-wide implementation of e-portfolio use by all majors will be put into place fall 05 that will provide various indicators that will be identified by the program areas” (p. 26). “At this time, there is little feedback from faculty or students that indicates that students understand how the course and program assessment results are used to improve the program. The addition of the e-portfolio requirement college-wide will highlight how the e-portfolio, the student’s self-assessment, and the advisor’s use of their portfolio will be used to improve the overall experience and program. One of the main intents is for students to take ownership of their learning experience and to develop a reflection of their progress each year” (p. 26).

**Curriculum, instruction, and support services.** The only information in the self study relevant to this is the following: “The Construction Management program was cited by the ACCE accreditation team regarding a high 48:1 student to full time faculty ratio.
While the former Dean disputed the number it is a major concern. The growing dependence on part time faculty is a concern to the College and the University as a whole. The ratio in Electronics and Computer Technology is 33:1” (p. 22).

Service. No information, analysis, or evaluation provided.

Comparative advantage and program distinctiveness. No information, analysis, or evaluation provided.

Demand. In lieu of program-specific data, College data relevant to student demand and that for graduates are provided.

“The demand for programs within the College and Department has been steadily increasing with the exception of the Manufacturing Program, which is under suspension” (p. 39).

“A follow-up study of the 1996-2000 graduates of the College of Technology found that 95.4%) of the graduates who responded [response rate not specified] are employed in technological professions directly related to their major after five years post graduation. Almost all of the graduates secured their first professional position in less than three months after graduation” (p. 39).

Connection to the mission. “The programs in the Technology Systems Department are in strong alignment with the engagement mission of Academic Plan of the university” (p. 39). “Through the Cooperative Education program and through program advisory boards the TechSystems Department is heavily involved in the scholarship of engagement. Each of our students spend[s] three full semesters working in the public or private sector both domestically and abroad” (p. 40).

Financial considerations and adequacy of resources. The operating budget has remained constant at $33,000 for the last ten years despite an increase in programs and faculty. “At the same time technical support in our laboratories was eliminated resulting in the faculty bearing the responsibility to fix and maintain laboratory equipment. This increases the load on our faculty with no recognition in our merit system” (p. 40).

Doctoral programs. “The Ph.D. in Technology Management program is delivered in co-operation with five other nationally-accredited universities. Indiana State University is the degree granting institution. Central Missouri State University, East Carolina University, and North Carolina A&T are the other three members of the consortium. The Ph.D. in Technology Management is a web-based program designed to meet the needs of today's technical professionals by offering academically rigorous coursework and experience through distance education” (p. 42). The program offers specializations in five areas: Construction Management, Digital Communication, Human Resource Development and Training, Manufacturing Systems, and Quality Systems.
No information, analysis, or evaluation is provided for the following aspects of the program listed in the self-study guidelines: faculty, graduates, vitality, demand, interactions, access, student outcomes assessment, and program revisions from previous reviews.

**Unit planning (next seven years)**

In lieu of a plan for the Department, the self study presents separate plans for the three operational program areas: Aviation Studies, Electronics and Computer Technology, and Construction Management and Technology. Each area views itself as understaffed and underfunded.

*The planning process.* No description provided for any of the program areas.

*Goals and strategies.* Aviation Studies identifies space, the continued replacement of aircraft for an aging fleet, improving the diversity and quality of students, limited resources because of the almost exclusive reliance on lab fees to fund the program (the only support the program receives from the regular university budget is the faculty position), and the unpaid nature of most of the student internships as the major areas that need to be addressed. The program is working with its advisory board to plan a new aviation facility (perhaps funded through a public sector bond issue) and is addressing the aircraft replacement issue through a combination of leased and university-owned aircraft.

Electronics and Computer Technology identifies the undergraduate curriculum, graduate curriculum, program outreach, and staffing as the major areas that need to be addressed. The area has identified steps to enhance the curriculum at both the graduate and undergraduate levels, improve industrial relations, continue scholarly activities, and generate internal and external grant funding as goals.

Construction Management and Technology identifies enhancing the quality of program graduates, increasing enrollments (if additional faculty resources are made available), reviewing the undergraduate curriculum, revamping the Master of Industrial Technology program, re-conceptualizing the co-op program, and strengthening relationships with the construction community and alumni as goals.

*Timetable and implementation plan.* No timetable/implementation plan provided.

