Program Review

Master of Science in Engineering

College of Information Technology

October 2006
For Academic Years 2001-2006

MARSHALL UNIVERSITY
College/School Dean’s Recommendation

Deans, please indicate your recommendation and submit the rationale.

Recommendation: For Master of Science in Engineering

CONTINUATION OF THE PROGRAM AT CURRENT LEVEL OF ACTIVITY

Rationale:
(If you recommend a program for further development identify all areas for specific development; if you recommend a program as a program of excellence address all criteria listed in HEPC Series 11)

M.S.E. degree program is a multi-disciplinary engineering program designed to meet the specific needs of engineers employed in industry, government and consulting firms in the region. The program offers a central core curriculum with opportunities for concentrated study in selected areas of emphasis. Areas of emphasis currently available include Engineering Management and Environmental Engineering. The M.S.E. degree program has been developed in accordance with standards adopted by the Accreditation Board for Engineering and Technology.

The M.S.E. program faculty utilizes the services of five full-time faculty members in CITE’s Engineering and Computer Science Division, as well as the services of two full-time faculty members in CITE’s Division of Applied Science and Technology. Of these faculty members, three are registered professional engineers.

Course content and scheduling are designed to serve the needs of a student population of which the majority is are fully employed (part-time) professionals. However, the number of full-time students is growing steadily. Prior to graduation, these students usually have identified a new job, promotion, or wage raise. Several students have gone on to doctoral degree programs in engineering, or other professional areas such as law or medicine. The salaries of our graduates are competitive with the other engineering graduates in their fields.

Enrollment has been steady over the past five years and is expected to the steady over the next five years and beyond.

Signature of the Dean:

_______________________________________ Date:________________________
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Program Review
Master of Science in Engineering

Marshall University
College of Information Technology and Engineering
Engineering and Computer Science Division

Date of Current Review: October 2006
Date of Previous Review: October 2001

I. Program Description

The Master of Science in Engineering (M.S.E.) degree program, offered by Marshall University’s College of Information Technology and Engineering (CITE), is a multi-disciplinary engineering program designed to meet the specific needs of engineers employed in industry, government and consulting firms in the region. The program is housed within CITE’s Engineering and Computer Science Division, and offers a central core curriculum with opportunities for concentrated study in selected areas of emphasis. Areas of emphasis currently available include Engineering Management and Environmental Engineering.

M.S.E. degree students are required to complete a minimum of 36 graduate credit hours, including 15 hours of core courses and 21 hours specific to the selected area of emphasis. The comprehensive project, which comprises three hours of the core, typically is an applied project that requires a fusion of the knowledge obtained in the course work and its application to a realistic problem from the relevant subject area.

The M.S.E. degree program is based in the Charleston-Huntington area, but is offered at other sites as the need arises. Course content and scheduling are designed to serve the needs of a student population that consists primarily of fully employed professionals, and has a slowly growing number of full-time students.

The stated mission of the M.S.E. degree program, developed in accordance with standards adopted by the Accreditation Board for Engineering and Technology, is to provide multi-disciplinary, graduate level engineering education appropriate for working professionals and others who do not have the option of full-time programs in a traditional university setting. CITE will continue to provide academic instruction and service to provide life-long learning and career enhancement opportunities to its students in the business, industrial and government communities and to enhance the economic development of the region.
II. Accreditation Information
Not applicable.

III. PROGRAM STATEMENT on Adequacy, Viability, Necessity, and Consistency with University/College Mission

A. Adequacy

1. Curriculum

The M.S.E. curriculum is designed to provide students with a strong core of courses (15 hours) in subjects of importance to every engineering discipline, supplemented by more focused courses applicable to each student’s specific area of emphasis (21 hours). Through completion of 36 required hours of graduate study, M.S.E. students gain exposure to a broad range of topics relevant to all engineering design and practice, such as project management and statistical analysis. Students also have the opportunity for in-depth study of topics relevant to particular engineering disciplines. (See Appendix I.)

Core Courses

The core curriculum for the M.S.E. degree consists of five courses: Project Management, Applied Statistics, Computer Applications, Comprehensive Project Formulation, and Comprehensive Project.

Project Management provides students with a practical knowledge of how to integrate effectively the efforts of various employees and associates in the execution of typical engineering projects and programs. Applied Statistics addresses the acquisition, analysis and interpretation of data, applied in various contexts including design of experiments, forecasting, and modeling.

Computer Applications builds on the skills possessed by most practicing engineers. The course is designed to teach students the effective use of commonly used software programs, such as Excel and Matlab, to solve various types of engineering problems, including numerical analysis, modeling, and design.

In response to engineering employer demand for more intensive education in technical writing and communications, as well as to better prepare students for work on the comprehensive project, M.S.E. students are required to complete Comprehensive Project Formulation. This course provides opportunities for students to expand technical writing skills in the context of the engineer’s working environment, and also provides direction on selection of comprehensive project
topics and successful completion of the project proposal. The companion capstone Comprehensive Project course requires each student to produce an original solution to a realistic engineering problem under the supervision of a project committee and faculty advisor. The student must prepare and defend a detailed, effectively written project report, which must be approved by the project committee prior to successful completion of the course.

Areas of Emphases Courses

**Engineering Management:** This area of emphasis is designed for engineers who hold or wish to move into a management position, and requires nine hours of management courses: Management of Technical Human Resources and Organizations, a study of human relations, personal development, employee development, and personnel functions; Operations Management, an examination of the quantitative and conceptual tools for generating goods and services; and Engineering Economics, a study of the principles of engineering economics and various other financial management issues. Students may take equivalent courses from the Technology Management degree program in order to satisfy these requirements, with advisor approval. These topics provide the foundation for engineering management education. In addition, with advisor approval in a Plan of Study, students complete at least twelve additional hours of electives, which can include technical/design engineering courses or more advanced management courses, depending on the particular student’s interests and goals.

**Environmental Engineering:** The emphasis in environmental engineering is designed for those engineers who work or wish to work in such areas as water/wastewater treatment, groundwater and soil remediation, solid and hazardous waste management, air pollution control, and industrial hygiene. Students must complete fifteen required hours, including Environmental Risk Assessment, Environmental Engineering Design, Environmental Chemistry, Environmental Law, and one course in either Air Pollution Design, Air Pollutant Dispersion and Modeling, Environmental Geotechnology, or Groundwater Principles and Monitoring. Students also complete six hours of approved elective courses in a Plan of Study, which relate to their particular environmental interests.

**Chemical Engineering:** Due to diminishing enrollment in the chemical engineering area of emphasis and the retirement of the professor coordinating that area, we have stopped admitting students to this area of emphasis and have been phasing it out rapidly. There is only one active student left in the chemical engineering area of emphasis and she should be graduating within the coming year, at which time this area of emphasis will have been completely suspended.
2. Faculty

The M.S.E. program faculty utilizes in part of the services of five full-time faculty members in CITE’s Engineering and Computer Science Division, as well as part of the services of two full-time faculty members in CITE’s Division of Applied Science and Technology. Of these faculty members, four are tenured and two are tenure-track. Three are registered professional engineers. All but one hold terminal degrees in their fields of expertise. All full-time faculty were professionally employed in fields relevant to their teaching emphases prior to joining CITE, and continue to be actively involved in their professions through consulting, funded research, professional societies, and other service activities. One of the above faculty members is involved full-time in the M.S.E., while the other faculty also teach courses in CITE’s other degree programs. This full-time faculty member regularly publishes and presents papers at national conferences and is currently working on a book to be published in his area of expertise.

Several carefully selected and highly qualified adjunct faculty teach courses in the M.S.E. degree program, especially in courses where current, ongoing engineering practice plays an important role in course content. The faculty data sheets for the M.S.E. faculty are included in Appendix II.

3. Students

(a) Entrance Standards

Students admitted to the M.S.E. degree program should hold an undergraduate engineering degree from an ABET-accredited institution. Students with undergraduate degrees in related fields are admitted on a case-by-case basis, depending on the specific undergraduate program of study and courses completed, as well as relevant work experience. In addition, students may be required to complete foundation coursework in required undergraduate engineering topics.

For full admission to the M.S.E. program, students must also satisfy two of the following three requirements: undergraduate cumulative GPA of 2.75, score at the mean or above on Graduate Record Examination, successful completion of Fundamentals of Engineering and/or Principles and Practice examinations as administered by NCEES.

In addition to these entrance requirements, foreign nationals must also score at the mean or above on the TOEFL.
(b) **Entrance Abilities**

Students admitted to the M.S.E. program possessed the following average scores over the period of assessment for this program review:

<table>
<thead>
<tr>
<th>Metric</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Undergraduate GPA</td>
<td>3.12</td>
</tr>
<tr>
<td>Average GRE quantitative score</td>
<td>637</td>
</tr>
<tr>
<td>Average GRE verbal score</td>
<td>448</td>
</tr>
<tr>
<td>Average GRE analytical score</td>
<td>Not available</td>
</tr>
</tbody>
</table>

(c) **Exit Abilities**

All M.S.E. students are required to complete a final project, which typically is work-related. A committee of faculty this work to ensure that the student has successfully mastered key engineering concepts covered in coursework, as well as the ability to apply these principles in a practical engineering context.

Since many of the M.S.E. students have obtained or are well on the way toward obtaining professional registration prior to entering the program, licensing examinations do not necessarily provide evidence of exit abilities. However, informal feedback from students and focus group attendees indicates that many students have found the program course content helpful in their pursuit of professional registration and continuing education requirements.

4. **Resources**

(a) **Financial**

Marshall University supports the M.S.E. degree program through full support for one professor of engineering and a portion of support of four other full-time Engineering and Computer Science Division faculty positions, plus a portion of full-time faculty salaries from the Applied Science and Technology Division, a portion of several administrative secretarial positions, office space, current expense and travel budgets.

The Weisberg Division of Engineering and Computer Science offers two graduate and two undergraduate degrees: MS in Engineering, MS in Information Systems, BS in Computer Science, and BS in Engineering. The total budget for the division is $932,559. Of this total amount, $868,312 is for salaries (93%) and $64,247 is for current expense. The program is also supported in part through contributions from several special revenue accounts generated from previous
contract and continuing education courses offered by the former West Virginia Graduate College.

If this program were terminated as a major, approximately two to three faculty salaries would be the resulting savings. However, due to the fact that all engineering faculty teach required courses in other CITE degree programs, additional faculty would need to be hired as replacements. In addition, enrollment in other CITE courses would be negatively impacted due to the sharing of some courses among majors. Termination of the M.S.E. program would eliminate approximately four to six M.S.E. courses per year taught by adjunct faculty.

(b) Facilities

CITE provides its students a variety of modern, technologically advanced facilities designed to support and enhance their studies. New and well-equipped classroom facilities designed especially for adult learners are available in the Robert C. Byrd Academic and Technical Center on the South Charleston campus. All M.S.E. courses are regularly offered from this location. In addition, classes are offered on the Huntington campus, and at other locations according to demand. Better facilities in Huntington have been very badly needed for some time, and the Applied Engineering Complex is in the planning stage to meet this need. Occasionally classroom space at Hurricane High School is utilized.

The M.S.E. degree program frequently and regularly makes use of multiple distance learning classrooms, which link the Huntington and South Charleston campuses with innovative and up-to-date class delivery capabilities. State-of-the-art computer facilities and labs are available to students on both campuses. Equipment and software are well-maintained and up-to-date in order to provide full support to M.S.E. students and faculty.

With respect to research and other study needs, M.S.E. students have access to both the John Deaver Drinko library and the South Charleston campus library.

5. Assessment Information

(a) Summarize the principal goals of the assessment program:

The assessment plan for the M.S.E. degree program, which has been updated on a yearly basis, ensures that the M.S.E. degree continues to meet the life-long learning and career enhancements needs of the regional engineering community.

The plan focuses on three elements: ongoing curriculum development, faculty development, and student academic achievement. As a result of focus group meetings with engineering employers, faculty, students, graduates, and advisory
board members, as well as other feedback, a set of six learning outcomes was
developed and is used as the standard for measuring program effectiveness:

- Students meet academic standards and achieve an acceptable level of
technical competence.
- Graduates are valued by employers.
- Graduates can apply management and socio-economic concepts to the
  solution of complex engineering problems.
- Graduates can effectively use computer technology to solve engineering
  problems.
- Graduates can function comfortably in leadership roles and can
  communicate effectively in written, oral and team contexts.
- Graduates are aware of professional, ethical, and legal responsibilities.

Attainment of these outcomes is measured through a combination of student
information, including test scores, professional registration, and academic
progress; faculty/course evaluations; surveys; periodic employer focus group and
other direct feedback mechanisms; and regular review of faculty work plans with
respect to professional community involvement.

(b) Provide summary information on the following elements: Student
outcomes, standards/benchmarks, results/analysis, and action taken.

Chart I Assessment Summary provides the summary of the assessment program
for the M.S.E. degree program, regarding student outcomes,
standards/benchmarks, results/analysis, and action taken.
## Chart I Assessment Summary

**Marshall University**

**Assessment of Student Outcomes: Component/Course/Program Level**

**5 year summary**

**Component Area/Program/Discipline:** Master of Science in Engineering

<table>
<thead>
<tr>
<th>Student Outcome</th>
<th>Person or Office Responsible</th>
<th>Assessment Tool or Approach</th>
<th>Standards/ Benchmark</th>
<th>Results/Analysis</th>
<th>Action Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Academic standards and competence</td>
<td>Engineering Chair and Faculty Advisors</td>
<td>Comprehensive Project; exams and other class assignments</td>
<td>Faculty experience and accepted industry standards</td>
<td>Ongoing identification of areas of concern</td>
<td>Course additions, deletions and modifications</td>
</tr>
<tr>
<td>2. Students are valued by employers</td>
<td>Engineering Faculty</td>
<td>Focus groups and other similar forums; informal professional interactions</td>
<td>Standard industry practices and requirements</td>
<td>Continued approval of MSE program; need for more attention to certain skills</td>
<td>Constant updates to course material and curriculum</td>
</tr>
<tr>
<td>3. Apply management and socio-economic concepts to engineering problems</td>
<td>Engineering Chair and Faculty</td>
<td>Course-specific exams and other evaluation procedures; comprehensive project</td>
<td>Course standards and required learning outcomes; industry standards</td>
<td>Remains a strong part of the MSE program</td>
<td>Continue to emphasize Project Management and related skills</td>
</tr>
<tr>
<td>4. Effective Use of Computer Technology</td>
<td>Engineering Chair and Faculty</td>
<td>Direct and indirect student feedback; employer feedback</td>
<td>Current Standard Computer Tools for Engineering</td>
<td>Computer applications course continued to aid the curriculum; changes/updates to software in other courses</td>
<td>Continued with computer apps course development and add computer components to other courses</td>
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<tr>
<td>5. Effective communication and leadership</td>
<td>Engineering Chair and Faculty</td>
<td>Comprehensive Project; student work in Project Management and other courses</td>
<td>Effective oral and written delivery of projects based on accepted professional practice/ standards</td>
<td>Need to continue to work on this; poses particular challenges with respect to adult students</td>
<td>Course changes; continued emphasis on employer participation in comprehensive project</td>
</tr>
<tr>
<td>6. Aware of professional, ethical, and legal responsibilities</td>
<td>Engineering Chair and Faculty</td>
<td>Employer feedback through focus groups; informal feedback from PE Board and other groups; faculty observation</td>
<td>Standard professional practice and applicable laws, regulations, and codes of PR</td>
<td>Students need additional focus on these aspects of engineering practice</td>
<td>Continued emphasis on courses such as Engineering Law and Management of Technical Human Resources and Organizations; additions to course content</td>
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(c) Provide information on how assessment data are used to improve program quality. Include at least 3 specific examples drawn from the past 5 years.

Educational goals of the program – As reflected in the M.S.E. mission statement, the primary goal of the M.S.E. program is to provide multi-disciplinary, graduate level engineering education appropriate for working professionals and others who do not have the option of full-time programs in a traditional university setting, by providing quality academic instruction and service, life-long learning and career enhancement opportunities to engineers in the region. These goals serve as the basis for the six learning outcomes, identified above.

Measures of evaluating success in achieving goals – It is critical to the continued success of the M.S.E. degree program that program administrators and faculty continually “take the pulse” of the regional engineering community regarding program effectiveness and demonstrate an ability to react quickly and effectively to both market and technological changes. In the past, the most effective measure of this has been informal, but direct feedback, including periodic employer interviews, focus groups, and input from adjunct faculty. In addition, trends in tuition reimbursement provide some insight into industry perceptions of program effectiveness. More traditional instruments, such as surveys, test scores, and student evaluations also are used.

Success in meeting goals – According to the regional engineering community feedback, CITE continues to provide a quality, cost-effective graduate engineering program that is applicable to a wide range of engineering disciplines. Engineering instructors consistently receive favorable evaluations, and most courses are well populated and usually reimbursed by employers. CITE continues to refine its approach to technical writing/communication issues that are often raised by employers, and continues to work on the appropriate mechanisms to teach these skills to working professionals. Graduates of the M.S.E. degree regularly give us feedback following their graduation regarding courses which have been invaluable in their continuing professional work. The EM 660 Project Management and EM 620 Management of Technical Human Resources and Organizations are very frequently mentioned as having had a great value to the students, as are ENGR 610 Applied Statistics EM 675, Engineering Economics (cross-listed with TM 612) and ES 660 Environmental Law.

As mentioned above, the department assessment plan is based on six learning outcomes identified with the assistance of engineering faculty, employers, graduates, and students. These six outcomes reflect skills essential to graduates of the M.S.E. degree program.
Student achievement of these skills is measured through traditional means, such as test scores and academic progress. In addition, the comprehensive project serves as a mechanism for evaluating a student’s grasp of essential principles and also how the student integrates and applies learned skills in the context of a practical engineering problem. Finally, faculty involvement with the local professional community virtually ensures continued interaction with program graduates, as well as the opportunity to observe their performance in a professional setting.

Where possible, assessment information is used to make immediate adjustments to program content or structure. For example, the maturity level of M.S.E. program students usually results in thoughtful commentary on student evaluations regarding course content and its applicability to “real-world” situations. Engineering faculty react to this type of information on a year-to-year basis. In addition, informal feedback from students and/or employers has often resulted in changes in course offerings, both regular and special topics.

With respect to long-term use of assessment data, surveys and employer focus group information are regularly used to evaluate the M.S.E. curriculum.

The M.S.E. degree program, which serves primarily working professionals, owes its continued viability to ongoing program assessment, both anecdotal and formal. Working students and their employers are not likely to support a program that does not continually evolve to meet changing market demands.

Example 1: Feedback regarding the usefulness of TE 698 Comprehensive Project Formulation has given the faculty a big help in deciding recently to completely re-do this course into an online introduction to the CITE graduate programs, expectations, faculty, technical writing, research techniques, Comprehensive Project expectations, and other important tools that CITE graduates need. We feel the new online material will set a new standard for usefulness and accessibility for graduate students not only in the M.S.E. degree, but all of our CITE degrees. This online course is currently being developed and should be ready by the end of Spring 2007.

Example 2: Feedback from students has also caused us to put together an M.S.E. course master plan that allows both faculty and students to know when the courses for the M.S.E. will be taught. This has already tremendously aided both the students and their advisors.

Example 3: Feedback from students has led us to completely re-think the required coursework, electives, and number of hours required for the M.S.E. degree. The faculty in the division are currently discussing the modifications to be made to the program. These changes should be in place for Fall 2007.
(d) **Graduate and Employer Satisfaction:** Provide evidence and results of follow-up studies to indicate graduate and employer satisfaction with the effectiveness of the educational experience. Indicate the number of individuals surveyed or contacted and the number of respondents.

