

Program Review

**Master of Science Degree in
Environmental Science**

**College of Information Technology and Engineering
Marshall University**

December 2005

Program Review

Marshall University

March 2005

Date: December 2005

Program: MS Environmental Science
Degree and Title

Date of Last Review: December 2000

Recommendation

Marshall University is obligated to recommend continuance or discontinuance of a program and to provide a brief rationale for the recommendation.

Recommendation

Code(#):

1. Continuation of the program at the current level of activity; or
2. Continuation of the program with corrective action (for example, reducing the range of optional tracks or merging programs); or
3. Identification of the program for further development (Please be specific; identify areas and provide a rationale in your request); or
4. Continuation of the program at the current level of activity, with the designation as a program of excellence (See Series 11 Statement from the Policy Commission); or
5. Discontinuation of the program (Procedures outlined in HEPC Administrative Bulletin 23).

Rationale for Recommendation: (Deans, please submit the rationale as a separate document. Beyond the College level, any office that disagrees with the previous recommendation must submit a separate rationale and append it to this document with appropriate signature.)

1	_____ Recommendation: Signature of person preparing the report:	_____ Date: 2/20/06
1	_____ Recommendation: Signature of Program Chair:	_____ Date: 2/20/06
1	_____ Recommendation: Signature of Academic Dean:	_____ Date: 2/20/06
	_____ Recommendation: Signature of Chair, Academic Planning Committee: (Baccalaureate pgms only)	_____ Date:
1	_____ Recommendation: Signature of President, Faculty Senate/ Chair, Graduate Council:	_____ Date: 24 Feb 2006
	_____ Recommendation: Signature of the Provost and Senior Vice President for Academic Affairs:	_____ Date:
	_____ Recommendation: Signature of the President:	_____ Date:
	_____ Recommendation: Signature of Chair, Board of Governors:	_____ Date:

Dean's Statement

Master of Science, Environmental Science

The Master of Science in Environmental Science has a long history of providing current, meaningful, convenient graduate education to working professionals in the Charleston-Huntington region, and especially on the South Charleston campus. Its current and former students include employed engineers, environmental scientists, DEP secretaries and other administrators, and many others who bring a rich array of experiences and educational backgrounds to the classroom environment.

The program is administered within CITE's Division of Applied Science and Technology, and coordinated by faculty on the South Charleston campus who have close working relationships with the professional community and who do an excellent job of keeping the program fresh and up-to-date. Faculty from CITE's other programs also teach in the program and participate in comprehensive project committees, and the program employs expert adjunct faculty from the engineering consulting and government agencies, as necessary and appropriate for the subject matter.

The MS in Environmental Science remains one of CITE's most popular graduate programs, and continues to provide an important service to the professionals in the region who must remain current in a field that continually experiences rapid change due to technological innovations and developments in policy and regulatory requirements. Consequently, I strongly recommend that the program be continued at its current level.

Betsy Ennis Dulin
Dean
College of Information Technology and Engineering

College/School Dean's Recommendation

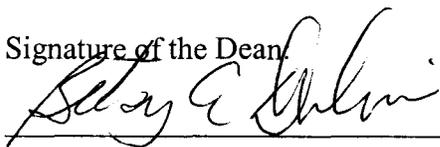
Deans, please indicate your recommendation and submit the rationale.

Recommendation:

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)

Signature of the Dean



Date:

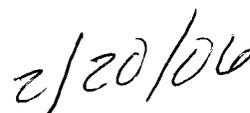


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Environmental Science Masters Degree

at

Marshall University

I. Program Description

The Master of Science in Environmental Science program is one of five graduate programs within the College of Information Technology and Engineering (CITE). It is housed in the Division of Applied Science and Technology, one of two divisions of the College. Originally developed at the West Virginia College of Graduate Studies (COGS), the Environmental Science program has been part of Marshall University Graduate College (MUGC) since the merger of the two institutions, July 1, 1997. In this degree program, students from diverse science backgrounds apply their knowledge and skills to such environmental problems as air pollution and control; water pollution and treatment; groundwater protection, contamination and remediation; solid and hazardous waste management; and the indoor (workplace) environment. The environmental science program gives the student the broad multi-disciplinary subject matter and analytical tools necessary to be successful in such professions as consulting, industrial environmental management and environmental protection. The graduate Environmental Science program serves a diverse population of recent BS graduates and practicing professionals who deal with the impact of modern civilization on the natural environment. It is a multi-disciplinary program, focusing on the application of biology, chemistry, engineering, geology, law, economics, public policy, statistics, and toxicology to the solution of problems of air pollution, river and stream pollution, ground water pollution, and workplace contamination. The program has been particularly beneficial to professionals who live and work in West Virginia. Through this program, scientists upgrade their skills and qualify for promotions and increased responsibility at their own companies and agencies. Additionally, recent BS recipients bring their diverse undergrad backgrounds and degrees to specialize in the ES field by gaining specialized and practical knowledge and experience. All students improve the overall quality of the workforce in the state and region.

II. Accreditation Information

The MS in Environmental Science program is currently not seeking any program specific accreditation.

III. Program Statement

A. Adequacy

1. Curriculum.

The curriculum, shown in Appendix I, is designed to provide students with a broad awareness of issues, depth in a specialized area of their choosing, and the tools needed to

deal with current pollution problems. In addition to taking the required number of courses, students must demonstrate that they have had instruction or experience in the behavior of the natural environment, analytical measurement of pollutants, and the application of environmental regulations. Students satisfy these requirements by judicious choice of elective courses.

For example, Risk Assessment (ES 614), a foundation course, presents a broad perspective on how environmental protection decisions are made and how the harmfulness of pollutants is determined in a quantitative manner. Students are required to take courses in Environmental Chemistry (ENVE 615), Environmental Law (ES 660), and Environmental Management Systems (ES 620). In addition, there are four courses common to three of the graduate programs in the College which are required of Environmental Science majors. These are, Project Management (EM 660), Applied Statistics (ENGR 610), Comprehensive Project I (TE 698), and Comprehensive Project II (TE 699). There are four electives: two Environmental Science related electives in the Environmental Science program, an approved course in the Division, and an approved course in the College. Students may also take, and are encouraged to do so, other electives within the University, mostly from the College of Science, with approval. Students select electives to specialize in areas such as air pollution, river and lake pollution, policy, and groundwater pollution. Students must also satisfy the expectation that they have knowledge of the behavior of natural systems and the analytical measurement of chemicals in the environment. Finally, there are the comprehensive project courses (Part I and Part II) in which the student shows mastery of these skills by applying them to a real world problem.