*Relationship to the Academic Plan.* Construction Management and Technology is actively promoting the theme of New Media and Emerging Technologies through leadership of the chair in this important area, and Leadership in Learning through innovative teaching. No information or analysis is provided by Aviation Studies or Electronics and Computer Technology.

*Questions for the external team.* No questions provided for any of the areas.
RESULTS OF PREVIOUS REVIEWS

The previous program review was at the college rather than department level. Listed below are the Program Review Committee recommendations that appear to be relevant to the Department and the responses reported by the Department in these areas.

*Increase extramural funding.* Agreements have been forged with Firelands and community colleges to establish a Lean Manufacturing outreach program. No data are provided on the amount of extramural funding generated.

*The College should focus on its programmatic offerings.* Collaboration between Manufacturing and Mechanical Design has developed.

*Develop a strategy to involve faculty with colleagues in other colleges and the University.* There is improved collaboration between the departments in the college. The Chair of Technology Systems is the Director of the New Media and Emerging Technologies initiative.

*Technology Systems should meet with counterparts in the University.* Faculty have sabbatical leaves within the Center for Applied Technology; faculty serve as New Media and Emerging Technology scholars; a program is under development in food sciences; and there is co-operation on computing with ITS.

*Explore the development of 2+2 programs with Ohio and other states.* An on-line degree is under development.

*Discontinue the hiring of BG alumni.* “We continue to hire the very best faculty” (p. 7).

*Improve assessment.* Exit interviews are conducted; “increased retention rates are among the highest in the University” (p. 7); improvements have been made in advising through the use of mid-term evaluations.

SUMMARY OF THE EXTERNAL REPORT

The external reviewers praise the morale of the faculty, staff, and students. They describe the curricula and instruction of the three active undergraduate programs as appearing “to be modern and within the state of the art and comparable to similar programs at other institutions” (p. 2). They view the “close contact between faculty and students in developing students’ academic programs” (p. 2) as a real strength. They indicate that “students seem to be satisfied with their career opportunities,” although the self study lacked data in this regard (p. 3). They support the merger of architecture and environmental design with construction management technology.

At the same time they raise a number of significant concerns.
• The self study was not particularly well-done. It “was somewhat disorganized and inconsistent.” In addition, it “was long on wishes and short on data” (p. 1).

• “The faculty are competitive nationally with the exception of scholarly activity. However, given staffing levels, enrollments, and the lack of incentives, the scholarly productivity of the faculty is at a level the reviewers find acceptable” (p. 1).

• “The plans of the unit for the next seven years are quite murky. They appear to be driven by presumed, rather than rigorously researched, market forces. In addition, the unit suffers from a lack of focus. Faculty are, as is common when leadership is lacking, jockeying for faculty lines and other resources among themselves, rather than asking “where can I be productive given that demand for my area is declining?”” (pp. 1-2).

• “The programs within the department appear to have effective plans for using assessment outcomes in both modes [as teaching tools and as a source of information about how to improve the curriculum and learning environment]; however, there is little evidence that these plans have been implemented and monitored such that feedback is utilized either in advising students or informing curriculum changes” (p. 2).

• “There are certainly a surprising number of programs within the department. Counting the graduate programs, there are five or six programs (some with multiple tracks) that are being serviced by 18 faculty (at least five of whom are non-tenure track faculty). Since this leads to a student faculty ratio of roughly 30, it is highly likely that the quality of some programs has been, or will be, compromised. Curricula, almost without exception, are designed in such a way that strains faculty resources. Given that only 40% of faculty time is deemed to be appropriately devoted to instruction, faculty workloads and curricular requirements must be simultaneously re-examined and streamlined in order to enable faculty to realistically meet the scholarly and service requirements as set out in faculty workload policies of the university and the college” (pp. 2-3).

• “There is little evidence of significant faculty productivity in research and scholarly activities. However, the quality and dedication of the faculty is high and they are quite capable of reasonably high productivity given appropriate incentives such as release time, revenue return to the unit, and reasonable teaching loads. The reviewers believe that the mandatory cooperative education program has not been used to its full potential in contacting and cultivating prospective sponsors of research and other creative activity” (p. 3).

• “Given that central services provided by the college are minimal, the department, with only one secretary (excepting aviation studies) does a commendable job in carrying out administrative tasks. However, faculty are forced to act as their own technicians and maintenance personnel. Moreover, these duties are unrecognized as part of faculty workload or merit” (p. 3).