Because of the small number of students in the M.S.E. degree program, graduate and employer satisfaction has been measured informally. Graduate surveys for the M.S.E. program frequently have only one respondent, which makes the survey of little utility. Instead, as thoroughly discussed above, we use focus groups, informal discussions with graduates, course evaluations by current students, suggestions from other faculty and employers, and contacts with other engineers to help us measure the effectiveness of the educational experience of our graduates.

(e) **Attach the previous five years of summary reports provided by the Office of Assessment**

All Assessment Reports have been attached at the end of this Program Review. Please see Appendix VII for those Annual Assessment Reports, and Appendix VIII for the Reviews of those Annual Assessment Reports.

6. **Previous Reviews**

The previous program review report was submitted in December, 2001. Reviewers recommended continuation of the program at all levels. No corrective actions were required.

7. **Strengths/Weaknesses**

The principal strengths of the M.S.E. degree program include its versatile, experienced, multi-disciplinary full-time faculty; its group of qualified, expert, adjunct faculty; its mature, committed, and professional students; and a mission that enables CITE and its Engineering and Computer Science Division to serve the region’s engineering community in a meaningful and necessary way.

The collective faculty—both full-time and adjunct—have many years of relevant work experience and are oriented toward application. They willingly travel throughout the region to deliver the program, and teach at times convenient to the students. They mentor the part-time faculty, and students feel that they teach useful courses extremely well.
M.S.E. students are a major strength of the program. Almost all the students are working in related fields, and many are using advanced technology and systems required to maintain the viability of their various enterprises. This greatly enriches the learning environment in the classroom – students share their experiences, insight and knowledge with classmates and also put substantial pressure on faculty to remain current and to be relevant in the classroom.

Another strength of CITE’s M.S.E. program is location. The Advantage Valley corridor, which includes Charleston and Huntington, includes a concentrated community of engineering professionals employed by the chemical/ manufacturing industry, consulting firms, and government agencies such as the Department of Transportation and Department of Environmental Protection. Most of these employers encourage life-long learning and career enhancement of their employees by providing tuition reimbursement and other support.

The flexibility of CITE and the M.S.E. program to meet students’ needs is a strength identified frequently by students and employers. Within the framework of the required core courses, an engineering field concentration, and electives, plans of study can be tailored to meet the needs of individuals or groups of students. Class hours, class locations, and accessibility of facilities also serve CITE students well.

The weaknesses of the program are related primarily to the unique nature of the program’s mission. Meeting the ever-changing demands of the regional engineering community can be a challenge, and faculty can easily become overwhelmed by non-teaching and non-research responsibility, such as setting up off-site programs and working to accommodate the particular, specific needs of part-time, employed students who often experience conflicts between course and work demands.

The current engineering job market has been very favorable for students, but has had the related effect of inflating adjunct salaries in engineering disciplines. However, because adjunct involvement is a crucial and popular component of the program, CITE will continue to attempt to obtain resources to support the increasing expense of adjuncts.

B. Viability

1. Articulation Agreements

Currently we have no active articulation agreements.

2. Off-Campus Classes/Distance Delivery Classes
In addition to Huntington and South Charleston, the M.S.E. degree program is offered as needed to employees in companies and locations in the state where sufficient demand exists. For example, Alcon, just outside Huntington, has consistently been having M.S.E. and Technology Management courses being taught at their location for the last several years. In the past we have also taught classes in Beckley and Parkersburg, but demand there waned to the point that we could no longer justify teaching in those locations. In addition, CITE occasionally offers engineering courses in Teays Valley. See Appendix III for additional details.

3. Service Courses

Several courses listed under Engineering Management and Environmental Engineering alpha-designators are used as either electives or required courses by students in the Technology Management, Environmental Science, and Safety Technology Programs. In addition, students enrolled in degree programs offered by other colleges often take certain courses in the M.S.E. program, such as Project Management, Operations Management, and Environmental Geotechnology. (See Appendix IV.)

4. Program Course Enrollment

M.S.E. program courses are provided with associated enrollment by semester for five years, beginning with Fall 2001, and ending with Fall 2006. See Appendix V.

5. Enrollment

The data are provided in Appendix VI, beginning with Fall 2001.

6. Enrollment Projections

The M.S.E. degree program has experienced roughly flat to slightly declining enrollment over the past five years. Several factors are playing a roll. First, in the early part of the five year period, there were many reductions in workforce occurring in the chemical engineering field and many working professionals rapidly began updating their educational credentials and training. After a couple of years those people had indeed lost their jobs or were transferred out of state, and we saw an accompanying rapid decline in the number of chemical engineering students—so much so that we have stopped accepting students with a chemical engineering area of emphasis. For the last three years, our enrollment has remained roughly steady, but lower than the first two years of the five-year period covered here (See Appendix VI).
Because most of our students are working full time professionals, enrollment is affected by tuition reimbursement programs in the engineering industry and government bodies. Many of our students are indeed participants in a tuition reimbursement program.

Thus, the willingness of employers to reimburse tuition is a major variable in our enrollment and tends to be related to the larger national economic cycles, making enrollment projections difficult. For now, we feel that our enrollment will remain roughly steady for the next few years.

There is one factor, however, that comes into play here: We have noticed an increase in the number of international students applying to the degree program. It is too early for us to predict the long term effect of this increase in applications form international students, as a higher percentage of the foreign applicants are not meeting our entrance requirements. For now, we feel that our enrollment will remain steady for the next few years.

C. Necessity

1. Advisory Committee

The M.S.E. degree program has had an Advisory Committee which we have used extensively for focus group input and review on the objectives, courses, and mission of both the program and the Engineering and Computer Science division. We have not had a meeting of the advisory committee for a couple of years and it is time that we need to meet again. Our interactions with the advisory committee have given us a great deal of useful feedback and suggestions on the program. The advisory committee has consisted mainly of industrial technical leaders and employers in our region. This has had the added benefit of exposing the program to employers, and thus advertising the degree.

2. Graduates

The vast majority of our graduates continue their jobs in their currently places of employment with engineering and other technical employers. Of those who are not already employed, we have had several go on to doctoral degree programs in engineering, or other professional areas such as law or medicine. The salaries of our graduates are competitive with the other engineering graduates in their fields, which salaries vary somewhat from one engineering discipline to another, but most are earning at least $50,000 per year, and many have much better salaries than that.
3. **Job Placement**

The large majority of M.S.E. program students are part-time students fully employed as engineers with local industries. Prior to graduation, these students usually have identified a new job, promotion, or raise which they hope to achieve as a result of their graduate education.

For those few students who are pursuing the degree full-time, the program provides an excellent opportunity for them to network with working professionals in classes and on projects. Government agency and industry contacts are also used to assist students in finding employment or re-employment.

4. **Similar Programs**

CITE currently offers the only graduate engineering program in West Virginia serving primarily the employed engineer, and historically has been the primary source of graduate engineering education in the State’s southern region. There is no other institution within commuting distance of Huntington, South Charleston, or Beckley that offers an M.S.E. degree program.

Other institutions have periodically expressed an interest in offering graduate engineering programs in Charleston, but such programs have never materialized.

D. **Consistency with Mission**

The Master of Science in Engineering program is designed specifically to implement the mission of Marshall University and Marshall University Graduate College.

The program enhances the economic development of the region by providing continuing education and life-long learning opportunities to educated, working professionals, which assists in the recruitment and retention of these professionals by regional businesses. The expertise of M.S.E. faculty also provides opportunities for collaboration with local industry.

The program and its faculty consistently work at developing new teaching and course delivery methods that provide the maximum results in student learning and performance.

The program makes graduate engineering education accessible to under-served areas of the state and region.

The program shares faculty, courses, and research interests with several other CITE degree programs, including Technology Management and Environmental
Science, and Safety Technology. This has provided many opportunities for cooperation and collaboration on a variety of academic projects, which enriches the learning environment for students and working environment for faculty. In addition, programs and faculty in other colleges are increasingly working with CITE on special projects and directing students to various CITE courses of interest.

E. Program of Excellence

CITE is currently not requesting Program of Excellence designation for the M.S.E. degree program.
APPENDICES

Appendix I: Course Listing
Appendix II: Faculty Data
Appendix III: Off-Campus Classes
Appendix IV: Service Courses
Appendix V: Core Courses in Engineering
Appendix VI: Enrollment Data
Appendix VII: Past Annual Program Assessment Reports
Appendix VIII: Past Annual Program Assessment Reports--Reviews
Appendix I

Course Listing
APPENDIX I
Course Listing

Institution: Marshall University College of Information Technology & Engineering  Person Responsible For Report: Eldon Larsen
Degree Program: MSE--Engineering Management Area of Emphasis

<table>
<thead>
<tr>
<th>Courses Required In Major (by Title and Course Number)</th>
<th>Total Required Hours</th>
<th>Additional Credit Required In Major</th>
<th>Total Hours</th>
<th>Related Fields Courses Required</th>
<th>Total Hours</th>
<th>Required In General Studies/Electives</th>
<th>Total for Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM 660 Project Management</td>
<td>3</td>
<td>EM 620 Management of Technical Human Resources and Organizations</td>
<td>3</td>
<td>Four courses in a related area approved by student's advisor</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGR 610 Applied Statistics</td>
<td>3</td>
<td>EM 675 Engineering Economics (Or TM equivalent)</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGR 620 Computer Applications</td>
<td>3</td>
<td>IE 610 Operations Management</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TE 699 Comprehensive Project Formulation</td>
<td>3</td>
<td></td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TE 699 Comprehensive Project</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>15</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>36 hours</strong></td>
</tr>
</tbody>
</table>

Professional society that may have influenced the program offering and requirements: ASEM, WVSPE, AIChE
# APPENDIX I
## Course Listing

Institution: **Marshall University College of Information Technology & Engineering**  
Person Responsible for Report: **Eldon Larsen**  
Degree Program: **MSE--Environmental Engineering Area of Emphasis**

<table>
<thead>
<tr>
<th>Courses Required In Major (by Title and Course Number)</th>
<th>Total Required Hours</th>
<th>Additional Credit Required In Major</th>
<th>Total Hours</th>
<th>Related Fields Courses Required</th>
<th>Total Hours</th>
<th>Required In General Studies/Electives</th>
<th>Total for Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM 660 Project Management</td>
<td>3</td>
<td>ES 614 Risk Assessment</td>
<td>3</td>
<td>Two elective courses approved by student’s advisor</td>
<td>6</td>
<td>6</td>
<td>36 hours</td>
</tr>
<tr>
<td>ENGR 610 Applied Statistics</td>
<td>3</td>
<td>ENVE 681 Env. Engineering Design</td>
<td>3</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGR 620 Computer Applications</td>
<td>3</td>
<td>ENVE 615 Env. Chemistry</td>
<td>3</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TE 699 Comprehensive Project Formulation</td>
<td>3</td>
<td>ES 660 Env. Law</td>
<td>3</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TE 699 Comprehensive Project</td>
<td>3</td>
<td>One of the following:</td>
<td>3</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>ENVE 611 Air PollutionDesign</td>
<td>15</td>
<td></td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ENVE 680 Air Pollution Dispersion Modeling</td>
<td></td>
<td></td>
<td>15</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>ENVE 683 Environmental Geotechnology</td>
<td></td>
<td></td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ES 640 Groundwater Principles and Monitoring</td>
<td></td>
<td></td>
<td>15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Professional society that may have influenced the program offering and requirements: **AWMA, ASCE**
APPENDIX II

FACULTY DATA
Faculty Data Sheet
(for the period of this review)

Name: Dr. Eldon R. Larsen

Rank: Professor

Status (Check one): Full-time XX Part-time____ Adjunct____ Current MU Faculty: XX yes ____ no

Highest Degree Earned: Ph. D. Date Degree Received: Spring 1983

Conferred by: The University of California at Berkeley

Area of Specialization: Chemical Engineering

Professional Registration/Licensure: Project Management Professional __ Agency: Project Management Institute

<table>
<thead>
<tr>
<th>Years non-teaching experience</th>
<th>16.5</th>
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<tbody>
<tr>
<td>Years of employment other than Marshall</td>
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</tr>
<tr>
<td>Years of employment at Marshall</td>
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</tr>
<tr>
<td>Years of employment in higher education</td>
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</tr>
<tr>
<td>Years in service at Marshall during this period of review</td>
<td>5</td>
</tr>
</tbody>
</table>

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught, course number, course title and enrollment. (Expand the table as necessary)

<table>
<thead>
<tr>
<th>Year/Semester</th>
<th>Alpha Des. &amp; No.</th>
<th>Title</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004/Fall</td>
<td>EM 660</td>
<td>Project Management (Huntington)</td>
<td>22</td>
</tr>
<tr>
<td>2004/Fall</td>
<td>EM 660</td>
<td>Project Management (South Charleston)</td>
<td>12</td>
</tr>
<tr>
<td>2004/Fall</td>
<td>EM 620</td>
<td>Management of Technical Human Resources and Organizations</td>
<td>8</td>
</tr>
<tr>
<td>2004/Fall</td>
<td>ENGR 687</td>
<td>Independent Study</td>
<td>1</td>
</tr>
<tr>
<td>2005/Spring</td>
<td>EM 660</td>
<td>Project Management</td>
<td>16</td>
</tr>
<tr>
<td>2005/Spring</td>
<td>IE 670</td>
<td>Operations Management</td>
<td>14</td>
</tr>
<tr>
<td>2005/Summer</td>
<td>EM 620</td>
<td>Management of Technical Human Resources and Organizations</td>
<td>10</td>
</tr>
<tr>
<td>2005/Summer</td>
<td>EM 660</td>
<td>Project Management</td>
<td>11</td>
</tr>
<tr>
<td>2005/Summer</td>
<td>TM 699</td>
<td>TM Capstone Project</td>
<td>1</td>
</tr>
<tr>
<td>2005/Fall</td>
<td>EM 660</td>
<td>Project Management</td>
<td>17</td>
</tr>
<tr>
<td>2005/Fall</td>
<td>EM 670</td>
<td>Seminar in Engineering Management</td>
<td>5</td>
</tr>
<tr>
<td>2005/Fall</td>
<td>TE 699</td>
<td>Comprehensive Project</td>
<td>3</td>
</tr>
<tr>
<td>2006/Spring</td>
<td>Sabbatical</td>
<td>Sabbatical</td>
<td>-</td>
</tr>
<tr>
<td>2006/Summer</td>
<td>EM 620</td>
<td>Management of Technical Human Resources and Organizations</td>
<td>13</td>
</tr>
<tr>
<td>2006/Summer</td>
<td>EM 660</td>
<td>Project Management</td>
<td>7</td>
</tr>
<tr>
<td>2006/Fall</td>
<td>EM 650</td>
<td>Sp.Tp.: Advanced Project Management</td>
<td>4</td>
</tr>
<tr>
<td>2006/Fall</td>
<td>EM 660</td>
<td>Project Management</td>
<td>12</td>
</tr>
<tr>
<td>2006/Fall</td>
<td>TE 699</td>
<td>Comprehensive Project</td>
<td>1</td>
</tr>
</tbody>
</table>

NOTE: Part-time adjunct faculty does not need to fill in the remainder of this document.

1 If your degree is not in your area of current assignment, please explain.

2 Activities that have enhanced your teaching and or research.
   • November 2006, AIChE National Annual Meeting
   • April 2006, AIChE Spring National Meeting
   • November 2005, AIChE National Annual Meeting
   • April 2005, AIChE Spring National Meeting
   • November 2004, AIChE National Annual Meeting
   • June 2004, ASEE National Meeting
   • April 2004, AIChE Spring National Meeting
   • June 2003, ASEE National Meeting
   • April 2003, AIChE Spring National Meeting
   • October 2002, ASEM National Meeting
   • October 2001, ASEM National Meeting

3 Discipline-related books/papers published (provide a full citation).
4 Papers presented at state, regional, national, or international conferences.


5 Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.

- 2006 Chair of the national Management Division of the American Institute of Chemical Engineers
- 2005 First Vice Chair of the national Management Division of the American Institute of Chemical Engineers
- 2004 Second Vice Chair of the national Management Division of the American Institute of Chemical Engineers
- 2002-2003 Director of the national Management Division of the American Institute of Chemical Engineers
- 2006/2007 Chair of the Charleston Section of the American Institute of Chemical Engineers
- 2005/2006 Vice Chair of the Charleston Section of the American Institute of Chemical Engineers
- 2004/2005 At-Large Member of the Charleston Section of the American Institute of Chemical Engineers
- 2003/2004 At-Large Member of the Charleston Section of the American Institute of Chemical Engineers
- 2002/2003 Past Chair of the Charleston Section of the American Institute of Chemical Engineers
- 2001/2002 Chair of the Charleston Section of the American Institute of Chemical Engineers
- 2000/2001 Vice Chair of the Charleston Section of the American Institute of Chemical Engineers
- 2006 President & CEO of the West Virginia/Ohio Valley Chapter of the Project Management Institute
- 2005 Director-at-Large on the Board of the West Virginia/Ohio Valley Chapter of the Project Management Institute
- 2004 Director-at-Large on the Board of the West Virginia/Ohio Valley Chapter of the Project Management Institute
- 2003 Director-at-Large on the Board of the West Virginia/Ohio Valley Chapter of the Project Management Institute

6 Externally funded research grants and contracts you received.

7 Awards/honors (including invitations to speak in your area of expertise) or special recognition.

- Distinguished Service Award, Charleston Section, AIChE, 5/2006
- I regularly receive requests to speak at local meetings of the AIChE section and PMI chapter (approximate yearly for each)
- Outstanding Graduate Advisor of the Year Award, Marshall University, 5/2004
- The 2003 Outstanding Parents of the Year for the State of West Virginia, with my wife, awarded by the Parents Day Coalition of West Virginia, a project of the American Family Coalition

8 Community service as defined in the Greenbook.

- Lay minister for the Spencer Branch of The Church of Jesus Christ of Latter-day Saints in Spencer, WV
Faculty Data Sheet
(for the period of this review)

Name: Richard F. McCormick

Status (Check one):  Full-time __X__ Part-time _____ Adjunct_____ Current MU Faculty: __X__ yes  __no

Highest Degree Earned: __PhD___________________ Date Degree Received: __July 1979________________

Conferred by: __Virginia Polytechnic Institute and State University, Blacksburg, Virginia____________________

Area of Specialization: __Civil Engineering (Environmental and Hydraulics)__________________________

Professional Registration/Licensure: __Yes___________________ Agency:  WV Board of Registration for Professional Engineers and the WV Board of Registration for Professional Surveyors__________________________

Year/Semester   Alpha Des. & No.   Title            Enrollment

Fall, 2006   ENGR 218   Fluid Mechanics           8
Fall, 2006   CVLE 432   Sanitary Engineering       12
Fall, 2006   CVLE 433   Advanced Hydraulic Engineering 11
Fall, 2006   CVLE 452   Civil Engineering Seminar     14
Fall, 2006   ENVE 615   Environmental Chemistry        6
Fall, 2006   UNI 101    Freshman Seminar           12
Spring, 2006  ENGR 216  Mechanics of Deformable Bodies 13
Spring, 2006  CVLE 431  Hydraulic Engineering       12
Fall, 2005   UNI 101    Freshman Seminar           18
Fall, 2005   ENGR 213  Statics                        28
Fall, 2005   ENGR 218  Fluid Mechanics               12
Fall, 2005   ENVE 615  Environmental Chemistry        12
Spring, 2005  ENGR 214  Dynamics                      14
Spring, 2005  ENGR 216  Mechanics of Deformable Bodies 16

NOTE: Part-time adjunct faculty does not need to fill in the remainder of this document.

1 If your degree is not in your area of current assignment, please explain. N/A

(For each of the following sections, list only events during the period of this review and begin with the most recent activities.