The most significant feature of the program is that the roughly half of the students consist of scientists with five to fifteen years of experience in one of the traditional specialties needed in the solution of environmental problems, such as biology, chemistry or geology. However, since the last program review the percentage of full-time, traditional students (those recently completing a BS and with little or no experience) has markedly increased, as has the number of international students. This combination of working, experienced professionals and inexperienced younger students is seen as a major strength of the program, allowing working professionals to increase their skills and knowledge while serving as mentors to younger students. Younger students receive considerable “real-world” knowledge, as faculty and seasoned students share their professional experiences in class.

2. Faculty.

The Environmental Science program is multi-disciplinary in nature. There is one faculty member/program coordinator for the program. There is also supporting and adjunct faculty that also have the diverse disciplinary skills and experience needed to solve environmental problems. The current full-time faculty member is a Ph.D. non-tenured environmental engineer with approximately 13 years of private sector and government environmental science and engineering experience. Supporting full-time faculty include from the MS Engineering program one tenured PhD environmental engineer, and one tenured PhD biologist from COS/IST.

The full-time faculty within the program shows a marked decrease (roughly half) from 5 years ago, when 2 full-time faculty and 4 supporting faculty were available for the program, while student numbers have increased in the 5 year period. For example, total enrollment in the program in Spring 2001 was 39, while Spring 2006 enrollment is more than 63. In fact, the ES program has the most enrollments for Spring 06 of any CITE graduate program. It should also be noted that the one full-time faculty member/program coordinator also teaches courses in the Environmental Engineering program. Lack of full-time faculty is a weakness of the program and is cited as such by exiting students, as many complete the entire program with only one faculty member teaching all of their ES courses.

Adjunct faculty include a statistician holding a Ph.D. in Statistics, a research scientist holding a Ph.D. in Aquatic Biology, an MS toxicologist, and an environmental engineer. See appendix II for the Faculty Data Sheets. No graduate teaching assistants are used, so Appendix II-A was not completed.

The student's contact with adjunct faculty has unfortunately increased since the last evaluation, rising from about 20 % in 2000 to approximately 50% today.

	2000		2006	
	Courses	Sections	Courses	Sections
Full-time	5	13	3	5
Adjunct	2	3 (20%)	3	5 (50%)

3. Students

(a) Entrance standards.

Each applicant for admission must have an undergraduate degree from an accredited college or university, and must satisfy at least ONE of the following criteria:

- Score at the mean or above on the verbal GRE
- Score at the mean or above on the quantitative GRE
- Score at the mean or above on the analytical GRE
- Score at the mean or above on the Miller Analogies Test
- Have an undergraduate GPA of 2.50 or above
- Have passed the Fundamentals of Engineering (F.E.) exam and/or the Professional Engineer (P.E.) exam

In other words, if the final undergraduate GPA is 2.5 or above you are exempt from taking the standardized test (GRE or MAT).

In addition to the general requirements all students entering the graduate Environmental Science program must have completed prior to admission the following courses OR their equivalent:

Chemistry 211 and Math 130 with a grade C or better, AND a minimum total of FIVE (5) courses/competencies, relevant to environmental science, from the following: Chemistry (200 level or above); Physics (200 level or above); Biology; Geology; Geography; Statistics; Soil Science; Law; Health and Economics; or 10 years relevant work experience.

For admission to the program, the student generally must have an academic background in one of the sciences involved in environmental solutions. The most popular areas are biology, chemistry, and geology, but there are many others, including forensic science, medical technology, meteorology, and physics.

(b) Entrance abilities.

In previous reports the standardized scores of Environmental Science students were compared with those of all West Virginia Graduate College students. For this report, the averages for all graduate students at Marshall University are available. It should be noted that these averages are negatively skewed for the ES program and CITE. As students with good undergraduate GPA's (2.5 and above) are not required to take the GRE for several CITE graduate programs including the ES program, the average GRE scores are correspondingly low. In short, the high achieving students that would increase the GRE average do not take the GRE.

Office of Institutional Research
Average GRE Score - Incoming Students
By College
Fall semesters 2000 through 2004

College:		Incoming Students	VERBAL		QUANT		ANALYTIC	
		#	#	Mean	#	Mean	#	Mean
Business	Fall 00	103	38	441.84	38	511.05	37	540.27
	Fall 01	111	48	442.71	48	503.33	48	552.08
	Fall 02	132	45	448.89	45	490.22	41	538.54
	Fall 03	110	45	436.22	45	514.22	26	536.71
	Fall 04	108	41	422.93	41	493.41	13	528.46
	Overall	564	217	438.76	217	502.35	165	541.78
CITE	Fall 00	37	14	462.14	14	594.29	14	564.29
	Fall 01	47	22	427.73	22	560.91	22	520.00
	Fall 02	67	31	459.35	31	531.29	28	512.50
	Fall 03	42	19	463.68	19	565.79	3	576.67
	Fall 04	33	16	473.75	16	583.75	3	593.33
	Overall	226	102	455.98	102	560.98	70	531.43
Education and Hum Serv	Fall 00	245	99	412.22	99	456.97	98	496.53
	Fall 01	449	134	410.30	134	444.48	125	505.60
	Fall 02	456	147	393.40	147	432.52	109	487.25
	Fall 03	390	136	402.94	136	451.76	24	451.54
	Fall 04	504	110	421.91	110	467.27	13	570.77
	Overall	2044	626	407.08	626	449.23	369	496.55
Fine Arts	Fall 00	10	3	470.00	3	526.67	3	510.00
	Fall 01	11	6	383.33	6	335.00	6	398.33
	Fall 02	9	5	390.00	5	366.00	4	420.00
	Fall 03	11	1	350.00	1	400.00	0	.
	Fall 04	9	3	486.67	3	510.00	0	.
	Overall	50	18	415.00	18	408.33	13	430.77
Graduate	Fall 00	69	11	458.18	11	467.27	10	519.00
	Fall 01	51	12	452.50	12	516.67	7	480.00
	Fall 02	63	17	446.47	17	444.71	9	516.67
	Fall 03	65	10	471.00	10	461.00	3	630.00

(Continued)

(c) Exit abilities.