• “The existing cooperative education (co-op) program must be re-examined as it places unrealistic constraints on curricula, student graduation rates, and program growth. Worse, the unusual practice of compensating faculty for summer co-op employer visits serves as a huge disincentive to faculty research. While financially lucrative for the faculty, it is a trap that prevents them from engaging
in other revenue-enhancing activities, including extramurally funded research” (p. 4).

• “The weaknesses in the Construction Management and Technology program identified in the ACCE report must be satisfactorily addressed as soon as possible since re-accreditation is in dire jeopardy” (p. 4).

• “Evidently, a number of faculty lines and laboratory space remain devoted to a program (Manufacturing Technology) that has been discontinued. These faculty members, rather than contributing to offsetting the large instructional loads of existing programs, insist on re-making their program under a different name or generating other programs whose success is questionable” (p 4).

**PROGRAM REVIEW COMMITTEE FINDINGS AND RECOMMENDATIONS**

The Department of Technology Systems has a hardworking faculty with high morale despite a very high student-faculty ratio and a disproportionate number of faculty in instructor lines. The external consultants view the courses offered and methods of instruction as up-to-date. The placement record, although undocumented, appears to be quite good. In all of these areas the Program Review Committee says “Job well done!” and keep up the good work.

At the same time the Committee is concerned about the apparent lack of progress in addressing the findings and recommendations raised during the last review seven years ago. Admittedly, that was a college rather than department-based review; and this might account for the degree of attention the Department has given to these things. The Committee believes that the findings and recommendations presented below, if effectively addressed, will benefit the Department, its faculty and students, and the region. The Committee urges the Department to address them vigorously and effectively now so that it will in a position to report significant progress in these areas at the time of its next program review.

1. The Self-study Document

Finding. The committee shares the concerns of the external consultants about the quality of the self-study document. At many places it deviates from the self-study outline making it hard to follow. Little documentation and supporting data are provided making it hard to assess the claims made. There is little in the way of the self-evaluation requested making it hard for the program review process to accomplish its primary goal—i.e., an evaluation of the quality of the department, its programs, faculty and students. Because of these problems the self-study will not provide the new dean being hired with the kind of careful, deep, and reflective picture of the program and its quality that is needed for effective leadership and decision-making.

Recommendation. The Department should re-write the self-study document following the self-study outline; providing documentation for and data in support of the claims made; providing a genuine self-evaluation in the second part of the document.
based on the documentation and data provided in the first part; and addressing the findings A, B, C, and D below. In addition, current data, some of which are attached, should be used so that the report will be of maximum value for decision-making at the collegiate and university levels. If there are any questions as to what is expected here, the Program Review Committee would be glad to provide an example of a well-done self study for the Department to review. In addition, if requested, a member of the Program Review Committee would be willing to meet with the Department at the outset of the re-writing process. Although self studies are typically drafted by one or two individuals, they are significantly enhanced by overall faculty involvement in the process. This typically takes the form of individual input during the initial drafting and group review and discussion of the draft before it is finalized. This rewritten report should be submitted to the Dean of the College of Technology in draft form by October 1, 2006. Upon receiving and reviewing the draft the Dean may request any clarifications or additional information and evaluation deemed necessary to provide a careful, deep, and reflective picture of the unit and its quality. The Dean should provide this feedback in time for the rewritten self study to be finalized by the Department and officially submitted to the Dean, with a copy to the Provost, by Thanksgiving break.

A. Department Planning

Finding. The self study reflects little in the way of departmental planning. Goals are provided for each of the three active majors in the Department. However, for the most part they take the form of “wish lists.” There is little in the way of prioritization among the things on each area’s list. Moreover, there is no attempt to coordinate the plans for the majors within an overall plan (with priorities) for the Department within the resources available to it.

Recommendation. A Department plan, with priorities clearly identified should be developed and included in the rewritten self study.

B. Enrollment Management

Finding. One data item included in the self study is entering ACT scores for freshman in the College of Technology (year not indicated). That 13% have a score greater than 25 is certainly laudable. That 26% have scores below 20 is of great concern. Since department data and major data, which are available from the Office of Institutional Research on these and other measures of student quality were not provided in the self study, the Committee cannot judge the extent of this problem for the Department and its majors. To the extent that this is a problem for the majors within the Department there are a variety of things that could be done to manage enrollment effectively. One would be to hold enrollments constant while recruiting more students with ACTs above 20 and thus fewer with ACTs below it. This would both improve student quality and reduce the additional time faculty have to invest when working with lower quality students. Another approach would be to admit fewer students by setting higher admission standards. Of course there are other possibilities as well.
Recommendation. The rewritten self study submitted should include a major-specific enrollment management plan for the Department designed, in conjunction with other planned steps, to improve student quality and ensure appropriate faculty workloads within the available resources. This plan should be based upon, among other things, appropriate enrollment targets for the Department established by the Dean in consultation with the Provost.