2 Activities that have enhanced your teaching and or research.

(a) Since coming to Marshall in January of 2003, much of my time has been spent in trying to develop a four year undergraduate engineering program including cooperating with WVU Tech in delivering their ABET accredited civil engineering degree to Marshall students. These activities have included teaching 3 new graduate and 10 new undergraduate courses as well as developing all or parts of five laboratories.

(b) In the four years that I have been at Marshall, I have supervised ten master level students through the completion of their degrees and served on numerous examination committees for other graduate students.

(c) During this time, I have developed and administered course assessment tools for all the undergraduate courses that I have taught.

3 Discipline-related books/papers published (provide a full citation).

None

4 Papers presented at state, regional, national, or international conferences.

None

5 Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.

(a) I belong to the American Society of Civil Engineers—I hold no current office
(b) I belong to the American Society for Engineering Education—I hold no current office
(c) On April 21, 2005, I attended the ASCE spring technical conference at WVU
(d) On November 17, 2005, I attended the ASCE fall technical conference at WVU-Tech

Date Created: March 6, 2002
MSE Program Review 10-2006.doc
Office of Program Review and Assessment, Academic Affairs, Marshall University, Huntington, WV 25755
(e) On November 18, 2004, I attended the ASCE fall technical conference at WVU-Tech.
(f) On November 20, 2003, I attended the ASCE fall technical conference at WVU-Tech.

6 Externally funded research grants and contracts you received. None

7 Awards/honors (including invitations to speak in your area of expertise) or special recognition.
   a. June 25, 2002—presented 2 hour seminar to the WV Society of Professional Engineers on technical surveying standards
   b. October 10, 2002—taught the fluids review for the FE (Fundamentals of Engineering) exam for WVU-Tech.
   c. February 6, 2003—taught the fluids review for the PE (Professional Engineering) exam for MUGC.
   d. February 13, 2003—taught the hydraulics review for the PE exam for MUGC.
   e. March 4, 2003—gave presentation with Betsy Dulin on Engineer’s Week to Riverside High School.
   f. March 11, 2003—gave presentation with Bill Pierson on Engineer’s Week to Wayne High School.
   g. March 13, 2003—gave presentation with Betsy Dulin on Engineer’s Week to Hamlin High School.
   h. March 27, 2003—taught the surveying review for the PE exam for MUGC.
   i. May 9, 2003—gave presentation on “tolerance in the workplace” at Riverside High.
   j. February 9, 2004—gave presentation with Betsy Dulin on EEAEE at EPSCOR Day at the legislature
   k. February 23, 2004—gave presentation on EEAEE at Poca High School
   l. February 25, 2004—gave presentation on Engineer’s Week to Teays Valley Christian High School.
   m. February 27, 2004—gave presentation on Engineer’s Week to Huntington High School.
   n. March 3, 2004—gave second presentation on Engineer’s Week to Teays Valley Christian High School to a different class.
   p. March 26, 2004—gave presentation on Engineer’s Week at Huntington St. Joseph’s High School.
   q. May 10, 2004—gave presentation on GPS/Surveying at the RTI Open House to several Wayne County High School students in Huntington.
   r. June 20—25, 2004—gave several presentations at the EEAEE summer camp at Marshall.
   s. October 23, 2004—presented a talk with Dean Betsy Dulin at West Virginia Tech on Marshall’s graduate programs in engineering
   u. January 26, 2005—represented Marshall and CITE at the Dow Building 701 Open House
   v. March 5, 2005—participated in SCORES at Marshall with a session on engineering computations
   w. March 23, 2005—represented Marshall and CITE at the Engineering EXPO in Charleston
   x. April 23, 2005—gave two presentations on engineering careers and Marshall’s engineering programs at Marshall’s Spring Open House
   y. May 11, 2005—gave a presentation to the Athletic Training Department at Concord University on “Factors to be Considered when Designing an Athletic Training Facility Building”
   z. June 18—23, 2005—gave several presentations at the EEAEE summer camp at Marshall
   aa. September 30, 2005—presented 3 hours of professional engineering exam review sessions on hydraulics, hydrology, water and wastewater treatment to 25 engineers preparing to sit for the PE exam. This seminar was organized by the Younger Members Group of the American Society of Civil Engineers and included professors from WVU, WVU Tech and Marshall.
   bb. October 1, 2005—presented 2.5 hours of a professional engineering exam review session on surveying (continuation of Sept 30 event)
   cc. January 24, 2006—attended Joint Engineering Societies meeting at the Dow Technical Center in South Charleston, seminar presentation was on energy.
   dd. February 16, 2006—attended ASCE seminar on Katrina and tsunami surge damage
   ee. March 11, 2006—participated in SCORES at Marshall with a session on engineering computations
   gg. September 1, 2006—attended assessment workshop offered by WVU Tech Civil Engr Department
   hh. September 9, 2006—attended ASCE annual meeting in Shepherdstown, WV
   ii. September 20, 2006—attended seminar on Environmental Sustainability at Dow Technical Park

8 Community service as defined in the Greenbook.
   a. During 2005 I served on two WVU-Tech civil engineering search committees as they were searching for additional faculty to help deliver the cooperative program at Marshall.
   b. I also was asked by my church for engineering advice during some renovations to the church building and the parsonage.
Faculty Data Sheet
(for the period of this review)

Name: D. Scott Simonton  Rank: Associate Prof

Status (Check one):  Full-time ___X__ Part-time _____ Adjunct _____  Current MU Faculty: ___yes ____no

Highest Degree Earned:  PhD __________________________ Date Degree Received: 2002

Conferred by: ___________________________ Univ of New Mexico

Area of Specialization: Environmental Engineering

Professional Registration/Licensure PE __________ Agency: ___WV ________________

Years non-teaching experience __11____

Years of employment other than Marshall __________

Years of employment at Marshall __5____

Years of employment in higher education __5____

Years in service at Marshall during this period of review __5____

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught, course number, course title and enrollment. (Expand the table as necessary)

<table>
<thead>
<tr>
<th>Year/Semester</th>
<th>Alpha Des. &amp; No.</th>
<th>Title</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sp 06</td>
<td>ENVE 625</td>
<td>Hazardous Waste Management</td>
<td>~10</td>
</tr>
<tr>
<td>Fall 05</td>
<td>ENVE 682</td>
<td>Remediation Technologies</td>
<td>~10</td>
</tr>
<tr>
<td>Sp 05</td>
<td>ENVE 681</td>
<td>Env Engineering Design</td>
<td>~8</td>
</tr>
<tr>
<td>Fall 04</td>
<td>ENVE 625</td>
<td>Hazardous Waste Management</td>
<td>~10</td>
</tr>
</tbody>
</table>

NOTE: Part-time adjunct faculty does not need to fill in the remainder of this document.

1 If your degree is not in your area of current assignment, please explain.

(For each of the following sections, list only events during the period of this review and begin with the most recent activities.

2 Activities that have enhanced your teaching and or research.

In an effort to maintain currency in my field, I remain active in consulting, design, etc.

I continue to develop new courses in ES and ENVE, and have developed an e-course, first taught Summer 06, that is a required course in the ENVE/ES programs.

3 Discipline-related books/papers published (provide a full citation).

4 Papers presented at state, regional, national, or international conferences.

5 Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.

Attended International Conference on Greenhouse Gas Control in Vancouver, Canada, Oct 2004

Attended National Association of Environmental Professionals Annual Conference in Albuquerque, NM Apr, 2006

6 Externally funded research grants and contracts you received.

Supporting E-Team Formation in Solving the Economic and Environmental Issues of West Virginia: MIDAS--Turning Ideas into Gold,

Co-PI with professors Logan and Lewis. Funded by National Collegiate Inventors and Innovators Alliance (NCIIA)

Resulted in $13000 in new lab and field equipment for ENVE/ES

7 Awards/honors (including invitations to speak in your area of expertise) or special recognition.

Invited speaker, WV Air and Waste Management Association Annual Conference; “Risk Assessment & Toxicology in the Development of Water Quality Standards”, Sept 2004
Invited speaker, WV Air and Waste Management Association Annual Conference; “Designing the Site Characterization to Meet Risk Assessment Objectives”, Sept 2005

Community service as defined in the *Greenbook*.  
Vice Chairman of WV Environmental Quality Board.  Member, Board of Directors, WV Environmental Institute
Faculty Data Sheet
2006

Name: Thomas D. Hankins

Rank: Professor

Status (Check one): Full-time  X  Part-time  ____  Adjunct  ____  Current MU Faculty:  X  yes  ____  no

Highest Degree Earned:  PhD  Date Degree Received: 1973

Conferred by:  Clark University

Area of Specialization:  Resource management

Professional Registration/Licensure  AICP  Agency:  American Institute of Certified Planners

Years non-teaching experience  4
Years of employment other than Marshall  6
Years of employment at Marshall  33
Years of employment in higher education  29
Years of service at Marshall during this period of review  5

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught, course number, course title and enrollment. (Expand the table as necessary)

<table>
<thead>
<tr>
<th>Year/Semester</th>
<th>Alpha Des. &amp; No.</th>
<th>Title</th>
<th>Enrollment</th>
</tr>
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<tbody>
<tr>
<td>Spring 2006</td>
<td>IS 680</td>
<td>Social Issues in Information Systems</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>IS 680</td>
<td>TE 698</td>
<td>Comprehensive Project Formulation</td>
</tr>
<tr>
<td>Fall 2005</td>
<td>IS 600</td>
<td>Management Information Systems</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>IS 698</td>
<td>TE 698</td>
<td>Comprehensive Project Formulation</td>
</tr>
<tr>
<td>Spring 2005</td>
<td>IS 500</td>
<td>Computer Systems &amp; Structured Programming 1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>IS 600</td>
<td>IS 650</td>
<td>Management Information Systems</td>
</tr>
<tr>
<td></td>
<td>IS 685</td>
<td>IS 685</td>
<td>SpTp: Web Design &amp; Deployment with HTML</td>
</tr>
<tr>
<td>Fall 2004</td>
<td>IS 510</td>
<td>IS 685</td>
<td>Independent Study</td>
</tr>
<tr>
<td></td>
<td>IS 600</td>
<td>IS 600</td>
<td>Management Information Systems</td>
</tr>
<tr>
<td></td>
<td>IS 656</td>
<td>IS 656</td>
<td>Communications and Network Technologies</td>
</tr>
</tbody>
</table>

NOTE: Part-time adjunct faculty does not need to fill in the remainder of this document.

1. If your degree is not in your area of current assignment, please explain.
   My undergraduate major was math. I began teaching programming courses in 1982 and gradually retooled (by taking 30+ hours of credit courses and many CEU’s of non-credit courses) and moved from teaching environmental studies to teaching information systems.

2. Activities that have enhanced your teaching and or research.

3. Discipline-related books/papers published (provide a full citation).

4. Papers presented at state, regional, national, or international conferences.

5. Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.
   American Planning Association
   American Institute of Certified Planners
West Virginia Planning Association

6 Externally funded research grants and contracts you received.
7 Awards/honors (including invitations to speak in your area of expertise) or special recognition.
8 Community service as defined in the *Greenbook*.

- Member of the Putnam County Planning Commission since 1977, chair for 3 years
- Member of the Putnam County Port Authority, chair since 2004
- Active in the Kanawha Valley and Ashland Emmaus communities
- Active in Kairos of West Virginia prison ministry
Faculty Data Sheet
(for the period of this review)

Name: Neal A. Lewis  Rank: Assoc. Professor

Status (Check one): Full-time _X_ Part-time_____ Adjunct_____ Current MU Faculty: _X_ yes ___no

Highest Degree Earned: __Ph.D.________ Date Degree Received: __May 2004____

Conferred by: _University of Missouri - Rolla______________________________

Area of Specialization: Engineering Management__________________________

Professional Registration/Licensure__None________ Agency:_____________________

Years non-teaching experience  __27____
Years of employment other than Marshall  _2____
Years of employment at Marshall  _2____
Years of employment in higher education  _2____
Years in service at Marshall during this period of review  _2____

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught, course number, course title and enrollment. (Expand the table as necessary)

<table>
<thead>
<tr>
<th>Year/Semester</th>
<th>Alpha Des. &amp; No.</th>
<th>Title</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004 Fall</td>
<td>EM 660</td>
<td>Project Management (Shawnee State)</td>
<td>7</td>
</tr>
<tr>
<td>2006 Spring</td>
<td>EM 660</td>
<td>Project Management</td>
<td>9</td>
</tr>
<tr>
<td>2006 Summer</td>
<td>IE 639</td>
<td>Operations Research I</td>
<td>4</td>
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</tbody>
</table>

NOTE: Part-time adjunct faculty does not need to fill in the remainder of this document.

1 If your degree is not in your area of current assignment, please explain.

(For each of the following sections, list only events during the period of this review and begin with the most recent activities.

2 Activities that have enhanced your teaching and or research. (see below)

3 Discipline-related books/papers published (provide a full citation).

4 Papers presented at state, regional, national, or international conferences.

5 Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.
   ASEM Conference, October 2005
   AIChE, Member at Large (officer, local section)

6 Externally funded research grants and contracts you received.
   Logan, Lewis, Simonton. NCIIA grant, “Supporting E-Team Formation in Solving the Economic and Environmental Issues of West Virginia”

7 Awards/honors (including invitations to speak in your area of expertise) or special recognition.
   Outstanding Teaching Commendation Award, Univ. of Missouri – Rolla, April 2005
   Talk to PMI on Real Options Analysis, November 2005
   Talk to Toyota conference on Troubleshooting, December 2005.

8 Community service as defined in the Greenbook.
Faculty Data Sheet
(for the period of this review)

Name: William L. Mankins

Status (Check one): Full-time_____ Part-time_____ Adjunct x_____ Current MU Faculty: x__yes ___no

Highest Degree Earned: Masters Science Engineering___________Date Degree Received: January 1963___________

Conferred by: West Virginia University

Area of Specialization Metallurgical Engineering

Professional Registration/LicensureWV P.E. 5828__________ Agency: WV State Board of Registration for Professional Engineers

| Years non-teaching experience | 44________ |
| Years of employment other than Marshall | 44________ |
| Years of employment at Marshall | ~6________ |
| Years of employment in higher education | ~6________ |

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught, course number, course title and enrollment. (Expand the table as necessary)

<table>
<thead>
<tr>
<th>Year/Semester</th>
<th>Alpha Des. &amp; No.</th>
<th>Title</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001 through 2006, nearly every semester</td>
<td>EM660</td>
<td>Project Management</td>
<td>20/Semester</td>
</tr>
</tbody>
</table>

NOTE: Part-time adjunct faculty does not need to fill in the remainder of this document.

1 If your degree is not in your area of current assignment, please explain.

(For each of the following sections, list only events during the period of this review and begin with the most recent activities.)

2 Activities that have enhanced your teaching and or research.

3 Discipline-related books/papers published (provide a full citation).

4 Papers presented at state, regional, national, or international conferences.

5 Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.

6 Externally funded research grants and contracts you received.

7 Awards/honors (including invitations to speak in your area of expertise) or special recognition.

8 Community service as defined in the Greenbook.
Faculty Data Sheet
(for the period of this review)

Name: Jack Smith
_________________________________

Rank: __________________________________

Status (Check one): Full-time_____ Part-time_____ Adjunct X ____ Current MU Faculty: _X yes ___no

Highest Degree Earned: ___PhD____________________Date Degree Received:___June, 1980_

Conferred by: University of Florida

Area of Specialization: ___Computational Quantum Chemistry and scientific computing in general________

Professional Registration/Licensure__________________________Agency: ________________________________

<table>
<thead>
<tr>
<th>Years non-teaching experience</th>
<th>35 (post BS)</th>
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<tr>
<td>Years of employment other than Marshall</td>
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</tr>
<tr>
<td>Years of employment at Marshall</td>
<td>1+</td>
</tr>
<tr>
<td>Years of employment in higher education</td>
<td>12 (as TA/RA/PostDoc @ UF; Adjunct @ WVSU, MU)</td>
</tr>
<tr>
<td>Years in service at Marshall during this period of review</td>
<td>1+</td>
</tr>
</tbody>
</table>

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught, course number, course title and enrollment. (Expand the table as necessary)

<table>
<thead>
<tr>
<th>Year/Semester</th>
<th>Alpha Des. &amp; No.</th>
<th>Title</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005/Fall</td>
<td>ENGR610</td>
<td>Applied Statistics</td>
<td>12</td>
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<tr>
<td>2006/Spring</td>
<td>ENGR610</td>
<td>Applied Statistics</td>
<td>15</td>
</tr>
<tr>
<td>2006/Fall</td>
<td>ENGR610</td>
<td>Applied Statistics</td>
<td>8</td>
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</tbody>
</table>

NOTE: Part-time adjunct faculty does not need to fill in the remainder of this document.

1 If your degree is not in your area of current assignment, please explain.

(For each of the following sections, list only events during the period of this review and begin with the most recent activities.
2 Activities that have enhanced your teaching and or research.
3 Discipline-related books/papers published (provide a full citation).
4 Papers presented at state, regional, national, or international conferences.
5 Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.
6 Externally funded research grants and contracts you received.
7 Awards/honors (including invitations to speak in your area of expertise) or special recognition.
8 Community service as defined in the Greenbook.)
Faculty Data Sheet
(for the period of this review)

Name: Betsy Ennis Dulin

Rank: Professor

Status (Check one): Full-time______ Part-time______ Adjunct X__ Current MU Faculty: ____yes  X__no

Highest Degree Earned: __Juris Doctor________________________Date Degree Received:____1992___________

Conferred by: Washington & Lee University

Engineering_________________________________________________________

Professional Registration/Licensure________________________Agency:

Registered Professional Engineer: West Virginia Board of Registration for Professional Engineers

Licensed to practice law: Supreme Court of Ohio, West Virginia State Bar


Years non-teaching experience 7

Years of employment other than Marshall 7

Years of employment at Marshall 10

Years of employment in higher education 11

Years in service at Marshall during this period of review 5

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught, course number, course title and enrollment. (Expand the table as necessary)

<table>
<thead>
<tr>
<th>Year/Semester</th>
<th>Alpha Des. &amp; No.</th>
<th>Title</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Part-time adjunct faculty does not need to fill in the remainder of this document.

1 If your degree is not in your area of current assignment, please explain.

(For each of the following sections, list only events during the period of this review and begin with the most recent activities.

2 Activities that have enhanced your teaching and or research.

3 Discipline-related books/papers published (provide a full citation).

4 Papers presented at state, regional, national, or international conferences.

5 Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.

6 Externally funded research grants and contracts you received.

7 Awards/honors (including invitations to speak in your area of expertise) or special recognition.

8 Community service as defined in the Greenbook.
Faculty Data Sheet
(for the period of this review)

Name: William E. Crockett

Rank: Distinguished Professor (Retired)

Status (Check one): Full-time  Part-time  Adjunct  Current MU Faculty: yes  no

Highest Degree Earned: Ph.D.  Date Degree Received: 1962

Conferred by: WVU

Area of Specialization: Chemical Engineering

Professional Registration/Licensure: Professional Engineer (WV)  Agency: WVSPE

Years non-teaching experience: 11
Years of employment other than Marshall: 11
Years of employment at Marshall: 36
Years of employment in higher education: 45
Years in service at Marshall during this period of review: 5

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught, course number, course title and enrollment.