Students who finish this program are expected to have a broad awareness of environmental problems, considerable depth in the identification, analysis, legal requirements, and correction of problems in the student's area of specialty, and the measurement, statistical, and management tools needed to manage their work. Exams are used in each course to determine whether students are learning these knowledge areas. - The student must have finished three-fourths of the program in order to be eligible to begin a project, which involves a defense of the proposal, research, an extensive report, and an oral presentation. Each student is questioned by both the full-time faculty and by a representative of local industry. Both the faculty and the local industry representatives are well satisfied with the quality of the students, as exhibited by their performance in this area. Faculty maintain contact with local industry and government agencies where graduates are employed to insure employer satisfaction with the program.

4. Resources.

(a) Financial.

Financial support of the program consists of the salary of one faculty member, and part of the salaries of the Associate Dean, Instructional Technologist and Division Secretary, see table below. Office space, current expense and travel funds are resources also provided. There is a designated laboratory facility adjacent to the South Charleston campus but none in Huntington at this time. The ES faculty member provides some support to other programs, and one full-time faculty member from another program provides support to this program (see Faculty Data).

State Funds	\$ 3,800.00
Salaries	\$ 98,665.00
Off-Campus Contract	\$ 12,250.00
Student Fees	\$ 3,000.00
Total	\$ 117,714.60

If this program was terminated, and the Division Chair continued to oversee the other programs in the Division, one faculty salary would be saved. However, as the faculty member teaches courses in other programs, the other programs would require replacements to teach the courses. In addition, as faculty from other programs teach courses in the Environmental Science program their course-loads would be affected by the termination of the program.

(b) Facilities.

Facilities available to the program include classrooms, audio-visual equipment, library materials, computer laboratory facilities, access to the Internet, and access to Compressed Video (ATM) classrooms and equipment, and Instructional Television Services staff. A laboratory is available at the Dow Center adjacent to the South Charleston campus, but none is available on the main campus, a weakness of the program. It is critical to the long-term viability of the program to look into acquiring the use of laboratory space and equipment on both campuses. The primary need would be for lab work, field work equipment, and student and faculty research. The laboratory would also provide a place for students to calibrate as well as store field equipment, a critical need in a field that requires a great deal of field work. A continuing weakness of the program to students is the lack of lab space to complete coursework and projects.

5. Assessment Information

(a) *Summarize the principal elements of the departmental assessment plan.*

The Environmental Science program is actively involved in all aspects of the assessment process, except for practical, professional accreditation and certification, which do not apply. A more informal assessment is also carried out during the student's defense of the comprehensive project. Local employers attend, and this affords an opportunity to directly observe the way in which the business community evaluates the student's overall

knowledge of Environmental Science. Additionally, the Program Coordinator maintains contact with graduates, as well as maintaining professional relationships with employers throughout the region.

FOCUS	Pre-instructional Period	Instructional Period	Exit/Graduation	Follow-Up
Student	Admissions	Class Performance Examination Practical Thesis/Final Project	Comprehensive Examinations Exit Review	Graduate Survey
Faculty	Selection	Student Evaluation of Faculty RPT Review Dean's RPT Review Peer Evaluation Faculty Merit Review		Graduate Survey
Program	Academic Affairs Committee Review Program Admissions Report (proposed) Student Profile (proposed)	Internal Program Review Self-Study for External Program Review Accreditation Review Continuing Education Certification Professional Standards Compliance Enrollment and Attrition Studies	Comprehensive Examination Analysis Graduate Rate Analysis Employment Studies	Graduate Survey
Environmental Factors		Faculty Assessment of Sites and Services		Graduate Survey

(b) Provide summary information on the following elements: Educational goals of the program

The goals of the Environmental Science program at Marshall University are in harmony with, and contribute to, the mission of Marshall University as described in its current mission statement. In particular, the mission statement cites the importance that students use their knowledge, creativity, and critical thinking skills to make their communities better places in which to live; and to examine critically the many issues facing society and, through the process of civil discourse, prepare themselves to become socially responsible individuals who contribute to the betterment of society. The primary goal of the Environmental Science program is to improve the effectiveness of environmental scientists and managers in their efforts to protect the public health and welfare with respect to environmental pollution. A second goal is to provide a forum for trained professionals to exchange information regarding protection of the environment. A third goal is to provide the community with information, resources and trained professionals to assist them in making effective choices in public debate and private decisions regarding the environment. It is recognized that these goals must be carried out with a commitment to diversity of the student body and faculty. The program intends to accomplish this with the following specific goals. See Chart I titled Assessment Summary in the Appendix.

Measures of evaluating success in achieving goals

1. Academic Achievement measures: Increase the effectiveness that students have on the job; increase students' opportunities for advancement; prepare students for further education, such as Ph.D. programs, schools of law, and other forms of higher education, and assure that student proficiency is commensurate with the requirements

of the field. Success is measured using a graduate satisfaction survey and direct inquiry of employers.