C. Faculty Productivity

Finding. The faculty teach a large number of students and appear to do it well. However, there is little evidence of faculty scholarship or grant-writing success. Teaching loads and scholarship/grant writing at universities tend to be inversely proportional. In addition, as the external consultants observed, the high level of compensation for supervising co-op students in the summer functions as a disincentive for seeking summer grant funding from external sources which, if obtained, would help improve scholarly productivity. The external consultants also indicate that curricular modifications including, but not limited to, changes in the co-op program, could play a role in making teaching loads more manageable. The Committee accepts the external consultants’ view that the faculty is capable of significant scholarly accomplishments if provided with the time and incentives to do so. However, providing the time and incentives within the existing resources will require creative thinking about the curriculum, enrollment management and finding D below.

Recommendation. The rewritten self study should include a plan to increase faculty scholarship and grant activity within the existing resources.

D. Staffing

Finding. Staffing is of concern to the Department, accreditation agencies, the external consultants, and the Program Review Committee. Heavy teaching loads do not appear to leave sufficient time for scholarship and grant writing, there is an excessive reliance on temporary faculty, and some faculty have even been called upon to maintain equipment. At the same time, the faculty of the Department and College support replacing the suspended Manufacturing major with one in Design and Technology Systems. This proposed major undoubtedly has significant academic merit. However, the Committee has neither the ability nor responsibility to make such judgments. Rather, the Committee is concerned with the interplay between program quality and resources. There are significant concerns identified by the faculty, the external consultants, and the Program Review Committee. The state budget picture is bleak at best. A new major should be implemented at this time only if there are sufficient resources to address the concerns that the program review process has brought to light and maintain a new program of high quality.

Recommendation. The rewritten self study submitted should include discussion of the proposed program in Design and Technology Systems within the concerns identified above. In other words, how will the Department be able to support a high-quality Design
and Technology Systems major, and address its concerns and findings (B) and (C) above, within the resources available to it?

2. Assessment

Finding. According to the external consultants, “The programs within the department appear to have effective plans for using assessment outcomes in both modes [as teaching tools and as a source of information about how to improve the curriculum and learning environment]; however, there is little evidence that these plans have been implemented and monitored such that feedback is utilized either in advising students or informing curriculum changes” (p. 2). The Committee fully concurs with this judgment.

Recommendation. The Department should begin using the feedback received from each major’s assessment plan to implement and monitor appropriate curricular, pedagogical, and advising changes. Progress in this area should be reported annually to the Student Achievement Assessment Committee.

3. Program Review Process for the College of Technology

Finding. In the first round of program review the College of Technology was reviewed as a college and in this round the review was department-based. This provided a greater depth of review for the two departments within the College. However, there are a number of college-based activities/entities (e.g., the Co-op program, Tech Stores, Electric Vehicle Institute, Center for Applied Technology, etc.), which warrant review both in their own right, and because of the significant impact they have on the academic programs within the College, that are not covered in the department-based reviews. Although the department-based reviews should continue in the College of Technology, reviews of these other activities/entities should be added to the review process.

Recommendation. The Dean of the College, in conjunction with the Vice Provost for Academic Programs, who oversees the program review process, should develop a plan for reviewing these other activities/entities in the College on a regular (i.e., eight-year) basis. This review should be separate from, but coordinated with, the department review process and there should be significant department and faculty input into the review of the college-based activities/entities. There should be three self-studies, one for each of the departments plus one for the College-based activities/entities. Separate external review teams for each self-study should be involved. Because of the interconnectedness between the college-based activities/entities and the departments, and between the departments themselves, it is recommended that all units in the College undergo review during the same year. The plan for implementing these changes to the Program Review Process should be submitted to the Provost for approval by the start of spring semester 2007.

The Department of Technology Systems should report annually to the Dean of the College of Technology, with a copy to the Provost, on the implementation of these recommendations.