(Expand the table as necessary)

<table>
<thead>
<tr>
<th>Year/Semester</th>
<th>Alpha Des. &amp; No.</th>
<th>Title</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005/Summer</td>
<td>TE 698</td>
<td>Comprehensive Project Formulation</td>
<td>8</td>
</tr>
<tr>
<td>2004/Fall</td>
<td>ENGR 620</td>
<td>Computer Applications</td>
<td>3</td>
</tr>
<tr>
<td>2004/Fall</td>
<td>TE 698</td>
<td>Comprehensive Project Formulation</td>
<td>16</td>
</tr>
<tr>
<td>2004/Spring</td>
<td>ENGR 620</td>
<td>Computer Applications</td>
<td>8</td>
</tr>
<tr>
<td>2004/Spring</td>
<td>ChE 675</td>
<td>Special Topics</td>
<td>2</td>
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<tr>
<td>2004/Spring</td>
<td>ChE 645</td>
<td>Chemical Reactions</td>
<td>1</td>
</tr>
<tr>
<td>2004/Spring</td>
<td>TE 698</td>
<td>Comprehensive Project</td>
<td>6</td>
</tr>
<tr>
<td>2004/Summer</td>
<td>ENGR 620</td>
<td>Computer Applications</td>
<td>5</td>
</tr>
</tbody>
</table>

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught, course number, course title and enrollment.

(Expand the table as necessary)

<table>
<thead>
<tr>
<th>Year/Semester</th>
<th>Alpha Des. &amp; No.</th>
<th>Title</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005/Summer</td>
<td>TE 698</td>
<td>Comprehensive Project Formulation</td>
<td>8</td>
</tr>
<tr>
<td>2004/Fall</td>
<td>ENGR 620</td>
<td>Computer Applications</td>
<td>3</td>
</tr>
<tr>
<td>2004/Fall</td>
<td>TE 698</td>
<td>Comprehensive Project Formulation</td>
<td>16</td>
</tr>
<tr>
<td>2004/Spring</td>
<td>ENGR 620</td>
<td>Computer Applications</td>
<td>8</td>
</tr>
<tr>
<td>2004/Spring</td>
<td>ChE 675</td>
<td>Special Topics</td>
<td>2</td>
</tr>
<tr>
<td>2004/Spring</td>
<td>ChE 645</td>
<td>Chemical Reactions</td>
<td>1</td>
</tr>
<tr>
<td>2004/Spring</td>
<td>TE 698</td>
<td>Comprehensive Project</td>
<td>6</td>
</tr>
<tr>
<td>2004/Summer</td>
<td>ENGR 620</td>
<td>Computer Applications</td>
<td>5</td>
</tr>
</tbody>
</table>

NOTE: Part-time adjunct faculty does not need to fill in the remainder of this document.

1. If your degree is not in your area of current assignment, please explain.

2. Activities that have enhanced your teaching and or research.

   I developed the ENGR 620 course as a WebCT course

3. Discipline-related books/papers published (provide a full citation).

4. Papers presented at state, regional, national, or international conferences.

5. Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.

6. Externally funded research grants and contracts you received.

7. Awards/honors (including invitations to speak in your area of expertise) or special recognition.

8. Community service as defined in the Greenbook.
**Faculty Data Sheet**
(for the period of this review)

Name: **William Pierson**  
Rank: **Professor**

Status (Check one):  
- Full-time _X_  
- Part-time  
- Adjunct  
Current MU Faculty: _X_ yes  
_no

Highest Degree Earned: Ph. D.  
Date Degree Received: _May, 1976_

Conferred by: **University of Missouri - Rolla**

Area of Specialization: **Electrical Engineering**

<table>
<thead>
<tr>
<th>Professional Registration/Licensure</th>
<th>Yes</th>
<th>Agency: WV Professional Engineer (#6740)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years non-teaching experience</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Years of employment other than Marshall</td>
<td>37</td>
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</tr>
<tr>
<td>Years of employment at Marshall</td>
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</tr>
<tr>
<td>Years of employment in higher education</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Years in service at Marshall during this period of review</td>
<td>6.5</td>
<td></td>
</tr>
</tbody>
</table>

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught, course number, course title and enrollment. (Expand the table as necessary)

<table>
<thead>
<tr>
<th>Year/Semester</th>
<th>Alpha Des. &amp; No.</th>
<th>Title</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005 / Spring</td>
<td>ENGR111-202</td>
<td>CS For Engineers</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>ENGR221-201</td>
<td>Engineering Economics</td>
<td>17</td>
</tr>
<tr>
<td>2005/Fall</td>
<td>HON101-102</td>
<td>Intro. To Honors</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>ENGR107-101</td>
<td>Intro. To Engineering (team taught, 51%)</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>ENGR107-102</td>
<td>Intro. To Engineering (team taught, 51%)</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>ENGR201-101</td>
<td>Circuits I</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>ENGR221-101</td>
<td>Engineering Economics</td>
<td>24</td>
</tr>
<tr>
<td>2006/Spring</td>
<td>ENGR111-202</td>
<td>CS For Engineers</td>
<td>20</td>
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<tr>
<td></td>
<td>ENGR204-201</td>
<td>Digital Systems</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>ENGR221-201</td>
<td>Engineering Economics</td>
<td>17</td>
</tr>
<tr>
<td>2006 / Fall</td>
<td>HON101-102</td>
<td>Intro. To Honors</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>ENGR107-101</td>
<td>Intro. To Engineering (team taught, 51%)</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>ENGR107-102</td>
<td>Intro. To Engineering (team taught, 51%)</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>ENGR201-101</td>
<td>Circuits I</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>ENGR221-101</td>
<td>Engineering Economics</td>
<td>15</td>
</tr>
</tbody>
</table>

NOTE: Part-time adjunct faculty does not need to fill in the remainder of this document.

1. If your degree is not in your area of current assignment, please explain. **N/A**

2. Activities that have enhanced your teaching and or research.  
   **Participation on the NCEES FE Exam Committee**

3. Discipline-related books/papers published (provide a full citation). **None**

4. Papers presented at state, regional, national, or international conferences. **None**

5. Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations.  
   - I am a member and Vice-Chair of the NCEES FE Exam Committee. This group meets about four times per year in Clemson, SC to produce a nationally-normed exam taken by about 35,000 engineering candidates  
   - In December 2005 I was appointed to WV PE Board by the governor of WV.

6. Externally funded research grants and contracts you received.  
   **Summer Engineering Academy, 2005 and 2006, funded by RTI and external donations; total budget approximately $70,000 each summer**

7. Awards/honors (including invitations to speak in your area of expertise) or special recognition. **None**

8. Community service as defined in the **Greenbook**. **None**
Faculty Data Sheet
(for the period of this review)

Name: James Joseph Fuller
Rank: Associate Professor

Status (Check one): Full-time, Part-time, Adjunct
Current MU Faculty: Yes, No

Highest Degree Earned: MA Date Degree Received: 1975

Conferred by: Marshall University
Area of Specialization: Mathematics

Professional Registration/Licensure
Agency:

Years non-teaching experience 2
Years of employment other than Marshall 24
Years of employment at Marshall 3
Years of employment in higher education 27
Years in service at Marshall during this period of review 2

List courses you taught during the final two years of this review. If you participated in a team-taught course, indicate each of them and what percentage of the course you taught. For each course include the year and semester taught, course number, course title and enrollment. (Expand the table as necessary)

<table>
<thead>
<tr>
<th>Year/Semester</th>
<th>Alpha Des. &amp; No.</th>
<th>Title</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2004</td>
<td></td>
<td>Statistics for Engineers</td>
<td>15</td>
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<tr>
<td>Spring 2005</td>
<td></td>
<td>Statistics for Engineers</td>
<td>15</td>
</tr>
</tbody>
</table>

NOTE: Part-time adjunct faculty does not need to fill in the remainder of this document.

1 If your degree is not in your area of current assignment, please explain.

(For each of the following sections, list only events during the period of this review and begin with the most recent activities)

2 Activities that have enhanced your teaching and or research:
   I served as a consultant to Spatial Integrated Systems of Rockville, MD in Artificial Intelligence and Computer Graphics

3 Discipline-related books/papers published (provide a full citation).

4 Papers presented at state, regional, national, or international conferences:
   I presented two papers at the 2005 IASTED conference on machine vision. These papers were co-authored by colleagues at Spatial Integrated Systems.

5 Professional development activities, including professional organizations to which you belong and state, regional, national, and international conferences attended. List any panels on which you chaired or participated. List any offices you hold in professional organizations. I am a member of the Association of Computing Machinery. This is the professional organization for computing professionals.

6 Externally funded research grants and contracts you received.

7 Awards/honors (including invitations to speak in your area of expertise) or special recognition.

8 Community service as defined in the Greenbook.
APPENDIX III

OFF-CAMPUS CLASSES
## Appendix III
### Off-Campus Classes

(Note: List courses offered at locations other than the Huntington Campus, or the South Charleston Campus.) Please include the courses offered in the past 2 years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Location</th>
<th>Courses Offered</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2004</td>
<td>Alcon</td>
<td>EM 620</td>
<td>8</td>
</tr>
<tr>
<td>Fall 2004</td>
<td>Shawnee State University, Portsmouth, Ohio</td>
<td>EM 660</td>
<td>7</td>
</tr>
<tr>
<td>Spring 2005</td>
<td>Shawnee State University, Portsmouth, Ohio</td>
<td>ENGR 610</td>
<td>2</td>
</tr>
<tr>
<td>Fall 2005</td>
<td>Alcon</td>
<td>ENGR 610</td>
<td>7</td>
</tr>
<tr>
<td>Spring 2003</td>
<td>Alcon</td>
<td>TM 612 cross-list w/ EM 675</td>
<td>8</td>
</tr>
</tbody>
</table>
APPENDIX IV

SERVICES COURSES
## Appendix IV
### Service Courses

<table>
<thead>
<tr>
<th></th>
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<td></td>
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<td>Fa</td>
<td>Sp</td>
<td>Su</td>
<td>Fa</td>
<td>Sp</td>
</tr>
<tr>
<td>EM 660</td>
<td>Project Management</td>
<td>38</td>
<td>40</td>
<td>18</td>
<td>43</td>
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</tr>
<tr>
<td>ENGR 610</td>
<td>Applied Statistics</td>
<td>23</td>
<td>14</td>
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<tr>
<td>IE 670</td>
<td>Operations Management</td>
<td>8</td>
<td>9</td>
<td></td>
<td></td>
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<tr>
<td>ENVE 625</td>
<td>Hazardous Waste Management</td>
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</table>
APPENDIX V

PROGRAM COURSE ENROLLMENT
## Appendix V
### Program Course Enrollment

<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fa</td>
<td>Sp</td>
<td>Su</td>
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<tr>
<td>EM 620</td>
<td>Management of Technical H.R. &amp; Orgs.</td>
<td>Required¹</td>
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<td>EM 650</td>
<td>Special Topics</td>
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<td>EM 660</td>
<td>Project Management</td>
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<tr>
<td>EM 661</td>
<td>Advanced Project Management</td>
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<tr>
<td>EM 670</td>
<td>Seminar in Engineering Management</td>
<td>Elective</td>
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<tr>
<td>TM 612*</td>
<td>Economic and Financial Analysis for Technology Management</td>
<td>Required¹</td>
<td>22</td>
<td></td>
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<tr>
<td>ENGR 610</td>
<td>Applied Statistics</td>
<td>Core Required</td>
<td>23</td>
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<td>ENGR 620</td>
<td>Computer Applications</td>
<td>Core Required</td>
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<td>ENGR 687</td>
<td>Independent Study</td>
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<tr>
<td>TE 698*</td>
<td>Comprehensive Project Formulation</td>
<td>Core Required</td>
<td>22</td>
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<td>TE 699*</td>
<td>Comprehensive Project</td>
<td>Core Required</td>
<td>9</td>
<td>24</td>
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</table>

*TE 698 and 699 are courses required for the M.S.E, M.S.E.S, and I.S. degrees, and totals shown here include all three degree enrollments.

Fa = Fall, Sp = Spring, Su = Summer

¹ Required for M.S.E, M.S.E.S, and I.S. degrees.
### Appendix V—Program Course Enrollment Report (Continued)

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>ENVE 615</td>
<td>Environmental Chemistry</td>
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<td>ENVE 616</td>
<td>Principles of Biological Waste Treatment</td>
<td>Elective</td>
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<tr>
<td>ENVE 617</td>
<td>Physiochemical Treatment of Water and Wastewater</td>
<td>Elective</td>
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<td>4</td>
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<tr>
<td>ENVE 625</td>
<td>Hazardous Waste Management</td>
<td>Elective</td>
<td></td>
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<td>8</td>
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<tr>
<td>ENVE 650</td>
<td>Sp.Tp.</td>
<td>Elective</td>
<td>10</td>
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<tr>
<td>ENVE 680</td>
<td>Air Pollutant Dispersion and Meteorological Modeling</td>
<td>Elective</td>
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<tr>
<td>ENVE 681</td>
<td>Environmental Engineering Design</td>
<td>Required&lt;sup&gt;※&lt;/sup&gt;</td>
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<td>11</td>
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<td>ENVE 682</td>
<td>Environmental Remediation Technologies</td>
<td>Elective</td>
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<td>ENVE 683</td>
<td>Environmental Geotechnology</td>
<td>Elective</td>
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<tr>
<td>ES 660</td>
<td>Environmental Law I</td>
<td>Required&lt;sup&gt;※&lt;/sup&gt;</td>
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<td>25</td>
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<td>31</td>
<td>24</td>
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<tr>
<td>ES 614</td>
<td>Environmental Risk Assessment</td>
<td>Required&lt;sup&gt;※&lt;/sup&gt;</td>
<td>32</td>
<td>29</td>
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</tbody>
</table>

**Footnotes:**  
<sup>1</sup> Engineering Management requirement;  
<sup>2</sup> Environmental Engineering requirement

(Note: If you listed courses in Appendix IV, do not list them again in this appendix.)

* Indicate all courses other than the service courses here. Please include all special topics courses offered as well as independent studies. When listing Independent studies, please list the number of independent study students enrolled, but DO NOT include individual names or the titles of the independent studies.)
# APPENDIX VI

## ENROLLMENT DATA

<table>
<thead>
<tr>
<th>Year</th>
<th>Applications</th>
<th>Admissions</th>
<th>Enrollees</th>
<th>Graduates</th>
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<tr>
<td>2001-2002</td>
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<td>17</td>
<td>36</td>
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<tr>
<td>2002-2003</td>
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<td>12</td>
<td>45</td>
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<tr>
<td>2003-2004</td>
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<td>8</td>
<td>33</td>
<td>15</td>
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<tr>
<td>2004-2005</td>
<td>9</td>
<td>8</td>
<td>30</td>
<td>14</td>
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<tr>
<td>2005-2006</td>
<td>14</td>
<td>9</td>
<td>25</td>
<td>15</td>
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</tbody>
</table>
APPENDIX VII

PAST ANNUAL PROGRAM ASSESSMENT REPORTS
I. Assessment Activities

A. Program Goals

The College of Information Technology and Engineering (CITE) has developed the following program objectives for the Master of Science in Engineering (MSE) degree:

- Provide a graduate engineering program with a strong, focused central core, with opportunities for concentrated study in engineering disciplines important to the region and that currently include chemical engineering, environmental engineering, and engineering management.
- Provide a program that meets the evolving needs of engineers and their employers in the region by enhancing technical engineering competence, management and leadership skills, and sensitivity to legal and ethical issues.
- Continuously monitor, evaluate, and revise existing academic programs through interactions with students and employers.
- Employ technology and other mechanisms to increase learning opportunities and make the program available and accessible at all locations in the region where sufficient demand exists.
- Take a leadership role in fostering the technological and economic development of the region by providing technological resources and professional development opportunities to the community and by developing a reputation for high-quality outcomes.
- Provide support for faculty to enhance competence and currency.
  - Expose students to the managerial, legal, political and ethical issues commonly associated with the practice of engineering.

These objectives were developed in 1999 and have not changed during the reporting period. Various members of the professional engineering community and the engineering faculty continue to review and validate the goals, as discussed below.

B. Learning Outcomes/Data Collection

1. Outcome: Students meet academic standards and achieve acceptable levels of technical competence.
During the reporting period, CITE’s Engineering Division included five full-time faculty, assisted by three adjunct faculty members with education and expertise in relevant fields. In addition, the Engineering Division budget and structure became more well-defined, and faculty hires in the other two CITE divisions included Ph.D. engineers who have been able to add their talents to the MSE program on a part-time basis. This has resulted in increased attention and adherence to academic standards. Engineering Division faculty have taken a much more active role in consistent preparation, review and updating of program curriculum, as well as course content and syllabi. The increased availability of this type of information on CITE’s web page have aided in this process.

Strengths and weaknesses of the curriculum were assessed through formal and informal interactions with faculty, current and former students, and the professional engineering community. The formal graduate survey process conducted by Marshall continues to be a seemingly ineffective assessment tool for programs comprised of working, adult students. Informal processes, including focus group meetings, course evaluations, and direct daily communication with students tends to work best.

Faculty members continue to work toward a more consistent mechanism for assessing the student comprehensive projects. Changes were made to the project proposal, report, and content guidelines during the reporting period to strengthen the comprehensive project component, which serves as an important assessment tool just prior to graduation.

2. Outcome: Graduates are valued by employers.

CITE once again conducted a focus group of regional engineering employers in September, 2001. They represented various engineering disciplines including civil, environmental, chemical, electrical, and industrial engineering.

The employers provided information on the skills they most highly value in their engineering employees. As a group, they like the approach of a general degree with areas of emphasis that can be readily changed or modified to meet rapidly changing market demands. They voiced approval of recent program innovations in computer programming and modeling, but would like their employees to have stronger business, political, and communications skills.

CITE’s Engineering Division has responded to this feedback through continued work with faculty from CITE’s other divisions on the TE 698 course (technical communications and preparation for final project), and by making several changes/additions to the MSE curriculum.

3. Outcome: Graduates can apply management and socio-economic concepts to the solution of complex engineering problems.

Faculty continued to work toward this outcome through incorporation of new materials into
existing technical courses, and through the addition of and/or increased attention to supporting courses such as Engineering Law, Technical Human Resources, and an Engineering Management Seminar. The success of this approach is being assessed primarily through faculty observation of student outcomes based on written assignments and class discussions.

4. **Outcome:** *Graduates can effectively use computer technology to solve engineering problems.*

Feedback on this item comes primarily from the students, most of whom play active roles in the professional engineering community. CITE rolled out a new course, ENGR 620 – Computer Applications, early in the last reporting period. Since that time, and during this reporting period, engineering faculty have modified and enhanced the course content and delivery mechanism based on direct information from students and employers on current technology and software usage. The course now includes a significant web-based component, and the software and problems used in the course have constantly changed to keep pace with industry needs.

5. **Outcome:** *Graduates can function comfortably in leadership roles and can communicate effectively in written, oral, and team contexts.*

Based on direct feedback from students in the form of interaction with graduate Engineering faculty and course evaluations, as well as employer requests and input during the focus group meeting, CITE implemented two new courses during the reporting period – Human Resources in the Technical Environment and Engineering Management Seminar. The former covers organizational behavior as well as traditional human resources issues, but in a context more directly applicable to an engineering environment. The latter explores current management literature, including leadership, and provides opportunities for discussion and analysis in written and oral contexts.

6. **Outcome:** *Graduates are aware of professional, ethical, and legal responsibilities.*

CITE increased the availability of the Engineering Law course, based on assessment referenced in the last reporting period that exhibited a general need for enhanced attention to this topic. The course content was also revised to include more covered of professional responsibility. CITE continues to obtain input on these needs through formal and professional relationships with groups such as the State Board of Registration for Professional Engineers and the National Council of Examiners for Engineering and Surveying.

**C. Results**

The results of our annual and ongoing assessment activities are embedded in the discussions
above, but in general, the following changes were made:

- Two new courses were added to the Engineering Management curriculum.
- The new Computer Applications course undergoes change and enhancement on a semester-by-semester basis, based on changes in the industry and in the mix of students taking the course.
- TE 698 and TE 698, Comprehensive Project Formulation and Comprehensive Project, were changed to provide increased emphasis on communication (with assistance of individuals trained in this field) and more consistency and rigor in the final project.