2. Curriculum Development measures: Keep course content up to date; add new courses when needed; maintain balance between courses for majors and non-majors; produce students who can practice effectively as environmental professionals; and provide an efficient and user-friendly teaching atmosphere. Outside experts and blue-ribbon student panels previously looked at all aspects of the program, which were followed up with focus group meetings involving local employers.
3. Faculty Development measures: Maintain a faculty that is competitive with practicing professionals in their field; maintain a faculty that keeps up to date; provide motivation for students and recognize different learning styles; maintain a faculty whose competence and expertise covers all subject areas needed to protect the environment; and maintain leadership in the community with regard to pollution control. Evaluation same as “B” above.
4. Overall Program measures: Provide technical information to the professional and general community in the form of courses, seminars, library holdings and student reports in those subject areas necessary to protect the environment in West Virginia; offer courses and seminars at convenient times; register students in a convenient and respectful manner; maintain cultural and ethnic diversity; provide financial assistance to those students who need it; secure adequate resources to support the program. Evaluation same as “B” above.
5. Academic Achievement measures. The program is receiving good feedback, largely anecdotal, that Environmental Science students are effective on the job and experience advancement, and that a good percentage of them go on for further education, such as Ph.D. programs, schools of law, and other forms of higher education. For example, the student’s supervisor often attends the oral presentation of their comprehensive project. This provides the faculty an opportunity to discuss the value of the project to the workplace. Also faculty meet local senior managers in conferences and professional meetings.
6. Curriculum and Faculty Development measures. Efforts are continually being made to be responsive to the needs of the community: keeping courses relevant and current, adding new courses when needed. In fact, 3 new, relevant courses have recently been added to the program. Additionally, an area of emphasis in Water Resources Management is being added, which is closely tied with similar supporting programs in COS. Also, this year will see e-courses offered in the program for the first time, starting in Summer 06. While the students have other sources of education, such as technical seminars at professional society meetings, CITE has maintained a competitive advantage over these other sources. The program is endeavoring to attract more students through a new topical short-course, for example, and take advantage of the fact that CITE has an excellent knowledge base for the region. However, continued investment in faculty development is needed to maintain this competitive edge.
7. Overall Program measures. Dissatisfaction regarding physical facilities are often

mentioned, especially the lack of lab space. Additionally, lack of faculty forces an over-reliance on video-link, which is an excellent tool for some courses and content, but not all.

Essential skills are assessed during the exit evaluation, as described previously in the section on exit abilities. After the evaluation of each student, the faculty and outside evaluator discuss the skills observed. The discussion focuses on the skills essential for work in this field, in connection with the syllabi of the courses in the program. When weaknesses are observed, a review is conducted of the course syllabi offering such skills. If the courses do not adequately deal with the skills, course changes are recommended. If the courses adequately deal with the skills, but the student shows weakness, the course exams and other evaluation measures are reviewed.

(c) ***Provide information on how assessment data is used to improve program quality. Include specific examples.***

As a result of the ongoing evaluation process within the program, including exit interviews and ongoing relationships with employers and professionals in the field, several improvements have been made in the program. In most of these cases, the program was not failing to provide the education as planned. Instead, the field had changed, job requirements were different, and skills were needed that had not been previously identified. Changes carried out as a result of this process include increased emphases on risk, toxicology and geotechnology, and new courses in surface water hydrology, water resources management, and brownfields management. Additionally, on-line content and on-line courses are increasingly used. During previous review periods, changes included creation of new courses on regulations, workplace issues, hydrogeology, ethics issues, site assessment and geographical information systems.

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

6. Previous reviews.

In 1992, the entire School (at WVGC) was asked to restructure all of its programs, to reduce the number of separate degrees. As part of this restructuring, the former Environmental Studies program was split into Environmental Science and Environmental Engineering. The latter program is now part of the Division of Engineering.

As a result of the 2001 review, the program was approved for continuation as is.

7. Strengths and weaknesses.

Strengths

As emphasized by graduate and employer satisfaction, the program is an asset to West Virginia because it offers a wide variety of classes, at convenient times and locations, presents highly relevant material, and in a challenging way, to both mature, high quality students having considerable relevant work experience and recent BS graduates with little or no experience. The program has been responsive to local needs, and has received compliments from both graduates and local employers on its benefits to individuals and to West Virginia's economic development. This is seen as a very significant strength.

The task of keeping up with technological advances and professional practices is increasingly challenging. The use of adjunct faculty allows the program to expose the students to the skills and knowledge of professionals practicing in the field. The full-time faculty is focused on teaching core courses and research activities; the program relies on adjunct-faculty to teach specific courses or as guest lecturers in other courses, which benefits the students through exposure to expertise and real-world issues. Due to the continuing changes in the field, the program emphasizes keeping courses up to date, adding new courses when needed and in educating faculty. The program is providing more resources to keep faculty up-dated. Keeping current and up-to-date is a major emphasis for the program.

The program has grown nearly continuously since the last evaluation period, and is one of the larger graduate programs in CITE.

Weaknesses

The lack of a second full-time faculty member is a weakness in the program. A second faculty member is needed to maintain the quality education, mentoring and advising for the program.

While the compressed video system is an excellent way of taking advantage of limited resources, it is not without shortcomings. Currently, software is being explored that would allow anyone with an internet connection to view lectures and interact, which may address some of the shortcomings of distance education. However, as there is a shortage of faculty, teaching 2 sections at a time through video-link continues to be necessary.

Lack of appropriate lab space prevents students from receiving adequate real-world and hands-on experience. It also prevents faculty and students from conducting meaningful research.

B. Viability.

1. Articulation Agreements. *List program specific articulation agreements with other institutions for delivery of this program.*

The program is provided in its entirety at Shawnee State University in Portsmouth, Ohio. This offering of an MU program out-of-state is rare. The HEPC reviewed the offering of courses at Shawnee State as an informational item, and permission was granted by the Ohio Board of Regents for the offering of this program in Ohio.

2. Off-Campus Classes. *List off-main-campus courses offered and locations for the last two years. (Include as Appendix III)*

Courses offered at Shawnee State are listed in appendix III. Additionally, more program content will be offered as e-courses, beginning in Summer 2006, which will make program content available literally world-wide.

3. Service Courses. *List departmental courses that are required for students in other majors and support programs outside the major. (Include as Appendix IV)*

Students in the Environmental Engineering program have two required courses in Environmental Science and often take additional electives in this program. Students in Engineering Management are required to take a three-course minor, and those interested in Environment Science are accommodated in classes. College of Science master's students have been taking ES courses as electives. Students majoring in Science Education have been taking Environmental Science courses as their ES science specialty courses. As this demand increases, other methods to be of service to this group will be explored. Appendix IV is attached.