CITE continues to find during assessment activities that the format of the MSE degree – a central core with opportunities for more concentrated study in areas of emphasis – remains an effective way to deliver a graduate engineering degree in this region, especially to working professionals. Based on employer feedback, CITE plans to continue the emphasis on project management and related topics.

II. Plans for the Current Year

CITE will assess the potential and need for the addition of new areas of emphasis to the MSE degree program, especially in connection with the proposed addition of an undergraduate engineering degree program. This process will involve a series of working groups comprised of engineering employers, practicing engineers, students, and faculty, and should commence during the next reporting period (although we do not expect to complete this process by the end of the reporting period).

We will continue to make short-term modifications based on daily informal assessment processes.

III. Assistance Needed

In general, engineering faculty need more formalized training on assessment methodology and procedures, especially those currently approved by the Accreditation Board for Engineering and Technology. This will be mandatory if CITE obtains approval for developing an undergraduate program, and will require significant additional resources.

IV. Most Important Lesson Learned

As we have reported in the past, many traditional methods of assessing the effectiveness of engineering degree programs do not work in the context of our adult students who are, for the most part, employed full-time and pursuing graduate education on a part-time basis. For instance, passage rates on the Fundamentals of Engineering and the Principles
and Practices examinations (exams to obtain professional engineering registration) are used by most other institutions as part of their assessment plans for engineering. However, many of our students are registered professional engineers (or well on their way toward it) when they enter the MSE degree program. In addition, former students who obtained their degrees on a part-time basis usually do not have a strong attachment to this institution and, as a result, it is often difficult or impossible to obtain usable amounts of survey information. Consequently, we have no formal way of following their careers.

We have learned, though, that if we work a little harder at alumni and employer outreach, we can obtain invaluable feedback through less formal, non-traditional mechanisms. With respect to the substance of the MSE program, we have learned that the engineering community is generally pleased with the program, but expects virtually constant updates and revisions to effectively meet their needs.
### Assessment of Student Outcomes: 2001-2002

**Program: MS Engineering**

<table>
<thead>
<tr>
<th>Component / Course / Program Level</th>
<th>Student Outcome</th>
<th>Person or Office Responsible</th>
<th>Assessment Tool or Approach</th>
<th>Standards/Benchmark</th>
<th>Results/Analysis</th>
<th>Action Taken</th>
</tr>
</thead>
</table>
| 1. Academic Standards and Competence | Engineering Chair and Faculty Advisors  
2. Students Valued By Employers | Engineering Faculty                | Comprehensive Project; exams and other class assignments  
Focus groups and other similar forums; informal professional interactions | Faculty experience and accepted industry standards  
Standard industry practices and requirements | Ongoing identification of areas of concern  
Continued approval of MSE program; need for more attention to certain skills | Course additions and modifications  
Constant updates to course material and curriculum |
<p>| 3. Apply management and socio-economic concepts to engineering problems | Engineering Chair and Faculty | Course-specific exams and other evaluation procedures; comprehensive project | Course standards and required learning outcomes; industry standards | Remains a strong part of the MSE program | Continue to emphasize Project Management and related skills |</p>
<table>
<thead>
<tr>
<th>4. Effective Use of Computer Technology</th>
<th>Engineering Chair and Faculty</th>
<th>Direct and indirect student feedback; employer feedback</th>
<th>Current Standard Computer Tools for Engineering</th>
<th>New computer applications course has significantly improved the curriculum; course requires constant updating to maintain currency</th>
<th>Continue with computer apps course development and add additional computer components to other courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Effective communication and leadership</td>
<td>Engineering Chair and Faculty</td>
<td>Comprehensive Project; other coursework</td>
<td>Effective oral and written delivery of project based on accepted professional practice/standards</td>
<td>Need to continue to work on this; poses particular challenges with respect to adult students</td>
<td>Changes to TE698/699 courses and guidelines; addition of new EM course</td>
</tr>
<tr>
<td>6. Aware of professional, ethical, and legal responsibilities</td>
<td>Engineering Chair and Faculty</td>
<td>Employer feedback through focus groups; informal feedback from PE Board and other groups; faculty observation</td>
<td>Standard professional practice and applicable laws, regulations, and codes of PR</td>
<td>Students need additional focus on these aspects of engineering practice</td>
<td>Increased emphasis on courses such as Engineering Law; additions to course content</td>
</tr>
</tbody>
</table>
PROGRAM ASSESSMENT REPORT

2002-2003 Academic Year

Master of Science in Engineering

Marshall University
College of Information Technology and Engineering

Division of Engineering
III. Assessment Activities

B. Program Goals

The College of Information Technology and Engineering (CITE) has developed the following program objectives for the Master of Science in Engineering (MSE) degree:

- Provide a graduate engineering program with a strong, focused central core, with opportunities for concentrated study in engineering disciplines important to the region and that currently include chemical engineering, environmental engineering, and engineering management.
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- Continuously monitor, evaluate, and revise existing academic programs through interactions with students and employers.
- Employ technology and other mechanisms to increase learning opportunities and make the program available and accessible at all locations in the region where sufficient demand exists.
- Take a leadership role in fostering the technological and economic development of the region by providing technological resources and professional development opportunities to the community and by developing a reputation for high-quality outcomes.
- Provide support for faculty to enhance competence and currency.
  - Expose students to the managerial, legal, political and ethical issues commonly associated with the practice of engineering.

These objectives were developed in 1999 and have not changed during the reporting period. Various members of the professional engineering community and the engineering faculty continue to review and validate the goals, as discussed below.

B. Learning Outcomes/Data Collection

1. Outcome: Students meet academic standards and achieve acceptable levels of technical competence.
During the reporting period, CITE’s Engineering Division hired one additional full-time faculty member, with extensive expertise and experience in one of the MSE’s area of emphasis, and contracted with several new adjunct faculty. In addition to the five full-time faculty members and adjuncts in the Engineering Division, the program continued to utilize the talents and skills of several other Ph.D. engineers in other CITE divisions, including a newly hired Computer Science faculty member with an engineering background.

During the reporting period, Engineering Division faculty met more regularly with the program’s advisory group and with adjunct faculty who work as engineers in the region. In addition, students in MSE courses answered supplemental questions at the end of the semester, in connection with faculty evaluation, that related to course content and overall program effectiveness. These surveys were retained in the Division and are being used to make decisions about current and future course offerings and content.

Informal and immediate feedback from working professional graduate students continues to play a major role in assessing the program’s technical strengths and weaknesses. As noted in previous updates, the formal graduate survey process conducted by Marshall continues to be a seemingly ineffective assessment tool for programs comprised of working, adult engineering students. Informal processes, including focus group meetings, course evaluations, and direct daily communication with students continues to provide the most useful information to chairs, faculty and program coordinators.

As a result of the feedback obtained, program faculty have made adjustments to course coverage in certain cases, and have decided to embark on a general review of the program with an ultimate goal of eliminating and/or adding areas of emphasis that accurately reflect the current and changing engineering population in the Advantage Valley, which fluctuates with changes in the regional economy. For instance, the number of chemical engineers is increasing while the number of civil and transportation engineers remains much more stable and increasing.

Faculty members also remained diligent regarding changes to the comprehensive project made during the last reporting period. Feedback from students and employers has been positive, and the project has been strengthened as an evaluation tool.

2. Outcome: 

Graduates are valued by employers.

CITE met with a focus group of industry professionals during the reporting period, comprised of advisory group members and adjuncts, with several other invited guests.

The employers valued the practical, applied approach of the MSE program, but continue to voice a need for additional education in communication and business. As a result of these comments and informal feedback, CITE has begun to further develop new courses that have their origins in business, but with engineering applications, such as a new human resources course for the engineering management program that focuses on the management of technical professionals. Students have also been encouraged to consider
courses in finance and management in CITE’s Technology Management graduate program as electives.

3. Outcome: Graduates can apply management and socio-economic concepts to the solution of complex engineering problems.

Faculty continued to work toward this outcome through incorporation of new materials into existing technical courses, and through the addition of and/or increased attention to supporting courses such as Project Management, Engineering Law, Human Resources, and an Engineering Management Seminar. The success of this approach is being assessed primarily through faculty observation of student outcomes based on written assignments and class discussions. In addition, feedback from students on faculty evaluations and additional survey questions indicates that they see this area as one of the program’s primary strengths.

4. Outcome: Graduates can effectively use computer technology to solve engineering problems.

Based on focus group and advisory board input, as well as suggestions from students, faculty continue to update software applications within MSE courses that make use of modeling, scheduling, numerical and statistical analysis, and related subjects.

5. Outcome: Graduates can function comfortably in leadership roles and can communicate effectively in written, oral, and team contexts.

These skills are assessed through employer feedback and through a variety of presentations and group projects in courses such as Project Management and required technical courses. No changes were made during the reporting period based on this information.

6. Outcome: Graduates are aware of professional, ethical, and legal responsibilities.

This outcome is assessed based on student performance in courses such as Engineering Law, and from their own comments regarding program effectiveness. No changes were made in this area during the reporting period.

C. Results

The results from informal and formal assessment are as follows:

- Course content changes were made each semester in accordance with changing student demographic and course evaluations.
- A curriculum review process was initiated to assess the effectiveness and currency of current areas of emphasis.
• CITE’s Assistant Dean has become more involved in the development of an assessment program, and will be attending various conferences and training sessions in this regard.

• Near the end of the current reporting period, CITE formed an ad hoc assessment committee, chaired by program faculty from the MSE program, to develop a more structured assessment model for all engineering and computer science, and related programs in the college. The group has not completed its work, but will develop a model consistent with university goals and with specialized program assessment requirements mandated by the Accreditation Board for Engineering and Technology.

IV. Plans for the Current Year

CITE will continue to work on a college-wide assessment model, and plans to reach a final decision on the need for the addition or deletion of areas of emphasis to the MSE degree program. This work will be impacted by the planned implementation of proposed undergraduate computer science and engineering programs.

It is expected that many more individuals from the regional engineering community will become involved in program and curriculum planning.

We will continue to make short-term modifications based on weekly informal assessment processes and written student comments on semester course evaluations. Working graduate students tend to go beyond assessing the performance of particular faculty members and make a variety of insightful and detailed comments regarding course effectiveness and content during the evaluation process.

III. Assistance Needed

As always, faculty require more funding and release time in order to pay meaningful attention to the development of a new assessment plan for CITE.

IV. Most Important Lesson Learned

As we have reported in the past, many traditional methods of assessing the effectiveness of engineering degree programs do not work in the context of our adult students who are, for the most part, employed full-time and pursuing graduate education on a part-time basis. For a variety of reasons, graduates of the MSE program, most of whom attending part-time while working, do not remain “attached” to the institution or faculty, and do no complete survey instruments, etc.

Our most important means of assessing program effectiveness is through daily
interactions with our students, in the form of class requirements or informal feedback that our students, more than most, are very proactive and aggressive about providing.
### Assessment of Student Outcomes: 2003-2003

**Program: MS Engineering**

<table>
<thead>
<tr>
<th>Student Outcome</th>
<th>Person or Office Responsible</th>
<th>Assessment Tool or Approach</th>
<th>Standards/Benchmark</th>
<th>Results/Analysis</th>
<th>Action Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Academic Standards and Competence</td>
<td>Engineering Chair and Faculty Advisors</td>
<td>Comprehensive Project; exams and other class assignments</td>
<td>Faculty experience and accepted industry standards</td>
<td>Ongoing identification of areas of concern</td>
<td>Course additions, deletions and modifications</td>
</tr>
<tr>
<td>2. Students Valued By Employers</td>
<td>Engineering Faculty</td>
<td>Focus groups and other similar forums; informal professional interactions</td>
<td>Standard industry practices and requirements</td>
<td>Continued approval of MSE program; need for more attention to certain skills</td>
<td>Constant updates to course material and curriculum</td>
</tr>
<tr>
<td>3. Apply management and socio-economic concepts to engineering problems</td>
<td>Engineering Chair and Faculty</td>
<td>Course-specific exams and other evaluation procedures; comprehensive project</td>
<td>Course standards and required learning outcomes; industry standards</td>
<td>Remains a strong part of the MSE program</td>
<td>Continue to emphasize Project Management and related skills</td>
</tr>
<tr>
<td>4. Effective Use of Computer Technology</td>
<td>Engineering Chair and Faculty</td>
<td>Direct and indirect student feedback; employer feedback</td>
<td>Current Standard Computer Tools for Engineering</td>
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<td>Continue with computer apps course development and add additional computer components to other courses</td>
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<td>6. Aware of professional, ethical, and legal responsibilities</td>
<td>Engineering Chair and Faculty</td>
<td>Employer feedback through focus groups; informal feedback from PE Board and other groups; faculty observation</td>
<td>Standard professional practice and applicable laws, regulations, and codes of PR</td>
<td>Students need additional focus on these aspects of engineering practice</td>
<td>Increased emphasis on courses such as Engineering Law; additions to course content</td>
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</table>
Submitted by:

Betsy Dulin, Dean, CITE
William Pierson, Chair, Engineering Division
College of Information Technology and Engineering
PROGRAM ASSESSMENT REPORT

2003-2004 Academic Year

Master of Science in Engineering

Marshall University
College of Information Technology and Engineering

Division of Engineering
V. Assessment Activities

C. Program Goals

The College of Information Technology and Engineering (CITE) has developed the following program objectives for the Master of Science in Engineering (MSE) degree:

- Provide a graduate engineering program with a strong, focused central core, with opportunities for concentrated study in engineering disciplines important to the region and that currently include chemical engineering, environmental engineering, and engineering management.
- Provide a program that meets the evolving needs of engineers and their employers in the region by enhancing technical engineering competence, management and leadership skills, and sensitivity to legal and ethical issues.
- Continuously monitor, evaluate, and revise existing academic programs through interactions with students and employers.
- Employ technology and other mechanisms to increase learning opportunities and make the program available and accessible at all locations in the region where sufficient demand exists.
- Take a leadership role in fostering the technological and economic development of the region by providing technological resources and professional development opportunities to the community and by developing a reputation for high-quality outcomes.
- Provide support for faculty to enhance competence and currency.
- Expose students to the managerial, legal, political and ethical issues commonly associated with the practice of engineering.

These objectives were developed in 1999 and have not changed during the reporting period. Various members of the professional engineering community and the engineering faculty continue to review and validate the goals, as discussed below.

B. Learning Outcomes/Data Collection

1. Outcome: Students meet academic standards and achieve acceptable levels of technical competence.
During the reporting period, CITE’s Engineering Division included five full-time faculty members, with extensive expertise and experience in the MSE areas of emphasis, and contracted with several adjunct faculty. The program continued to utilize the talents and skills of several other Ph.D. engineers in other CITE divisions.

Informal and immediate feedback from working professional graduate students continues to play a major role in assessing the program’s technical strengths and weaknesses. Because the majority of our MSE students are employed full-time professionals and part-time evening students, a mixture of both formal and informal evaluation processes continue to provide the most useful information to the MSE coordinator, division chair, faculty, and administrators. These include focus group meetings, course evaluations, informal course-evaluation questions during comprehensive project defenses, and direct daily communication with students.

As a result of the feedback obtained, program faculty have made adjustments to course coverage in certain cases, and are continuing to embark on a general review of the program with an ultimate goal of eliminating and/or adding areas of emphasis that accurately reflect the current and changing engineering population in the Advantage Valley, which fluctuates with changes in the regional economy. For instance, the chemical engineering emphasis is being phased out, due to fact that the number of chemical engineers in the region is decreasing and there are few chemical students left in the program. On the other hand, the number of civil and transportation engineers remains much more stable or is increasing.

Faculty members also remained diligent regarding students’ comprehensive project defenses made during the last reporting period. Feedback from students and employers has been positive, and the comprehensive projects continued to be a strong evaluation tool.

2. Outcome: Graduates are valued by employers.

Past focus group meetings have shown that employers valued the practical, applied approach of the MSE program, and continue to voice a need for additional education in communication and business. As a result of these comments and informal feedback, CITE continued to offer courses that have their origins in business, but with engineering applications, such as a management of technical human resources and organizations course for the engineering management program that focuses on the management of technical professionals. Students have also been encouraged to consider courses in finance and management in CITE’s Technology Management graduate program as electives.

3. Outcome: Graduates can apply management and socio-economic concepts to the solution of complex engineering problems.

Faculty continued to work toward this outcome through incorporation of new materials into
existing technical courses, and through the addition of and/or increased attention to supporting courses such as Project Management, Engineering Law, Human Resources, Operations Management, and an Engineering Management Seminar. The success of this approach is being assessed primarily through faculty observation of student outcomes based on written assignments and class discussions. In addition, feedback from students on faculty evaluations and additional survey questions indicates that they see this area as one of the program’s primary strengths.

4. Outcome: Graduates can effectively use computer technology to solve engineering problems.

Based on focus group and advisory board input, as well as suggestions from students, faculty continue to update software applications within MSE courses that make use of modeling, scheduling, numerical and statistical analysis, and related subjects.

5. Outcome: Graduates can function comfortably in leadership roles and can communicate effectively in written, oral, and team contexts.

These skills are assessed through employer feedback and through a variety of presentations and group projects in courses such as Project Management and required technical courses. No changes were made during the reporting period based on this information.

6. Outcome: Graduates are aware of professional, ethical, and legal responsibilities.

This outcome is assessed based on student performance in courses such as Engineering Law, Management of Technical Human Resources and Organizations, and from their own comments regarding program effectiveness. No changes were made in this area during the reporting period.

C. Results

The results from informal and formal assessment are as follows:

- Course content changes were made each semester in accordance with changing student demographic and course evaluations.
- A curriculum review process continued to assess the effectiveness and currency of current areas of emphasis.
- A CITE ad hoc assessment committee, chaired by program faculty from the MSE program, continued to develop a more structured assessment model for all engineering and computer science, and related programs in the college. The group has not completed its work, but will develop a model consistent with university goals and with specialized program assessment requirements mandated by the Accreditation Board for Engineering and Technology.
VI. Plans for the Current Year

CITE will continue to work on a college-wide assessment model, and plans to continue to evaluate the need for the addition or deletion of areas of emphasis to the MSE degree program. This work will continue to be impacted by the undergraduate computer science and engineering programs.

It is expected that many more individuals from the regional engineering community will become involved in program and curriculum planning.

We will continue to make short-term modifications based on weekly informal assessment processes and written student comments on semester course evaluations. Working graduate students tend to go beyond assessing the performance of particular faculty members and make a variety of insightful and detailed comments regarding course effectiveness and content during the evaluation process.

III. Assistance Needed

As always, faculty require more funding and released time in order to pay meaningful attention to the development of a new assessment plan for CITE. Faculty also continue to need support for travel to conferences and development activities in order to stay current in their graduate education abilities and better to contribute to student education.

IV. Most Important Lesson Learned

As we have reported in the past, many traditional methods of assessing the effectiveness of engineering degree programs do not work in the context of our adult students who are, for the most part, employed full-time and pursuing graduate education on a part-time basis. For a variety of reasons, graduates of the MSE program, most of whom attending part-time while working, do not remain “attached” to the institution or faculty, and are less likely to complete survey instruments, etc.