4. Program Course Enrollment.

One of the foundation courses, Risk Assessment, presents a broad perspective on how environmental protection decisions are made and how the harmfulness of pollutants is determined in a quantitative manner. Students are required to take additional courses in Environmental Law and Environmental Management Systems. There are two Environmental Science related electives to be taken in the program. Electives available include Introduction to Environmental Science, Dynamics of Ecosystems, Environmental Site Assessment, Environmental Testing and Monitoring, Environmental Ethics, Wetland Ecology, Groundwater Principles, Vegetation of West Virginia, Applied Hydrogeology, Plant Taxonomy, Environmental Policy, Environmental Regulations, and Air Pollution. Appendix V lists the courses offered and the enrollments.

5. Enrollment

Data are shown in Appendix VI.

6. Enrollment Projections

The need for this program is expected to continue indefinitely. The damage that has been caused to the environment in the last 100 years is so extensive that a clean-up will take many additional years, and the knowledge offered in this program will play a key role in that effort. There is also the continuous ratcheting upwards of environmental standards and increasing regulations. In addition, with the world changing at such a rapid pace, there will always be a need by those who have graduated to take courses that will bring them up to date. As experience and familiarity with current practice is now a major requirement for getting a job, then so long as CITE continues to offer that “up-to-date edge” the courses will continue to be in demand. Additionally, world-wide environmental awareness is increasing, and US expertise is in demand, witnessed in part by the increasing number of international students in the ES program.

The trend of increasing enrollments in the program is expected to continue.

C. Necessity

1. Advisory Committee

There is a College Advisory Board which provides input to the CITE degree programs. Examples of changes to the program made based on input from the Advisory Board include the addition of increased technical writing requirements, increased statistical requirements, and providing recognition of 10 years professional work experience for admission to the program.

2. Graduates.

Many of the students in the Environmental Science graduate program are employed full-time in directly related fields. They work in the environmental protection departments of state and regional industry, science and engineering consulting firms, local, state and federal government agencies tasked with environmental protection, and other places of employment at which emissions to the environment might occur. For example, United Parcel Service needs to be able to respond to a chemical leak of any package they carry, and they also operate a very large deicing program for their airplanes. Some students work for consulting firms that provide services to manufacturers related to pollution, or for laboratories that analyze pollutants.

Students regularly report that they find opportunities for advancement, usually within their companies, as a result of what they learned in the Environment Science program. Several calls are received each semester from students who state that their current opportunity would not have come without the program. Many find that they have reaped most of the rewards from what they learned by participating in the program (rather than

from the resulting diploma), and the final effort to receive the diploma is sometimes done primarily for personal rather than professional reasons.

The Environmental Science program has worked very closely with adjunct faculty and with industrial and government representatives on exit review committees and through professional association. The informal feedback from these people, combined with the professionalism and impartiality of the graduate satisfaction survey, was sufficient to provide good feedback. Adjustments were made to the attributes of the program based on the feedback, with highly successful results. These adjustments have included entrance requirements, new courses, and a thesis option. The Environmental Science program works very closely with industry and employers through adjuncts, focus groups, professional relationships, and professional meetings.

Overall, through regular contact between the faculty and graduates and their employers at professional activities and informal meetings, there is a sense that both graduate and employer satisfaction with this program is high. At least several times each year, CITE faculty receive comments regarding the need for the program to continue to offer technically strong courses. There are regular requests for new courses or new emphases each time a new development in the field emerges. The fact that local professionals ask the University to fill this need is an indication that they believe CITE would do a good job. CITE in general, and the Environmental Science program in particular, have endeavored to be very responsive to the needs of industry.

Annual salaries are not reported to us, but informal feedback indicates a range of \$30,000 to \$80,000. Since the salary is strongly dependent on the field of the student's previous degree, it is difficult to obtain all of the information needed in order to analyze salaries.

3. Job Placement

As stated above, students obtain a traditional degree in biology, chemistry or geology, and then get a job in industry or government, or go straight to graduate school. Approximately half of the students in the program already have professional level jobs in the field. An increasing number of students, however, are looking for their first professional position. What is unique about the program is that few undergrad degrees prepare students for work in the environmental field. The knowledge necessary to work and/or move up in the field is generally gained through on-the-job training, or a graduate degree such as the ES program offers. Therefore, the ES program has been an excellent way for students to get into the environmental field. For other students, after finding employment, they later get assigned to work in the environmental department. Then they come to CITE for a master's degree.

The program does have the "advantage" that the extent of pollution in West Virginia has attracted dozens of national consulting firms here, and many maintain offices locally. The high acceptance of the program and of the graduates by these companies indicates that employer needs were being met at least as well as any major metropolitan area in the country.

D. Consistency with University Mission.

The goals of the Environmental Science program at Marshall University are in harmony with, and contribute to, the mission of Marshall University. In particular, the program contributes to the enhancement of graduate education, expansion of the body of knowledge, commitment to society through public service, economic development, diversity in student body, faculty, staff and education programs, maintenance of rigorous standards and high expectations for student learning and performance, and interaction with individual students. As the primary goal of the Environmental Science program is to improve the effectiveness of environmental scientists and managers in their efforts to protect the public health and welfare with respect to environmental pollution, it fits well with the mission of the institution.

This program is closely tied to other programs in the College of Information Technology and Engineering. Five components of the College mission are of particular note, and are listed here, along with a description of how this program fits with and supports the College and its other programs.

- 1) Maintain a small full time faculty and a strong adjunct faculty.** The Program maintains close contact with many professionals in the region. Because of the diversity and strength of these people, and because they are willing to teach, the expertise among adjuncts is very high, affording diversity and depth.
- 2) Provide opportunities for lifelong learning.** The course offerings are oriented around knowledge not available to students when they were undergraduates. Thus, students come for lifelong learning, and the diploma they receive is a secondary consideration.
- 3) Make graduate study accessible to students.** All courses are taught on weekdays during the late afternoon or evenings or on-line. Programs have been offered in various cities whenever such an offering seemed to be viable and cost effective. As an example, the degree was offered in Bluefield for 17 students, with each course offered once during a three year period.
- 4) Support economic development of the State.** Prior to the start of this program, many companies solved environmental problems in West Virginia by looking elsewhere for the needed expertise. Many students are now filling these positions involving greater expertise and greater responsibility as a result of the knowledge gained in these courses.
- 5) Share faculty and facilities.** This is a multi-disciplinary program, involving the integration of knowledge from many areas. Faculty from these related areas as an integral part of the program are brought in. Courses in Biology, Chemistry, Engineering Management, Environmental Engineering, Industrial Engineering, and Information Systems, with electives in Chemical Engineering, Geology, Humanities, Industrial Hygiene and Safety are required. Another example is the mutual support with the Engineering Management and Environmental Engineering options in the Engineering program. Students take courses in those fields to meet proficiency requirements, and their students are permitted to take a minor in an environmental specialty.

IV. Program of Excellence.

No designation of Excellence is being requested at this time.

Appendices

APPENDIX I: Course Listing

Institution: Marshall University

Person Responsible
For Report:

Dr. D. Scott Simonton

Degree Program: Environmental Science

Courses Required In Major (by Title and Course Number)	Total Required Hours	Additional Credit Required In Major	Total Hours	Related Fields Courses Required	Total Hours	Required In General Studies/ Electives	Total for Degree
ES 614 Risk Assessment	3	Environmental Science Elective	3	EM 660 Project Management	3		
ENVE 615 Environmental Chemistry	3	Environmental Science Elective	3	ENGR 610 Applied Statistics	3		
ES 660 Environmental Law	3	Elective within the Division	3	TE 698 Comprehensive Project I	3		
ES 620 Environmental Management Systems	3	Elective within the College	3	TE 699 Comprehensive Project II	3		
TOTALS	12		12		12		36

Professional society that may have influenced the program offering and requirements: None

Appendix II: Faculty Data

FULL-TIME FACULTY

Dr. D. Scott Simonton, Coordinator of Environmental Science Program

Contributing to M.S. ES program:

Dr. Rick McCormick, Environmental Engineering Program

Dr. Mike Little, COS IST

ADJUNCT FACULTY

Ms. Dawn Seeburger

Mr. Erik Baldwin

FACULTY DATA SHEET

Name: D. Scott Simonton

Rank: Associate Professor

Check One: Full time: Part-time: Adjunct: Graduate Assistant:

Highest degree Earned; Ph.D. Conferred by: University of New Mexico

Date Degree Received: 2002 Area of Specialization: Environmental Engineering

Professional registration/licensure: Professional Engineer

Years of Employment at present institution: 4
 Years of employment in higher education: 4
 Years of related experience outside higher education: 13

To determine compatibility of credentials with assignment:

a. List courses you taught this year and those you taught last year:

<u>Year/Semester</u>	<u>Course Number and Title</u>	<u>Sections</u>
2006/Sp	ENVE 625 Hazardous Waste Management	2
	ES 630 Environmental Site Assessment	1
	ES 640 Groundwater Principles and Monitoring	2
	ES 662 Environmental Policy	2
2005/Fa	ENVE 682 Environmental Remediation Technology	1
	ES 650 Water Resources Management	2
	ES 654 Environmental Microbiology	2
2005/Su	ES 614 Environmental Risk Assessment	1
2005/Sp	ENVE 681 Environmental Engineering Design	1
	ES 610 Environmental Sampling Practice	1
	ES 614 Environmental Risk Assessment	1
2004/Fall	ENVE 625 Hazardous Waste Management	2
	ES 640 Groundwater Principles and Monitoring	2
	ES 650 Water Resources Management	2

Identify your professional development activities during the last five years:

Vice-Chair, WV Environmental Quality Board, appointed by Governor Wise 2003
 Registered Professional Engineer conducting consulting services

Invited speaker, 2004, 2005 WV Air and Hazardous Waste Association Annual meeting

Faculty Data Sheet

(for the period of this review)

Name: Erik Ronald Baldwin Rank: _____

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

Highest Degree Earned: M.S. in Engineering Date Degree Received: December 2004

Conferred by: Marshall University Graduate College

Area of Specialization: Environmental Engineering

Professional Registration/Licensure Engineer Intern Agency: WV State Board of Registration for Professional Engineers

Years non-teaching experience 10.5

Years of employment other than Marshall 0.5

Years of employment at Marshall 0

Years of employment in higher education 0.5

Years in service at Marshall during this period of review 0

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)

Year/Semester	Alpha Des. & No.	Title	Enrollment

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: Michael Little Rank: Professor

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

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

Conferred by: University of Louisville

Area of Specialization: Biology

Professional Registration/Licensure _____ Agency: _____

Years non-teaching experience	2
Years of employment other than Marshall	7
Years of employment at Marshall	31
Years of employment in higher education	31
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)

Year/Semester	Alpha Des. & No.	Title	Enrollment
2005/Spring	IST 301	Public Service Experience	17
2005/Spring	IST 323	Assessment II: Aquatic Ecology	11
2004/Fall	IST 301	Public Service Experience	13
2004/Fall	IST 322	Assessment I: Terrestrial Systems	9
2004/Fall	IST 483	SpTp: GIS & Integrated Systems	15
2004/Spring	IST 301	Public Service Experience	22
2004/Spring	IST 323	Assessment II: Aquatic Ecology	9
2003/Fall	IST 301	Public Service Experience	17
2003/Fall	IST 322	Assessment I: Terrestrial Systems	12
2003/Fall	IST 483	SpTp: Spatial Analysis for the Environment	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. Biology background has been enhanced with experience working for USGS, US FWS, WV DNR, and other agencies **(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.
Attendance at critical thinking workshops
- 3 Discipline-related books/papers published (provide a full citation).
- 4 Papers presented at state, regional, national, or international conferences.