Our most important means of assessing program effectiveness is through daily interactions with our students, in the form of class requirements or informal feedback that our students, more than most, are very proactive and aggressive about providing.
## Assessment of Student Outcomes: 2003-2004

**Program: MS Engineering**

<table>
<thead>
<tr>
<th>Component / Course / Program Level</th>
<th>Student Outcome</th>
<th>Person or Office Responsible</th>
<th>Assessment Tool or Approach</th>
<th>Standards/Benchmark</th>
<th>Results/Analysis</th>
<th>Action Taken</th>
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<tbody>
<tr>
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<td>1. Academic standards and competence</td>
<td>Engineering Chair and Faculty Advisors</td>
<td>Comprehensive Project; exams and other class assignments</td>
<td>Faculty experience and accepted industry standards</td>
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<td></td>
<td>2. Students are valued by employers</td>
<td>Engineering Faculty</td>
<td>Focus groups and other similar forums; informal professional interactions</td>
<td>Standard industry practices and requirements</td>
<td>Continued approval of MSE program; need for more attention to certain skills</td>
<td>Constant updates to course material and curriculum</td>
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<td></td>
<td>3. Apply management and socio-economic concepts to engineering problems</td>
<td>Engineering Chair and Faculty</td>
<td>Course-specific exams and other evaluation procedures; comprehensive project</td>
<td>Course standards and required learning outcomes; industry standards</td>
<td>Remains a strong part of the MSE program</td>
<td>Continue to emphasize Project Management and related skills</td>
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<tr>
<td>4. Effective Use of Computer Technology</td>
<td>Engineering Chair and Faculty</td>
<td>Direct and indirect student feedback; employer feedback</td>
<td>Current Standard Computer Tools for Engineering</td>
<td>Computer applications course continued to aid the curriculum; changes/updates to software in other courses</td>
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Submitted by:

Betsy Dulin, Dean, CITE
William Pierson, Chair, Engineering and Computer Science Division
Eldon Larsen, Coordinator, MSE Degree Program
College of Information Technology and Engineering
PROGRAM ASSESSMENT REPORT

2004-2005 Academic Year

Master of Science in Engineering

Marshall University
College of Information Technology and Engineering

Division of Engineering
Marshall University
College of Information Technology and Engineering

2005 PROGRAM ASSESSMENT REPORT

MASTER OF SCIENCE IN ENGINEERING

VII. Assessment Activities

D. Program Goals

The College of Information Technology and Engineering (CITE) has developed the following program objectives for the Master of Science in Engineering (MSE) degree:

- Provide a graduate engineering program with a strong, focused central core, with opportunities for concentrated study in engineering disciplines important to the region and that currently include chemical engineering, environmental engineering, and engineering management.
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These objectives were developed in 1999 and have not changed during the reporting period. Various members of the professional engineering community and the engineering faculty continue to review and validate the goals, as discussed below.

B. Learning Outcomes/Data Collection

1. Outcome: Students meet academic standards and achieve acceptable levels of technical competence.
During the reporting period, CITE’s Engineering Division lost one full-time faculty member to retirement but is in the process of replacing that individual with someone who can provide support for one of the MSE’s area of emphasis, especially in the area of transportation engineering. A new adjunct has been identified who is providing support in the area of engineering statistics. In addition to the five full-time faculty members and adjuncts in the Engineering Division, the program continued to utilize the talents and skills of several other Ph.D. engineers in other CITE divisions, including a newly hired Computer Science faculty member with an engineering background and a newly hired member of the Technology Management program.

Informal and immediate feedback from working professional graduate students continues to play a major role in assessing the program’s technical strengths and weaknesses. Because the majority of our MSE students are employed full-time professionals and part-time evening students, a mixture of both formal and informal evaluation processes continue to provide the most useful information to the MSE coordinator, division chair, faculty, and administrators. These include focus group meetings, course evaluations, informal course-evaluation questions during comprehensive project defenses, and direct daily communication with students.

As a result of the feedback obtained, program faculty have made adjustments to course coverage in certain cases, and are continuing to embark on a general review of the program with an ultimate goal of eliminating and/or adding areas of emphasis that accurately reflect the current and changing engineering population in the Advantage Valley, which fluctuates with changes in the regional economy. For instance, the chemical engineering emphasis is being phased out, due to fact that the number of chemical engineers in the region is decreasing and there are few chemical students left in the program. On the other hand, the number of civil and transportation engineers remains much more stable or is increasing.

Faculty members also remained diligent regarding students’ comprehensive project defenses made during the last reporting period. Feedback from students and employers has been positive, and the comprehensive projects continued to be a strong evaluation tool.

2. **Outcome:**

   Graduates are valued by employers.

Past focus group meetings have shown that employers valued the practical, applied approach of the MSE program, and continue to voice a need for additional education in communication and business. As a result of these comments and informal feedback, CITE continued to offer courses that have their origins in business, but with engineering applications, such as a management of technical human resources and organizations course for the engineering management program that focuses on the management of technical professionals. Students have also been encouraged to consider courses in finance and management in CITE’s Technology Management graduate program as electives.
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Faculty continued to work toward this outcome through incorporation of new materials into existing technical courses, and through the addition of and/or increased attention to supporting courses such as Project Management, Engineering Law, Human Resources, Operations Management, and an Engineering Management Seminar. The success of this approach is being assessed primarily through faculty observation of student outcomes based on written assignments and class discussions. In addition, feedback from students on faculty evaluations and additional survey questions indicates that they see this area as one of the program’s primary strengths.

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C. Results

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As we have reported in the past, many traditional methods of assessing the effectiveness of engineering degree programs do not work in the context of our adult students who are, for the most part, employed full-time and pursuing graduate education on a part-time basis. For a variety of reasons, graduates of the MSE program, most of whom attending part-time while working, do not remain “attached” to the institution or faculty, and are less likely to complete survey instruments, etc.

Our most important means of assessing program effectiveness is through daily interactions with our students, in the form of class requirements or informal feedback that our students, more than most, are very proactive and aggressive about providing.
## Assessment of Student Outcomes: 2004-2005

Program: **MS Engineering**

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Submitted by:

Betsy Dulin, Dean, CITE
William Pierson, Chair, Engineering and Computer Science Division
Eldon Larsen, Coordinator, MSE Degree Program
College of Information Technology and Engineering
APPENDIX VIII

PAST ANNUAL PROGRAM ASSESSMENT REPORTS--Reviews
MEMORANDUM

TO: Dr. Betsy Dulin, Engineering
FROM: Bob Edmunds, Coordinator for Program Review and Assessment
DATE: July 29, 2002


1. This memorandum is the review of the information provided in the 5-year Program Review for the MS Engineering. These reports have been reviewed by members of the University Assessment Committee. I am enclosing a copy of the reviewer’s comments. I will also provide comments from my review of the assessment report submitted by your program.

2. As we come upon our 10 year self study by the North Central Association’s Higher Learning Commission, I am enclosing several other documents for your information. Document 1 is the Departmental Assessment Program Primary Traits Analysis form. This form mirrors the Student Academic Achievement Levels of Implementation provided by NCA. You will notice that there are three areas of importance to be considered: (1) Learning Objectives; (2) Assessment Measures; and (3) Feedback loop. The current report has been evaluated based on these levels. At this point in time, programs should be at Level 2 or better in each of the categories. If your program does not receive marks in Level 2, your program may wish to work on those areas during the coming year. This is important as Marshall will be judged on the NCA committee’s perception of our assessment program in terms of these various levels.

From a cursory analysis of your 5-year program review it appears that the program is at Level 2 in its description of Learning Objectives. In section 2: Assessment Measures the program rates a level 1. Measures were identified, but little else. In section 3: Feedback Loop the program rates a level 1. Some data is being collected, but no specific actions were identified. No specific performance standards have been identified as well.

3. Document 2 is a chart entitled “Marshall University: Assessment of Student Outcomes.” Each program must begin completing this chart for your records as well as our records. One of the criteria NCA will be using in our accreditation will be patterns of evidence. Patterns of evidence is the documentation that we are using the data we collect in our assessment efforts as a basis for making changes in our programs. This is only one part of the puzzle, but a very necessary piece of information. All to often, changes in curriculum are made based on limited
evidence. NCA wants each program to be able to document change based on evidence collected. This chart must be filled out and returned with the AY 2002 Assessment Review. Please remember that you do not have to assess every outcome every year; however, within a 3-4 year period of time all of the objectives must be evaluated, results listed and documentation of actions taken. This form will be e-mailed to you for your convenience in both Word and WordPerfect formats depending on which word processing program you use. All you will need to do is to enter the information in the appropriate places on the form and submit it along with your narrative summary of your assessment activities. You should continue to update this form as the years go by. This information will prove invaluable as you begin to prepare your 5 year program review documents. Some programs completed this form and returned it with the AY 2001 report. Thanks to you!!

4. The program has identified 6 specific learning outcomes for the program and listed general measures to assess them; however, the program has not presented any data for analysis or interpretation. These data must be summarized and specific actions need to be noted as a result of this analysis of data. Please use the chart “Assessment of Student Outcomes” when working with your six objectives. List them and give specific measures/standards and present the results with an indication of action taken, if necessary.

5. If you have any further questions of me, please do not hesitate to contact me.

Enclosures
1. Learning Objectives

Level 0
- No objectives were provided.

Level 1
- Learning objectives were identified.

Level 2
- Learning objectives were identified.
- They describe student behaviors.
- They are program, not class or course objectives.
- They are clear.

Level 3
- Comprehensive learning objectives are identified.
- Objectives are appropriate in number.
- They describe student behaviors.
- They are program, not class or course objectives.
- They are clear.
- They are measurable.
- They support Marshall's educational goals.
- They span multiple learning domains.

2. Assessment Measures

Level 0
- No measures were identified.

Level 1
- Measures were identified.

Level 2
- Measures were identified.
- They relate to the learning objectives.
- They include direct measures of student learning.

Level 3
- Measures were identified.
- They relate to the learning objectives.
- They emphasize direct measures of student learning.

They are multiple.
- They emphasize direct learning.
- They focus on real-world tasks.
- They stress higher order learning.
- They are integrated in the curriculum.
- They allow performance to be gauged over time.

3. Feedback Loop

Level 0
- The feedback loop was not described.

Level 1
- Some data are being collected but not interpreted or not used.

Level 2
- No performance expectations/standards have been established.
- Assessment is largely the responsibility of the department chair.

Level 3
- Data are being collected, interpreted, and used by faculty to improve student learning.
- Performance expectations/standards have been established.
- Data are being shared with other appropriate constituents.
- Data are considered in departmental planning and budgeting processes.

Level 3
- Data are routinely collected, interpreted, and used by faculty to improve student learning.
- Clear performance expectations/standards have been established for all measures.
- Data are being shared with other appropriate constituents.
- Data are an integral part of departmental planning and budgeting process.
- The improvement of student learning is central to the department.
- Assessment is a part of the culture of the department.
# Assessment Committee Analysis of Yearly Departmental/Program Assessment Reports

## Report for the Academic Year 2000-2001

**Program:** MS ENGINEERING

Please note: Some programs (those with current program reviews) will not address the questions in the same order.

<table>
<thead>
<tr>
<th>Assessment Report Guidelines</th>
<th>Evaluator’s Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Assessment Information (Student and Programmatic)</td>
<td>Good</td>
</tr>
<tr>
<td>a. Summarize the principal elements of the departmental assessment plan. The plan must include elements to assess student learning and programmatic outcomes</td>
<td></td>
</tr>
<tr>
<td>b. Provide information on the following elements:</td>
<td>Goals listed</td>
</tr>
<tr>
<td>(1) Educational goals of the program</td>
<td></td>
</tr>
<tr>
<td>(2) Measures of evaluating success in achieving goals</td>
<td>No specific evidence has been cited — very general statements</td>
</tr>
<tr>
<td>(3) Identification of the goals which are being successfully met and those which need attention as determined by an analysis of the data.</td>
<td>No specific evidence cited — general comments made</td>
</tr>
<tr>
<td>c. Indicate how the mastery of essential skills is integrated into the departmental assessment plan and how student achievement is being measured</td>
<td>Evidence?</td>
</tr>
<tr>
<td>d. Provide information on how assessment data is being used to improve program quality. Include specific examples.</td>
<td>Very general comments — specifics needed</td>
</tr>
<tr>
<td>e. As appropriate, provide information on a quantitatively based means of assessing the knowledge and skills of graduates against a national benchmark or a benchmark established by the institution.</td>
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</tbody>
</table>

Comments: (use the back of this sheet if necessary)
The program is also supported in part through contributions for replacement faculty from funded grants and other research projects, as well as several special revenue accounts generated from previous contract and continuing education courses offered by the former West Virginia Graduate College.

If this program were terminated as a major, approximately two to three faculty salaries would be the resulting savings. However, due to the fact that all engineering faculty teach required courses in other CITE degree programs, additional faculty may be hired as replacements. In addition, enrollment in other CITE courses would be negatively impacted due to the sharing of some courses among majors. Termination of the M.S.E. program would eliminate approximately three to four engineering courses per year taught by adjunct faculty.

(b) Facilities

CITE provides its students a variety of modern, technologically advanced facilities designed to support and enhance their studies. New and well-equipped classroom facilities designed especially for adult learners are available in the Robert C. Byrd Academic and Technical Center on the South Charleston campus. All M.S.E. courses are regularly offered from this location. In addition, classes are offered on the Huntington campus, and at other locations according to demand. If additional classroom space is needed in the Charleston area, classrooms at local high schools are utilized.

The M.S.E. degree program regularly makes use of multiple distance learning classrooms, which link the Huntington and South Charleston campuses with innovative and up-to-date class delivery capabilities. State-of-the-art computer facilities and labs are available to students on both campuses. Equipment and software are well-maintained and up-to-date in order to provide full support to M.S.E. students and faculty.

MSE courses have been offered at off-campus facilities including classrooms belonging to the International Union of Industrial Engineers, which is located on the National Mine Health and Safety Academy property in Beckley, and several locations in Parkersburg, including the WVU-Parkersburg campus and the offices of Pickering Associates (a local engineering firm). Courses are also offered in Teays Valley, usually at Hurricane High School.

With respect to research and other study needs, M.S.E. students have access to both the John Deaver Drinko library and the South Charleston campus library. CITE has made a concerted effort, during the current review period, to enhance and update engineering library holdings with respect to books, journals, and on-line materials.

6. Assessment Information

(a) Summarize the principal elements of the departmental assessment plan:

The assessment plan for the M.S.E. degree program, which has been updated on a yearly basis, ensures that the M.S.E. degree continues to meet the life-long learning and career enhancement needs of the regional engineering community.
The plan focuses on three elements: ongoing curriculum development, faculty development, and student academic achievement. As a result of focus group meetings with engineering employers, faculty, students, graduates, and advisory board members, as well as other feedback, six learning outcomes were developed and are used as the standard for measuring program effectiveness:

- Students meet academic standards and achieve an acceptable level of technical competence.
- Graduates are valued by employers.
- Graduates can apply management and socio-economic concepts to the solution of complex engineering problems.
- Graduates can effectively use computer technology to solve engineering problems.
- Graduates can function comfortably in leadership roles and can communicate effectively in written, oral and team contexts.
- Graduates are aware of professional, ethical, and legal responsibilities.

Attainment of these outcomes is measured through a combination of student information, including test scores, professional registration, and academic progress; faculty/course evaluations; surveys; periodic employer focus group and other direct feedback mechanisms; and regular review of faculty work plans with respect to professional community involvement.

(b) Provide information on the following elements:

Educational goals of the program – As reflected in the M.S.E. mission statement, the primary goal of the M.S.E. program is to provide multi-disciplinary, graduate level engineering education appropriate for working professionals and others who do not have the option of full-time programs in a traditional university setting, by providing quality academic instruction and service, life-long learning and career enhancement opportunities to engineers in the region. These goals serve as the basis for the six learning outcomes, identified above.

Measures of evaluating success in achieving goals – It is critical to the continued success of the M.S.E. degree program that program administrators and faculty continually “take the pulse” of the regional engineering community regarding program effectiveness and demonstrate an ability to react quickly and effectively to both market and technological changes. In the past, the most effective measure of this has been informal, but direct feedback, including periodic employer interviews, focus groups, and input from adjunct faculty. In addition, trends in tuition reimbursement provide some insight into industry perceptions of program effectiveness. More traditional instruments, such as surveys, test scores, and student evaluations also are used.

Success in meeting goals – According to the regional engineering community feedback, CITE continues to provide a quality, cost-effective graduate engineering program that is applicable to a wide range of engineering disciplines. Engineering instructors consistently receive favorable evaluations, and most courses are well populated and usually reimbursed by employers. Following a focus group meeting of employers in Fall, 1999, CITE revised the engineering curriculum to reflect current employer/student needs,
which resulted in several new and updated core courses in statistics and computer applications, as well as some changes in course requirements for areas of emphasis. CITE continues to refine its approach to technical writing/communication issues that are often raised by employers, and continues to work on the appropriate mechanisms to teach these skills to working professionals.

(c) **How mastery of essential skills is integrated into the departmental assessment plan and how student achievement is being measured:**

As mentioned above, the department assessment plan is based on six learning outcomes identified with the assistance of engineering faculty, employers, graduates, and students. These six outcomes reflect skills essential to graduates of the M.S.E. degree program.

Student achievement of these skills is measured through traditional means, such as test scores and academic progress. In addition, the comprehensive project serves as a mechanism for evaluating a student’s grasp of essential principles and also how the student integrates and applies learned skills in the context of a practical engineering problem. Finally, faculty involvement with the local professional community virtually ensures continued interaction with program graduates, as well as the opportunity to observe their performance in a professional setting.

(d) **How assessment data is used to improve program quality:**

Where possible, assessment information is used to make immediate adjustments to program content or structure. For example, the maturity level of M.S.E. program students usually results in thoughtful commentary on student evaluations regarding course content and its applicability to “real-world” situations. Engineering faculty react to this type of information on a semester-to-semester basis. In addition, informal feedback from students and/or employers has often resulted in immediate changes in course offerings, including regular and special topics courses.

With respect to long-term use of assessment data, surveys and employer focus group information are regularly used to evaluate the M.S.E. curriculum. This is normally done on an annual or bi-annual basis. During a very recent engineering education forum, a need was expressed for regional engineering programs in information technology and/or telecommunications. CITE plans to further investigate this need and will consider adding courses or an area of emphasis to accommodate it, if viable.

The M.S.E. degree program, which serves primarily working professionals, owes its continued viability to ongoing program assessment, both anecdotal and formal. Working students and their employers are not likely to support a program that does not continually evolve to meet changing market demands.

(e) **Quantitatively based means of assessing the knowledge and skills of graduates against a national or institutional benchmark:**

Because the vast majority, with very few exceptions, of M.S.E. students are fully employed, working professionals with diverse job responsibilities and careers, it has been difficult to assess the graduates against a national benchmark. Many, more traditional,
programs use professional engineering certification or successful completion of the Fundamentals of Engineering examination as a standard of measurement. However, many M.S.E. students enter this program after achievement of these goals.

The employment rate and salary level of program graduates has always been consistent with national trends.

7. Previous Reviews

The previous program review report was submitted in December, 1998. Reviewers recommended continuation of the program at all levels, without comment.

8. Advisory Committees

An advisory committee consisting of regional business leaders and industry professional assists CITE with various program planning and curriculum issues, as the need arises. In addition, program adjuncts often act as an informal advisory group, providing specific suggestions on course content and related matters.

9. Strengths/Weaknesses

The principal strengths of the M.S.E. degree program include its versatile, experienced, multi-disciplinary full-time faculty; its group of qualified, expert, adjunct faculty; its mature, committed, and professional students; and a mission that enables CITE and its Engineering Division to serve the region's engineering community in a meaningful and necessary way.

The faculty – both full-time and adjunct – collectively have many years of relevant work experience and are oriented toward application. They willingly travel throughout the region to deliver the program, and teach at times convenient to the students. They mentor the part-time faculty. Students feel that the faculty teach useful engineering courses in an effective manner.

M.S.E. students are a major strength of the program. Almost all the students are working in related fields, and many are using advanced technology and systems required to maintain the viability of their various enterprises. This greatly enriches the learning environment in the classroom – students share their experiences, insight and knowledge with class mates and also put substantial pressure on faculty to remain current and to be relevant in the classroom.