Two presentations at the Ohio River Biological Consortium Annual Meetings, 2005

- 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. \$145000 Dominion Power, Stream Modeling of an Impacted river system \$50000 US DOH Modeling Fish Crossings in Southern WV \$29000 No Child Left Behind Education Grant
- 7 Awards/honors (including invitations to speak in your area of expertise) or special recognition.
2003 Drinko Fellow
- 8 Community service as defined in the *Greenbook*.

Faculty Data Sheet

(for the period of this review)

Name: Richard F. McCormick Rank: Professor

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

Highest Degree Earned: PhD Date Degree Received: July 1979

Conferred by: Virginia Polytechnic Institute and State University

Area of Specialization: Civil Engineering

Professional Registration/Licensure Professional Engineer (PE) and Professional Surveyor (PS) Agency: WV Board of Registration for Professional Engineers and WV Board of Registration for Professional Surveyors

Years non-teaching experience 1.5
 Years of employment other than Marshall 31
 Years of employment at Marshall 3
 Years of employment in higher education 32.5
 Years in service at Marshall during this period of review 3

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)

Year/Semester	Alpha Des. & No.	Title	Enrollment
05/Fall	UNI 101	Freshman Seminar	18
05/Fall	ENGR 213	Statics	27
05/Fall	ENGR 218	Fluid Mechanics	12
05/Fall	ENVE 615	Environmental Chemistry	12
05/Spring	ENGR 214	Dynamics	14
05/Spring	ENGR 216	Mechanics of Deformable Bodies	16
04/Fall	UNI 101	Freshman Seminar	17
04/Fall	ENGR 213	Statics	22
04/Fall	ENGR 280	Introduction to Geomatics	9
04/Fall	ENVE 615	Environmental Chemistry	8
04/Spring	ENGR 216	Mechanics of Deformable Bodies	9
04/Spring	ENVE 616	Principles of Biological Waste Treatment	4

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. Not applicable

(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 6 new undergraduate courses as well as developing all or parts of five laboratories.

(b) In the three years that I have been at Marshall, I have supervised seven masters level students through the completion of their degrees.

(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

(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

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 EEAE at EPSCOR Day at the legislature
- k. February 23, 2004—gave presentation on EEAE 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.
- o. March 24, 2004—represented Marshall and CITE at the Engineering EXPO in Charleston.
- 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 EEAE 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
- t. November 13, 2004—gave two presentations on engineering careers and Marshall's engineering programs at Marshall's Open House.
- 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 EEAE 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)

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: Dawn Seeburger Rank: _____

Status (Check one): Full-time_____ Part-time_____ AdjunctX Current MU Faculty: ___yes ___no

Highest Degree Earned: MS Date Degree Received5/94

Conferred byCentral Michigan University

Area of SpecializationEnvironmental Toxicology

Professional Registration/LicensureLRS AgencyWVDEP

Years non-teaching experience 25

Years of employment other than Marshall 25

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)

Year/Semester	Alpha Des. & No.	Title	Enrollment
ES646		Dynamics of Ecosystems	3
ES662		Environmental Policy	3
ES604		Air Pollution	8

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*.

**Appendix II-A
Not applicable**

**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.

Year	Location	Courses Offered	Enrollment
Sp 05	Shawnee State University (SSU)	ES 620	5
Sp 05	SSU	TE 699	2
F 04	SSU	ES 646	3
F 04	SSU	ES 662	4
Sp 04	SSU	ES 660	6
Fall 03	SSU	ES 646	3
Fall 03	SSU	ES 662	7

Appendix IV
Service Courses

Course Number	Course Name	Year 1 2000-2001			Year 2 2001-2002			Year 3 2002-2003			Year 4 2003-2004			Year 5 2004-2005		
		Su	Fa	Sp												
ES 614	Env. Risk, Assessm.		14				10			32				22		9
ES 660	Env. Law I		30				20			31			24			

Information based on CITE enrollments

Appendix V: Courses for Majors Program Course Enrollment

Course Number	Course Name	Required/ Elective	Year 1 2000-2001			Year 2 2001-2002			Year 3 2002-2003			Year 4 2003-2004			Year 5 2004-2005		
			Su	Fa	Sp												
i.e. 215*																	
ES 660	Intro to Env. Sci.	Elective											7				
ES 603	Seminar in Curr. Env.	Elective										7			8		
ES 604	Air Pollution	Elective															6
ES 610	Envr. Sampling Prac.	Elective			1												14
ES 614	Env. Risk, Assessm.	Required		14				10			32				22		9
ES 620	Env. Mgmt. Sys.	Required											14				18
ES 626	Remote Sen. & Map	Elective									7						
ES 630	Env. Site Assessm.	Elective											20				
ES 640	Grnd. Wtr. Princ. & M	Elective			12												14
ES 646	Dynam. Of Ecosys.	Required						16			12						9
ES 650	Special Topics	Elective						10			24				9		14
ES 651	Env. Microbiology	Elective								9					16		
ES 655	Env. Ethics	Required or ES 660 or ES 662			25						17				9		14
ES 660	Env. Law I	Required or ES 662 or ES 655		30				20			31				24		
ES 661	Env. Regulations	Elective						8									5
ES 662	Env. Policy	Required or ES 655 or ES 660						14						10			7
ES 663	Env. Law III	Elective											6				

(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

Year	Number of Applicants	Number of Admissions	Enrollees	No. of Graduates
98/99	*	*	47	9
97/98	15	11	49	11
96/97	10	13	48	11
95/96	11	14	51	6
94/95	45	34	87	10

Note: * Data not available

Chart I Assessment Summary
Marshall University
Assessment of Student Outcomes: Component/Course/Program Level
5 year summary

Component Area/Program/Discipline: Environmental Science

Component / Course / Program Level					
Student Outcome	Person or Office Responsible	Assessment Tool or Approach	Standards/Benchmark	Results/Analysis	Action Taken
1. Improve the effectiveness of environmental scientists and managers in their efforts to protect the public health and welfare with respect to environmental pollution.	Program Coordinator	Working closely with graduating students and employers to determine the needed skills for the profession	Selected topics in ES 614, ES 660 and ES 630, with overlay among the courses on critical areas.	Based on responses to the specific topics, students are obtaining the needed education in the critical areas. Also validated by Comprehensive project presentations.	None.
2. Provide a forum for trained professionals to exchange information regarding protection of the environment	Program Coordinator	Have full time and adjunct faculty that stay current in the field and maintain a relationship with other practitioners	Class presentations required in several core courses.	Based on the instructor and peer evaluation of a variety of presentations more foundation is needed for the full-time students.	Incorporation of more explicit instructions and examples prior to presentations.
3. Provide the community with information, resources and trained professionals to assist them in making effective choices in public debate and private decisions regarding the environment	Program Coordinator	Insure that students and faculty are well-rounded, well-trained, and involved	Reputation of program among professionals, policy makers, and the public	The program continues to be a major "go to" organization in the region regarding all aspects of environmental policy and science	None.

Appendix VI: Previous Summary Reports

MEMORANDUM

TO: Dr. Tony Szwilski, MA Environmental Science
FROM: Bob Edmunds, Coordinator Program Review and Assessment
DATE: July 30, 2001

SUBJECT: Annual Review of Assessment Activities

Program: MS Environmental Science

1. Thank you very much for submitting the Assessment excerpt from your five year program review. Members of the UAC have evaluated the report. I have enclosed their comments for your information
2. The System Program Review Committee strongly suggested that the assessment program be implemented immediately. In order for this office to monitor your progress, please forward a copy of your Assessment Plan to this office as soon as possible.
3. The Yearly Report of Assessment Activities for the 2000-2001 academic year is due in this office no later than October 1, 2001. I am enclosing reporting forms for your guidance. Please do not hesitate to contact me if you need assistance.

Enclosures

MEMORANDUM

TO: Dr. Tony Szwilski, Environmental Science, CITE
FROM: Bob Edmunds, Coordinator for Program Review and Assessment
DATE: July 31, 2002

SUBJECT: Assessment Plan Review: MS Environmental Science

1. Thank you very much for submitting the assessment plan for the MS Environmental Science program. The plan has been reviewed by a member of the University Assessment Committee. I am enclosing a copy of the reviewer's comments. I will also be providing comments.
2. This section will document each area of the assessment plan.
 - a. Program Description: This appears to be acceptable with some editing.
 - b. Program Goals: Program goals are good, with some editing. The specific Student Academic Achievement goals do not appear to be measurable competencies students should have as they finish the program. How do you measure "increase the effectiveness that students have on the job" in the program setting. Please review these goals and restate them in terms of measurable competencies. It seems that the Curriculum development, faculty development and overall program goals are satisfactory, except for the last one. I'm not sure this is appropriate to be stated in this manner, even though that's what you mean.
 - c. Strategies for Achieving Program Goals and Learning Outcomes: I agree with the reviewer in this case. More data collection and analysis of student performance in the program should be used as well. Will you be able to provide for all of the outside input and how will this information be used?
 - d. In your report for October 1, 2002, please include a chart with your outcomes and what you have done this year in terms of measuring those objectives. One is included with this memorandum. What types of measures will be used during the program to determine student academic achievement while matriculating. You have provided entrance exams, exit surveys, employer surveys, and outside evaluation; but you have not provided any measures to indicate student competencies and academic achievement while in the program. Please review this section carefully and determine which measures will be effective. Another device which will be helpful is to do a course/objectives matrix and discover which courses measure student academic achievement in terms of the objectives. If you would like help on this, please let me know.
 - e. Data Analysis and Interpretation: Set some realistic specific time-frames for data collection and data analysis and implementation of improvements. Generally a 2 year time frame for graduate programs is sufficient.
3. You do not have to submit a revised plan at this time. Please reevaluate the specific student outcomes and rephrase them in terms of specific competencies students should have as they graduate from your program. This document should be submitted with your Yearly Report of Assessment Activities which is due October 1, 2002.
4. A cursory review of your Annual report indicates that you have begun to implement your

assessment plan. In terms of course effectiveness, the information is very general at this point. You should begin to develop patterns of evidence which document student academic achievement in terms the goals you have set and then have results, analysis, and action taken or proposed.

5. 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 should begin 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. **It appears from an analysis of your yearly assessment report that the Environmental Science program scores a level 1 in each of the areas.**

Enclosures

To: Tony Szwilski, Chair, Division of Applied Science and Technology
 From: Bob Edmunds, Coordinator for Program Review and Assessment
 Date: July 6, 2005

Yearly Assessment Report for: MS Environmental Science

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.

Yearly Assessment Report Critique	
I. a. Program goals:	Program goals were identified and articulated.
b. Learning outcomes and data collection:	Learning outcomes were listed, but they do not particularly relate to student behaviors. No data collection is in evidence.
c. Results:	The results are generally stated, but no specific evidence is presented. Action taken is no specific.
II. BOT Initiative #3:	Not applicable to graduate programs
III. Plans for current year:	Continue to work with assessment tools and the plan.
IV. Assistance needed:	Classroom space.
V. Lessons learned:	Assessment serves to monitor the relevance and marketability of the ES program.

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 presented. As stated the student outcomes are not measurable. The program should identify specific competencies for its students. The results are general with no evidence of specific data being collected. The action taken is general and doesn’t reflect the analysis of data.

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.

Scores:				
Categories	Scores			
	2000-2001	2001-2002	2002-2003	2003-2004
I. Learning Outcomes		1	2	2
II. Assessment Measures		2	2	3

III. Feedback Loop		1	1	2
Total Overall Score:		3.7	4	7
Level of Implementation (efficacy of assessment)	Assessment Plan Presented	1	2	3

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

Interpretation:

The reviewers had mixed interpretations of the information presented. On the one hand, it appears that an assessment program is in place and that assessment activities are being conducted; on the other hand, no specific data have been collected and presented. The program doesn't appear to be assessing student academic achievement for any competencies. The feedback loop is not complete.

Recommendations:

The program needs to identify student competencies (outcomes) and specifically measure them. Without data on student performance in classes, the program cannot show that it is improving the program.

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