Another strength of CITE's M.S.E. program is location. The Advantage Valley corridor, which includes Charleston and Huntington, includes a concentrated community of engineering professionals employed by the chemical/manufacturing industry, consulting firms, and government agencies such as the Department of Transportation and WV Department of Environmental Protection. Most of these employers encourage lifelong learning and career enhancement of their employees by providing tuition reimbursement and other support.
MEMORANDUM

TO: Dr. Bill Pierson, Program Director, Engineering
FROM: Bob Edmunds, Coordinator for Program Review and Assessment
DATE: August 11, 2003

SUBJECT: Review of Yearly Assessment Report
PROGRAM: MSE Engineering

1. Thanks for submitting the yearly assessment report for MSE Engineering. Your report has been reviewed by members of the University Assessment Committee. What follows is a brief summary of the reviewers’ comments as well as some suggestions for the program to consider as it begins its assessment work for 2003-2004.

2. Guidelines for Yearly Assessment Reports:
   1. Program Goals: Program goals well stated.
   2. Learning Outcomes and Data Collection: Outcomes stated. Some appear, at first glance, to be difficult to measure. The collection of data does not seem to result from measuring student output.
   3. Results: The results seem to be derived from anecdotal data and analysis of more subjective data than objective data.
   4. Assessment Chart: The assessment chart is present. Columns 3, 4, and 5 are decidedly vague. No specific standards mentioned and no specific analysis of the results with vague comments in the action taken column.
   5. BOT Initiative #3: Not applicable to grad programs.
   6. Plans for the current year: Assessing needs for new areas of emphasis. Please report on the activities in your next report.
   7. Assistance needed: Assessment techniques. Please contact this office for assistance. UAC will be happy to supply workshops in developing assessment techniques.
3. The feedback loop from data collection, analysis and interpretation to the addressed faculty will be important in future reports. Specific changes in the courses, program, requirements, etc., should be well documented. Programmatic changes should be based upon careful examination of the data presented.

4. Primary Traits Analysis: As a part of our ongoing accreditation process with NCA/Higher Learning Commission, UAC has completed a chart identified as Efficacy of Assessment at the Program Level. This is based on the student academic achievement assessment levels of implementation. Here is the committee's perception of the program's Efficacy of Assessment:
   1. Learning Objectives: Level 2
   2. Assessment Measures: Level 2
   3. Feedback Loop: Level 2

Overall Score: 5.7
Range:
Level One: Beginning Implementation of Assessment Programs 1-3
Level Two: Making Progress in Implementing Assessment Programs 4-6
Level Three: Maturing Stages of Continuous Improvement 7-9

The reviewers have indicated that the program is functioning at the Level Two in its Efficacy of Assessment at the program level. The plan is good. The program needs to revisit the student outcomes again to determine specific measures of student academic achievement as well as the more subjective value of performance. Specific direct measures need to be instituted in the program. Another area is the collection of specific data to be used as part of the assessment process. Finally, the program needs to enhance its feedback loop. It appears that the program is using indirect measures for decision making. This process is good, but generally doesn't tell the entire picture.

5. The program needs to revisit its learning outcomes and develop a few which are basic student competencies which should grow out of a program in Engineering. Outcome #1 needs to be expanded into several specific student academic achievement outcomes—what specific competencies should graduates have? The other outcomes are measurable and specific instruments need to be developed to adequately measure them.

6. If the program needs further assistance, contact this office. As the program begins to explore new areas, assessment information will become more useful. Additionally, when the program seeks accreditation, a well grounded assessment program will be invaluable.

7. Thank you for your report. If you have any questions please do not hesitate to contact this office.
<table>
<thead>
<tr>
<th>Assessment Report Guidelines</th>
<th>Evaluator’s Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.a. Program Goals</td>
<td>Well Stated</td>
</tr>
<tr>
<td>b. Learning outcomes data collection</td>
<td>Stated - Some appear difficult to measure</td>
</tr>
<tr>
<td>c. Results</td>
<td>Very little hard data</td>
</tr>
<tr>
<td>(Is there a chart which identifies the program objectives/ the appropriate assessment tools/ standards/results/ actions taken.)</td>
<td>Yes ☑ No ❌ Benchmarks/ Standards, results &amp; action taken are vague</td>
</tr>
<tr>
<td>II. BOT Initiative #3 (Undergraduate Programs Only.)</td>
<td>N/A</td>
</tr>
<tr>
<td>III. Plans for current Year</td>
<td>Well Stated</td>
</tr>
<tr>
<td>IV. Assistance needed</td>
<td>Well Stated</td>
</tr>
<tr>
<td>V. Most important thing learned through this process</td>
<td>Well Stated</td>
</tr>
</tbody>
</table>
1. **Learning Objectives**

   **Level 0**
   - No objectives were provided.

   **Level 1**
   - Learning objectives were identified.

   **Level 2**
   - Learning objectives were identified.
   - They describe student behaviors.
   - They are program, not class or course, objectives.
   - They are clear.

   **Level 3**
   - Comprehensive learning objectives are identified.
   - Objectives are appropriate in number.
   - They describe student behaviors.
   - They are program, not class or course, objectives.
   - They are clear.
   - They are measurable.
   - They support Marshall’s educational goals.
   - They span multiple learning domains.

2. **Assessment Measures**

   **Level 0**
   - No measures were identified.

   **Level 1**
   - Measures were identified.

   **Level 2**
   - Measures were identified.
   - They relate to the learning objectives.
   - They include direct measures of student learning.

   **Level 3**
   - Measures were identified.
   - They relate to the learning objectives.
   - They emphasize direct measures of student learning.

   - They are multiple.
   - They emphasize direct learning.
   - They focus on real-world tasks.
   - They stress higher order learning.
   - They are integrated in the curriculum.
   - They allow performance to be gauged over time.

3. **Feedback Loop**

   **Level 0**
   - The feedback loop was not described.

   **Level 1**
   - Some data are being collected but not interpreted or not used.
   - No performance expectations/standards have been established.
   - Assessment is largely the responsibility of the department chair.

   **Level 2**
   - Data are being collected, interpreted, and used by faculty to improve student learning.
   - Clear performance expectations/standards have been established for all measures.
   - Data are being shared with other appropriate constituents.
   - Data are an integral part of departmental planning and budgeting processes.

   **Level 3**
   - Data are routinely collected, interpreted, and used by faculty to improve student learning.
   - Clear performance expectations/standards have been established for all measures.
   - Data are being shared with other appropriate constituents.
   - Data are an integral part of departmental planning and budgeting process.
   - The improvement of student learning is central to the department.
   - Assessment is a part of the culture of the department.
Assessment Committee Analysis of Yearly Departmental/Program Assessment Reports
Report for the Academic Year 2001-2002

Program: M.S. Engineering

<table>
<thead>
<tr>
<th>Assessment Report Guidelines</th>
<th>Evaluator’s Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.a. Program Goals</td>
<td>program goals/job clearly stated</td>
</tr>
<tr>
<td>b. Learning outcomes data collection</td>
<td>data collected more subjective than objective</td>
</tr>
<tr>
<td>c. Results</td>
<td></td>
</tr>
<tr>
<td>(Is there a chart which identifies the program objectives/the appropriate assessment tools/standards/results/actions taken.)</td>
<td>Yes [ ] No [ ]</td>
</tr>
</tbody>
</table>

II. BOT Initiative #3
(Undergraduate Programs Only.)
(This is for undergraduate programs only.)

III. Plans for current Year
consistent movement to improve plan

IV. Assistance needed

V. Most important thing learned through this process
traditional assessment tools impractical in scope of the program. Necessary for innovative assessment parameters.
Efficacy of Assessment at the Program Level

M.S. Engineering
Marshall University
PRIMARY TRAIT ANALYSIS
NCA Levels of Implementation 2002-2003
DATE: 4-4-03

1. Learning Objectives

Level 0
- No objectives were provided.

Level 1
✓ Learning objectives were identified.

Level 2
✓ Learning objectives were identified.
✓ They describe student behaviors.
✓ They are program, not class or course, objectives.
✓ They are clear.

Level 3
- Comprehensive learning objectives are identified.
- Objectives are appropriate in number.
- They describe student behaviors.
- They are program, not class or course, objectives.
- They are clear.
- They are measurable.
- They support Marshall's educational goals.
✓ They span multiple learning domains.

2. Assessment Measures

Level 0
- No measures were identified.

Level 1
- Measures were identified.

Level 2
✓ Measures were identified.
✓ They relate to the learning objectives.
✓ They include direct measures of student learning.

Level 3
- Measures were identified.
- They relate to the learning objectives.
- They emphasize direct measures of student learning.

They are multiple.
- They emphasize direct learning.
- They focus on real-world tasks.
- They stress higher order learning.
- They are integrated in the curriculum.
- They allow performance to be gauged over time.

3. Feedback Loop

Level 0
- The feedback loop was not described.

Level 1
- Some data are being collected but not interpreted or not used.
- No performance expectations/standards have been established.
- Assessment is largely the responsibility of the department chair.

Level 2
✓ Data are being collected, interpreted, and used by faculty to improve student learning.
✓ Performance expectations/standards have been established.
✓ Data are being shared by other appropriate constituents.
✓ Data are considered in departmental planning and budgeting processes.

Level 3
- Data are routinely collected, interpreted, and used by faculty to improve student learning.
- Clear performance expectations/standards have been established for all measures.
- Data are being shared with other appropriate constituents.
- Data are an integral part of departmental planning and budgeting process.
- The improvement of student learning is central to the department.
- Assessment is a part of the culture of the department.
Assessment Committee Analysis of Yearly Departmental/Program Assessment Reports
Report for the Academic Year 2001-2002

Program: MASTER OF SCIENCE IN ENGINEERING

<table>
<thead>
<tr>
<th>Assessment Report Guidelines</th>
<th>Evaluator's Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia. Program Goals</td>
<td>HOW ARE THEY MEASURING NEEDS OF ENGINEERS?</td>
</tr>
<tr>
<td>b. Learning outcomes data collection</td>
<td>ASSESSMENT TOOLS ARE EXAMS AND CLASS ASSIGNMENTS DESIGNED FROM INDUSTRY STANDARDS</td>
</tr>
<tr>
<td>c. Results</td>
<td>RESULTING CHANGES NICELY DEFINED</td>
</tr>
</tbody>
</table>

(Is there a chart which identifies the program objectives/the appropriate assessment tools/standards/results/actions taken.)

Yes  ✓  No__________

II. BOT Initiative #3
(Undergraduate Programs Only.)

(This is for undergraduate programs only.)

---

III. Plans for current Year

NO COMMENT

IV. Assistance needed

WELL DEFINED

V. Most important thing learned through this process

NO COMMENT
1. Learning Objectives

Level 0
- No objectives were provided.

Level 1
- Learning objectives were identified.

Level 2
- Learning objectives were identified.
- They describe student behaviors.
- They are program, not class or course, objectives.
- They are clear.

Level 3
- Comprehensive learning objectives are identified.
- Objectives are appropriate in number.
- They describe student behaviors.
- They are program, not class or course, objectives.
- They are clear.
- They are measurable.
- They support Marshall's educational goals.
- They span multiple learning domains.

2. Assessment Measures

Level 0
- No measures were identified.

Level 1
- Measures were identified.

Level 2
- Measures were identified.
- They relate to the learning objectives.
- They include direct measures of student learning.

Level 3
- Measures were identified.
- They relate to the learning objectives.
- They emphasize direct measures of student learning.

3. Feedback Loop

Level 0
- The feedback loop was not described.

Level 1
- Some data are being collected but not interpreted or not used.
- No performance expectations/standards have been established.
- Assessment is largely the responsibility of the department chair.

Level 2
- Data are being collected, interpreted, and used by faculty to improve student learning.
- Performance expectations/standards have been established.
- Data are being shared by other appropriate constituents.
- Data are considered in departmental planning and budgeting processes.

Level 3
- Data are routinely collected, interpreted, and used by faculty to improve student learning.
- Clear performance expectations/standards have been established for all measures.
- Data are being shared with other appropriate constituents.
- Data are an integral part of departmental planning and budgeting process.
- The improvement of student learning is central to the department.
- Assessment is a part of the culture of the department.
Office of Program Review & Assessment

To: Dr. Bill Pearson, Chair, Engineering
From: Bob Edmunds, Coordinator for Program Review and Assessment
Date: September 17, 2004

Subject: Yearly Assessment Report, MSE, Engineering

1. Thank you for submitting the Yearly Assessment Report for the program. Please use the information in this report to guide your assessment activities during AY 2004-2005.

2. What follows is a brief critique of the report you submitted for the academic year 2002-2003.

<table>
<thead>
<tr>
<th>I. a. Program goals:</th>
<th>Program goals were well stated.</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. Learning outcomes and data collection:</td>
<td>The learning outcomes were stated; however, no specific data was reported. Conclusions were drawn, based on faculty activities primarily. No student academic achievement data were presented.</td>
</tr>
<tr>
<td>c. Results:</td>
<td>No specific results were listed. Analysis based on generalizations.</td>
</tr>
<tr>
<td>II. BOT Initiative #3:</td>
<td>Not applicable to Graduate Programs.</td>
</tr>
<tr>
<td>III. Plans for current year:</td>
<td>Plans were outlined. Increased help from the Associate Dean of CITTE.</td>
</tr>
<tr>
<td>IV. Assistance needed:</td>
<td>Funding for assessment work.</td>
</tr>
<tr>
<td>V. Lessons learned:</td>
<td>Well stated.</td>
</tr>
</tbody>
</table>


This chart will help the program and the University Assessment Committee monitor a program's patterns of evidence. Please remember that you do not have to assess every outcome every year; however, within a 3-4 year period of time all program objectives must be evaluated, results analyzed, and actions taken (feedback loop) documented.

The chart was presented. The program objectives are a mix between direct and indirect outcomes. The program needs to identify specific assessment tools and produce results based on the results obtained from the use of that tool. The standards appear to be fairly general. What are accepted industry standards or course standards, please be specific? Some of the action taken does not appear to follow from the tools—standards—results/analysis sections. Specific tools, measurable standards, and data collection/reporting would make the report more effective.

4. Efficacy of Assessment:

As Marshal approaches its ten year self-study by the North Central Association’s Higher Learning Commission, programs will be measured in terms of their efficacy of assessment. Programs are evaluated in terms of the development of measurable learning outcomes; the use of viable assessment measures and the implementation of an effective feedback loop. The current report has been evaluated based on these categories. Scores can range from 0-3 in each category. Overall total scores ranging from 1-3 indicate that the program is in the Beginning Stages of developing a viable assessment program.

Overall scores ranging from 4-6 indicate that a program is making progress toward implementing a viable assessment program and overall scores ranging from 7-9 indicate that a program is in the maturing stages of continuous improvement. All programs should be in Level 2 (overall score 4-6) (Making progress toward implementing a viable assessment program) or Level 3 (overall score 7-9) (Maturing stages of continuous improvement) by May 2005.
Scores:

<table>
<thead>
<tr>
<th>I. Learning Outcomes</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>II. Assessment Measures</td>
<td>3</td>
</tr>
<tr>
<td>III. Feedback Loop</td>
<td>1</td>
</tr>
<tr>
<td>Overall Score</td>
<td>6</td>
</tr>
</tbody>
</table>

Interpretation: The program has achieved an overall score of 6 which places it at the top of Level 2 of NCA/HLC efficacy of program assessment. It appears that several of the outcomes are at best 'difficult' to measure. How does one quantify "effective use," for instance? What were the surveys used and what are the results? Data would then indicate the results/analysis and action taken. The Assessment measures are listed; however, there is no indication of which specific measures were used in order to generate the results and action taken. The standards are not specific enough. Choose a specific measure and set the appropriate standard of measurement. These yearly reports should be that, based on some specific data collected during that particular year. Please remember that not all objectives need be measured every year, but that a pattern be established to measure all objectives during the average time it takes a student to matriculate. The program should be developing patterns of evidence to indicate student academic achievement, employer feedback, industry standards, direction of the discipline, etc.

5. Recommendations:
The program should revise some of the student outcomes to ensure that they are more measurable with current tools. Results should be specific with appropriate action taken when necessary.

6. General Comments:
It is imperative that programs keep a record of their assessment activities and have this information available for the NCA/HLC site committee if requested.

7. Thanks so much for continuing to aid Marshall in its ongoing assessment efforts.

Enclosures
1. **Learning Objectives**

   Level 0
   - No objectives were provided.

   Level 1
   - Learning objectives were identified.

   Level 2
   - All in level 1 plus:
     - They describe student behaviors.
     - They are program, not class or course, objectives.
     - They are clear.

   Level 3
   - All in level 2 plus:
     - Comprehensive learning objectives are identified.
     - Objectives are appropriate in number.
     - They are measurable.
     - They support Marshall's educational goals.
     - They span multiple learning domains.

2. **Assessment Measures**

   Level 0
   - No measures were identified.

   Level 1
   - Measures were identified.

   Level 2
   - All in Level 1 plus:
     - They relate to the learning objectives.
     - They include direct measures of student learning.

   Level 3
   - All in Level 2 plus:
     - They emphasize direct measures of student learning.
     - They are multiple.
     - They emphasize direct learning.
     - They focus on real-world tasks.
     - They stress higher order learning.
     - They are integrated in the curriculum.
     - They allow performance to be gauged over time.

3. **Feedback Loop**

   Level 0
   - The feedback loop was not described.

   Level 1
   - Some data are being collected but not interpreted or not used.
   - No performance expectations/standards have been established.
   - Assessment is largely the responsibility of the department chair.

   Level 2
   - Data routinely are being collected, interpreted, and used by faculty to improve student learning.
   - Performance expectations/standards have been established.
   - Data are being shared by other appropriate constituents.
   - Data are considered in departmental planning and budgeting processes.

   Level 3
   - All in Level 2 plus:
     - Clear performance expectations/standards have been established for all measures.
     - Data are an integral part of departmental planning and budgeting processes.
     - The improvement of student learning is central to the department.
     - Assessment is a part of the culture of the department.
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<tr>
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<td>c. Results</td>
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</tr>
<tr>
<td>(Is there a chart which identifies the program objectives/ the appropriate assessment tools/ standards/results/actions taken.)</td>
<td>Yes_________ No_________</td>
</tr>
<tr>
<td>II. BOT Initiative #3 (Undergraduate Programs Only.)</td>
<td>(This is for undergraduate programs only.)</td>
</tr>
<tr>
<td>III. Plans for current Year</td>
<td></td>
</tr>
<tr>
<td>IV. Assistance needed</td>
<td></td>
</tr>
<tr>
<td>V. Most important thing learned through this process</td>
<td></td>
</tr>
</tbody>
</table>
Office of Program Review & Assessment

To: Dr. Bill Pierson, Division Chair, Engineering
From: Bob Edmunds, Coordinator for Program Review and Assessment
Date: July 27, 2005

Yearly Assessment Report for: MSE Engineering

Thank you for submitting the Yearly Assessment Report for the program. Please use the information in this report to guide your assessment activities during AY 2005-2006.

The Yearly Assessment Report for documenting AY 2004-2005 assessment activities is due by October 3, 2005. If the program is scheduled for a program review during the 2005-6 academic year, the Program Review will suffice as the documentation of assessment activities and no separate report will be due.

Reviewer summary of yearly assessment report:
What follows is a brief critique of the report you submitted for the academic year 2003-2004. In most cases the report has been reviewed by 3 members of the University Assessment Committee.

<table>
<thead>
<tr>
<th>Yearly Assessment Report Critique</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>i. a. Program goals:</strong></td>
</tr>
<tr>
<td>Well articulated program goals.</td>
</tr>
<tr>
<td><strong>b. Learning outcomes</strong></td>
</tr>
<tr>
<td>and data collection:</td>
</tr>
<tr>
<td>Outcomes are listed, however, few of the goals relate to student academic achievement. The goals primarily refer to graduates as opposed to competencies gained in the classroom. Both are probably necessary, though, however, a more balanced approach would be better.</td>
</tr>
<tr>
<td><strong>c. Results:</strong></td>
</tr>
<tr>
<td>The results are not listed. The discussion appears to be a plan, as opposed to actual data collection and the analysis of the results of that data collection.</td>
</tr>
<tr>
<td><strong>II. BOT Initiative #3:</strong></td>
</tr>
<tr>
<td>Not applicable to graduate programs.</td>
</tr>
<tr>
<td><strong>III. Plans for current year:</strong></td>
</tr>
<tr>
<td>Continued work on restructuring the program to fit the needs of the students.</td>
</tr>
<tr>
<td><strong>IV. Assistance needed:</strong></td>
</tr>
<tr>
<td>Faculty and reassigned time are essential.</td>
</tr>
<tr>
<td><strong>V. Lessons learned:</strong></td>
</tr>
<tr>
<td>Informal feedback appears to be important.</td>
</tr>
</tbody>
</table>

Review of the Assessment Summary Chart “Marshall University: Assessment of Student Outcomes."

This chart will help the program and the University Assessment Committee monitor a program’s patterns of evidence. Please remember that a program does not have to assess every outcome every year; however, within a 3-4 year period of time all program objectives must be evaluated, results analyzed, and actions taken (feedback loop) documented.

The Assessment Summary Chart is present. The chart should now include specific assessment tools, benchmarks & standards, specific data collection and analysis and specific instances of action taken. At present the summary chart is still in a ‘plan’ format as opposed to a working document that dives more detailed information. Exactly what are ‘accepted industry standards’? Did students reach those benchmarks and how was the resulting data analyzed? These are questions that should be answered in the chart. Also some specific actions taken would be indicative that data was collected, results analyzed and changes deemed necessary. At present, it is difficult to ascertain student academic achievement.

Efficacy of Assessment:
As Marshal approaches its ten year self-study by the North Central Association’s Higher Learning Commission, programs will be measured in terms of their efficacy of assessment. Programs are evaluated in terms of the development of measurable learning outcomes, the use of viable assessment measures, and the implementation of an effective feedback loop. The current report has been evaluated based on these categories. This year the report shows program scores from 2000-2001 to the present.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Scores:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Learning Outcomes</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>II. Assessment Measures</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>III. Feedback Loop</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total Overall Score:</td>
<td>4</td>
<td>5.7</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Level of Implementation (efficacy of assessment)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Score Ranges

<table>
<thead>
<tr>
<th>Score Ranges 0-3 in each of the three categories</th>
<th>A score of 0 indicates minimum activity in the category</th>
</tr>
</thead>
<tbody>
<tr>
<td>A score of 1 indicates that a program is in the beginning stages of assessment</td>
<td></td>
</tr>
<tr>
<td>A score of 2 indicates that a program is making progress toward implementing a viable assessment program</td>
<td></td>
</tr>
<tr>
<td>A score of 3 indicates that a program is in the maturing stages of its assessment program</td>
<td></td>
</tr>
</tbody>
</table>

Levels of Implementation Efficacy of Assessment

| A total overall score between 0 and 3 indicates | Level 1: the program is in the beginning stages of its assessment of student academic achievement |
| A total overall score between 4 and 6 indicates | Level 2: the program is making progress toward implementing a viable assessment program |
| A total overall score between 7 and 9 indicates | Level 3: the program is in the maturing stages of continuous improvement of student academic achievement |

The goal is to have the majority of our programs in level 3 by May 2006.

Interpretation:

The program learning outcomes and program goals are fairly well stated, except the outcomes relate more to graduates and outside input as to direct measures of student academic achievement. The measures are both direct and indirect, but no specific measures were listed. If the program is using course specific examinations, what are the standards, have benchmarks been established, and how well did students measure against those standards? Changes have been made to the program; however, little data appear to have been collected and analyzed in a formal matter which resulted in course or programmatic changes.

Recommendations:

The program should now embark on a process of collecting specific data from classroom performance as well as data from external sources. The program should show how changes were made by analyzing the results and how subsequent changes in the program produced graduates with the competencies demanded by the workplace.

General Comments:

It is imperative that programs maintain a record of their assessment activities and have this information available for the NCA/HLC site committee if requested.
Thanks so much for continuing to aid Marshall in its ongoing assessment efforts.

Enclosures
Assessment Committee Analysis of Yearly Departmental/Program Assessment Reports Report for the Academic Year 2003-2004

Program: MSE

<table>
<thead>
<tr>
<th>Assessment Report Guidelines</th>
<th>Evaluator's Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.a. Program Goals</td>
<td>Well articulated program goals are listed.</td>
</tr>
<tr>
<td>b. Learning outcomes data collection</td>
<td>Well articulated learning outcomes were listed. Assessment tools and data collection was described for each learning objective.</td>
</tr>
<tr>
<td>c. Results</td>
<td>Although there is a lot of reference to data being gathered none were presented. The reader can not determine whether the learning objectives were achieved.</td>
</tr>
<tr>
<td>(Is there a chart which identifies the program objectives/ the appropriate assessment tools/ standards/results/actions taken.)</td>
<td>Yes X No _________ \nThe relationships among the items in the table were poorly established. There was no coherency in the processes which should have been linked.</td>
</tr>
<tr>
<td>II. BOT Initiative #3 (Undergraduate Programs Only.)</td>
<td>(This is for undergraduate programs only.) There were no benchmarked data.</td>
</tr>
<tr>
<td>III. Plans for current Year</td>
<td>The plans for next year should be bolstered. It might help if the Director of Assessment were invited to discuss a tighter assessment plan and some new assessment tools.</td>
</tr>
<tr>
<td>IV. Assistance needed</td>
<td>Director of Assessment should be used as a resource.</td>
</tr>
<tr>
<td>V. Most important thing learned through this process</td>
<td>The department seems to be drawing conclusions from their informal verbal, anecdotal assessment process. But, more empirical hard data need to be collected, analyzed, and used as a basis for change and curriculum revision.</td>
</tr>
</tbody>
</table>
Efficacy of Assessment at the Program Level
Marshall University
PRIMARY TRAIT ANALYSIS
NCA Levels of Implementation 2003-2004
DATE: Spring 2005

1. Learning Objectives

Level 0
__ No objectives were provided.

Level 1
__ Learning objectives were identified.

Level 2
All in Level 1 plus:
__ They describe student behaviors.
__ They are program, not class or course, objectives.
__ They are clear.

Level 3
All in Level 1 and Level 2 plus:
__ They are comprehensive.
__ They are appropriate in number.
__ They describe student behaviors.
__ They are measurable.
__ They support Marshall's educational goals.
__ They span multiple learning domains.

2. Assessment Measures

Level 0
__ No measures were identified.

Level 1
__ Measures were identified.

Level 2
All in Level 1 plus:
__ They relate to the learning objectives.
__ They include direct measures of student learning.

Level 3
All in Level 1 and Level 2 plus:
__ They emphasize direct measures of student learning.
__ They are multiple.
__ They focus on real-world tasks.
__ They stress higher order learning.
__ They are integrated in the curriculum.
__ They allow performance to be gauged over time.

3. Feedback Loop

Level 0
__ The feedback loop was not described.

Level 1
__ Some data are being collected but not interpreted or not used.
__ No performance expectations/standards have been established.
__ Assessment is largely the responsibility of the department chair.

Level 2
__ Data are being collected, interpreted, and used by faculty to improve student learning.
__ Performance expectations/standards have been established.
__ Data are being shared by other appropriate constituents.
__ Data are considered in departmental planning and budgeting processes.

Level 3
__ Data are routinely collected, interpreted, and used by faculty to improve student learning.
__ Clear performance expectations/standards have been established for all measures.
__ Data are being shared with other appropriate constituents.
__ Data are an integral part of departmental planning and budgeting process.
__ The improvement of student learning is central to the department.
__ Assessment is a part of the culture of the department.
Assessment Committee Analysis of Yearly
Departmental/Program Assessment Reports
Report for the Academic Year 2003-2004

Program: MS Engineering

<table>
<thead>
<tr>
<th>Assessment Report Guidelines</th>
<th>Evaluator's Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia. Program Goals</td>
<td>Yes; strong goals</td>
</tr>
<tr>
<td>b. Learning outcomes</td>
<td>Yes, only one outcome deals w/ students. Other outcome data likely on tracking graduates</td>
</tr>
<tr>
<td>data collection</td>
<td></td>
</tr>
<tr>
<td>c. Results</td>
<td>Outcomes listed per performance tables, but no data are available</td>
</tr>
</tbody>
</table>

(Is there a chart which identifies the program objectives/the appropriate assessment tools/standards/results/actions taken.)

| II. BOT Initiative #3       | (This is for undergraduate programs only) |
| (Undergraduate Programs Only.) |                                           |

| III. Plan for current Year  | Yes - goals will include assessment of student performance |
| IV. Assistance needed      | Yes                                                      |
| V. Most important thing learned through this process | Yes |
Efficacy of Assessment at the Program Level
Marshall University

PRIMARY TRAIT ANALYSIS
NCA Levels of Implementation 2003-2004
DATE: ------------ Spring 2005

1. Learning Objectives

Level 0
- No objectives were provided.

Level 1
- Learning objectives were identified.

Level 2
- All in Level 1 plus:
  - They describe student behaviors.
  - They are program, not class or course, objectives.
  - They are clear.

Level 3
- All in Level 1 and Level 2 plus:
  - They are comprehensive.
  - They are appropriate in number.
  - They describe student behaviors.
  - They are measurable.
  - They support Marshall’s educational goals.
  - They span multiple learning domains.

2. Assessment Measures

Level 0
- No measures were identified.

Level 1
- Measures were identified.

Level 2
- All in Level 1 plus:
  - They relate to the learning objectives.
  - They include direct measures of student learning.

Level 3
- All in Level 1 and Level 2 plus:
  - They emphasize direct measures of student learning.
  - They are multiple.
  - They focus on real-world tasks.
  - They stress higher order learning.
  - They are integrated in the curriculum.
  - They allow performance to be gauged over time.

3. Feedback Loop

Level 0
- The feedback loop was not described.

Level 1
- Some data are being collected but not interpreted or not used.
- No performance expectations/standards have been established.
- Assessment is largely the responsibility of the department chair.

Level 2
- Data are being collected, interpreted, and used by faculty to improve student learning.
- Performance expectations/standards have been established.
- Data are being shared by other appropriate constituents.
- Data are considered in departmental planning and budgeting processes.

Level 3
- Data are routinely collected, interpreted, and used by faculty to improve student learning.
- Clear performance expectations/standards have been established for all measures.
- Data are being shared with other appropriate constituents.
- Data are an integral part of departmental planning and budgeting process.
- The improvement of student learning is central to the department.
- Assessment is a part of the culture of the department.
Efficacy of Assessment at the Program Level
Marshall University
PRIMARY TRAIT ANALYSIS
NCA Levels of Implementation 2003-2004
DATE: Spring 2005

1. Learning Objectives

Level 0
- No objectives were provided.

Level 1
☐ Learning objectives were identified.

Level 2
All in Level 1 plus:
- They describe student behaviors.
☐ They are program, not class or course, objectives.
- They are clear.

Level 3
All in Level 1 and Level 2 plus:
- They are comprehensive.
- They are appropriate in number.
- They describe student behaviors.
- They are measurable.
- They support Marshall’s educational goals.
- They span multiple learning domains.

2. Assessment Measures

Level 0
- No measures were identified.

Level 1
☐ Measures were identified.

Level 2
All in Level 1 plus:
- They relate to the learning objectives.
☐ They include direct measures of student learning.

Level 3
All in Level 1 and Level 2 plus:
- They emphasize direct measures of student learning.
- They are multiple.
- They focus on real-world tasks.
- They stress higher order learning.
- They are integrated in the curriculum.
- They allow performance to be gauged over time.

3. Feedback Loop

Level 0
- The feedback loop was not described.

Level 1
- Some data are being collected but not interpreted or not used.
☐ No performance expectations/standards have been established.
- Assessment is largely the responsibility of the department chair.

Level 2
- Data are being collected, interpreted, and used by faculty to improve student learning.
- Performance expectations/standards have been established.
- Data are being shared by other appropriate constituents.
- Data are considered in departmental planning and budgeting processes.

Level 3
- Data are routinely collected, interpreted, and used by faculty to improve student learning.
- Clear performance expectations/standards have been established for all measures.
- Data are being shared with other appropriate constituents.
- Data are an integral part of departmental planning and budgeting process.
- The improvement of student learning is central to the department.
- Assessment is a part of the culture of the department.
To: Dr. William Pierson, Chair Engineering  
From: Bob Edmunds, Coordinator for Program Review and Assessment  
Date: June 15, 2006

Yearly Assessment Report for: MSE Engineering

Thank you for submitting the Yearly Assessment Report for the program. Please use the information in this report to guide your assessment activities during AY 2006-2007.

The Yearly Assessment Report for documenting AY 2005-2006 assessment activities is due by October 3, 2006. If the program is scheduled for a program review during the 2006-7 academic year, the Program Review will suffice as the documentation of assessment activities and no separate report will be due.

Reviewer summary of yearly assessment report:

What follows is a brief critique of the report you submitted for the academic year 2004-2005. In most cases the report has been reviewed by members of the University Assessment Committee.

<table>
<thead>
<tr>
<th>I. a. Program goals:</th>
<th>Yearly Assessment Report Critique</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The program goals were listed.</td>
</tr>
<tr>
<td>b. Learning outcomes</td>
<td>The learning outcomes were listed, but in their present form, they are difficult to measure. No data were reported as being collected.</td>
</tr>
<tr>
<td>and data collection:</td>
<td></td>
</tr>
<tr>
<td>c. Results:</td>
<td>Observations and class changes have been made, but these changes do not flow out of reported analysis of data.</td>
</tr>
<tr>
<td>II. BOT Initiative #3:</td>
<td>Not applicable to graduate programs.</td>
</tr>
<tr>
<td>III. Plans for current year:</td>
<td>College wide assessment model. Use of off campus individuals to enhance the engineering offerings; Informal assessment work in faculty meetings</td>
</tr>
<tr>
<td>IV. Assistance needed:</td>
<td>Reassigned time for faculty. Work through the college to achieve this goal.</td>
</tr>
<tr>
<td>V. Lessons learned:</td>
<td>Most students in this program have full-time jobs and therefore are not attached to the program in significant ways.</td>
</tr>
</tbody>
</table>

Review of the Assessment Summary Chart “Marshall University: Assessment of Student Outcomes.”

This chart will help the program and the University Assessment Committee monitor a program’s patterns of evidence. Please remember that a program does not have to assess every outcome every year; however, within a 3-4 year period of time all program objectives must be evaluated, results analyzed, and actions taken (feedback loop) documented.

The assessment summary chart was present. The program outcomes/objectives were listed, but in their present state, are rather difficult to measure, and are very broad in their scope. The program would do well to develop a list of competencies for MSE graduates and then devise appropriate outcomes and measuring points for those competencies. No specific data were presented, only general conclusions were offered. The program would do well to develop specific competencies and then use current measuring instruments as tools to assess student competency.
Efficacy of Assessment:

Programs are evaluated in terms of the development of measurable learning outcomes, the use of viable assessment measures, and the implementation of an effective feedback loop. The current report has been evaluated based on these categories. This year the report shows program scores from 2000-2001 to the present.

<table>
<thead>
<tr>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Learning Outcomes</td>
</tr>
<tr>
<td>II. Assessment Measures</td>
</tr>
<tr>
<td>III. Feedback Loop</td>
</tr>
<tr>
<td>Total Overall Score:</td>
</tr>
<tr>
<td>Level of Implementation (efficacy of assessment)</td>
</tr>
</tbody>
</table>

Score Ranges

Score Ranges 0-3 in each of the three categories
- A score of 0 indicates minimum activity in the category
- A score of 1 indicates that a program is in the beginning stages of assessment
- A score of 2 indicates that a program is making progress toward implementing a viable assessment program
- A score of 3 indicates that a program is in the maturing stages of its assessment program

Levels of Implementation

Efficacy of Assessment

| A total overall score between 0 and 3 indicates | Level 1: the program is in the beginning stages of its assessment of student academic achievement |
| A total overall score between 4 and 6 indicates | Level 2: the program is making progress toward implementing a viable assessment program |
| A total overall score between 7 and 9 indicates | Level 3: the program is in the maturing stages of continuous improvement of student academic achievement |

Interpretation:

The Learning outcomes as stated are difficult to measure. They lack specificity. There are no actual measures listed. The program lists employer and graduate feedback, but does not list a specific instrument that may have been used. There are no specific results listed. If a survey was completed, how many surveys were sent, what was the response rate, and what did the survey indicate? The feedback loop appears to be working, but there are no specifics. What does ‘course changes’ really mean, what evidence was used to indicate that course changes were necessitated anyway? There is no evidence to support these changes.

Recommendations:

The report indicates competencies of graduates, but at this juncture, no specific competencies have been offered, and no evidence has been collected in support of any changes. Specific data need to be reported.

General Comments:
The program appears to be involved in the assessment process; however, much of the work should be coming from faculty and classroom assessments and normal program operations as opposed to having vast amounts in data imported from other sources. Certainly it would be advantageous for faculty to have funding to attend conferences, but with current funding levels this would be difficult to achieve. All we can do is ask.

Thanks so much for continuing to aid Marshall in its ongoing assessment efforts.

Enclosures
Two checks in any level indicate performance in that level, with the exception of level 0.

### Learning Objectives

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 0</td>
<td>No objectives were provided.</td>
</tr>
<tr>
<td>Level 1</td>
<td>Learning objectives were identified. They describe student behaviors.</td>
</tr>
<tr>
<td>Level 2</td>
<td>All in Level 1 plus: They are program, not class or course, objectives. They are clear. They are appropriate in number.</td>
</tr>
<tr>
<td>Level 3</td>
<td>All in Level 1 and Level 2 plus: They are comprehensive. They are measurable. They support Marshall’s educational goals. They span multiple learning domains.</td>
</tr>
</tbody>
</table>

### Assessment Measures

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 0</td>
<td>No measures were identified.</td>
</tr>
<tr>
<td>Level 1</td>
<td>Measures were identified. They relate to the learning objectives.</td>
</tr>
<tr>
<td>Level 2</td>
<td>All in Level 1 plus: They include direct and indirect measures of student learning. They are multiple. They are integrated in the curriculum.</td>
</tr>
<tr>
<td>Level 3</td>
<td>All in Level 1 and Level 2 plus: They emphasize direct measures of student learning. They focus on real-world tasks. They stress higher order learning. They allow performance to be gauged over time.</td>
</tr>
</tbody>
</table>

### Feedback Loop

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 0</td>
<td>The feedback loop was not described. Assessment is largely the responsibility of the department chair.</td>
</tr>
<tr>
<td>Level 1</td>
<td>Data are being collected but not interpreted or not used. Few or no performance expectations/standards have been established. There is minimal evidence that the assessment program is stable and will be sustainable.</td>
</tr>
<tr>
<td>Level 2</td>
<td>Data are being collected, but the program does not sufficiently show that it is using this information to improve the quality of student learning. Minimal performance expectations/standards have been established. Data are occasionally considered in departmental planning and budgeting processes. Assessment findings about the state of student learning are beginning to be incorporated into reviews of the academic program and into the program’s self-study.</td>
</tr>
<tr>
<td>Level 3</td>
<td>Data are routinely collected, interpreted, and used by faculty to improve the quality of student learning. Clear performance expectations/standards are in effect for all measures and are being used to assess the quality of student performance. Data are an integral part of departmental planning and budgeting processes. Data are routinely shared with other appropriate constituents in program reviews and the like. The improvement of student learning is central to the department. Assessment is a part of the culture of the department.</td>
</tr>
</tbody>
</table>