UCC Program Review Committee summary of review

Program – Environmental Engineering Technology

This program includes the following degrees, minors, and certificates:

- Associates of Applied Science in Environmental Engineering Technology (EVT)

Recommendation

This program is found to be viable, see the report for commendations, concerns, and recommendations.

Date of last review – AY 2006

Date of this review – Spring 2015

This review has been sent to program chair and the dean. The chair provided some corrections which have been applied. The dean provided some comments which are attached.
Environmental Engineering Technology (EVT)
Chillicothe Campus
Seven-Year Review

I) Executive Summary –

Environmental Engineering Technology (EVT) is an Associate in Applied Science (AAS) degree program with growth potential, but it is presently in a stagnant state. A recent decline in the number of graduates from the program could be linked to many factors that will be discussed throughout this report. Efforts to rejuvenate the program through the use of Interactive TV, correspondence courses and the potential for college credit plus may assist the program in revitalizing the enrollment trends anticipated when it was first implemented in September 1998.

II) Program Review

General Program Summary

The general purpose of the EVT program is to provide students with the theoretical and practical background required to pursue careers in environmental engineering technology. Special emphasis is placed on environmental sampling, monitoring and remediation through the use of environmental instrumentation used by field professionals.

Since its inception in 1998, the Environmental Engineering Technology program has been reviewed twice – in 2002 and 2006.

In the last seven years, the program has experienced an increase in the number of adjuncts teaching courses for degree completion. This is primarily due to the fact that the only Group I faculty assigned to this program (who is also the program coordinator) has served in numerous other capacities since AY 2003. These assignments have included serving as OUC Associate Dean twice, completing a special assignment in Ohio University’s eLearning Office, and most recently serving as OUC Division Chair. During this period, the program coordinator requested a leave of absence for two years in order to pursue a doctoral degree in mathematics education.

At present there are efforts to increase student enrollment and program completion. With the exception of a peak in AY2012, the number of graduates has ranged from 0-3, with the program graduating two students in 2013 and two graduates in 2014. The number of students enrolled during this same time frame ranged between 8 and 12 per year. An examination of course and program completion statistics offers insight into some of the issues encountered since the last program review. Approximately 27% of students successfully complete the required mathematics course (Survey of Calculus) compared with nearly 87% of students who are able to successfully complete the core EVT courses. As a result, the overall EVT program completion rate is 26.9%.

Faculty Profile

The EVT faculty consists of one full time Group I faculty who also serves as the program coordinator. Over the last 7 years this faculty member has also served in numerous administrative positions within the campus and university and also has taken a two-year leave of absence to work on his PhD in Mathematics Education. Two OUC faculty members (Group I - Law Enforcement Technology and Group II - Geography) have also taught in the program. A
total of 11 adjunct faculty from a variety of specializations have also taught in this program. A review of the vitas and credentials of these adjuncts indicates that they bring extensive experience from the field to the classroom.

Plans are underway to expand the EVT program in 2015-2016 to Ohio University Southern (OUS). In order for this expansion to be successful, the program will need to conduct a comprehensive evaluation of the availability of current faculty to teach courses at another regional site. Since many of the current adjuncts are employed full-time in the industry, expanding their teaching responsibilities to another location may have implications for the current program at OUC.

In addition, there appear to be unanswered questions with regard to the role that current OUS faculty will have in the proposed expansion of the EVT program, as well as who will assume primary responsibility for overall program coordination and course scheduling between the two campuses. These are details that need to be analyzed and discussed to ensure the continuation of the program at OUC and the effective expansion potential at OUS.

Programmatic Practices

Faculty and administration are concerned about the low number of graduates in the current EVT program. In discussions with faculty and administration, numerous factors that could potentially account for the lower enrollments were identified. These include:

- A higher level of math and science skills/knowledge required for the program
- Ability for students to secure employment in the field without degree completion – some are recruited after successfully taking a few of the courses
- Extensive amount of time that the Group I coordinator devotes on administrative duties not directly related to the EVT program.

Recent attempts have been made by faculty and administration to address the small number of students who graduate from this program. One strategy involved the creation of a print-based curriculum to provide students with the option of completing EVT courses via correspondence. These courses have increased enrollment in the program through marketing efforts to incarcerated students and military personnel. However, a primary concern is that these students will receive lucrative job offers without completing the degree based on the valuable industry knowledge that can be acquired through the completion of some of the core courses.

Another tactic has involved enhancing the tutoring and course delivery for the required math class to enhance the ability of students to successfully complete the calculus required for the major. While working on his PhD in Mathematics Education, the Group I coordinator developed a self-paced learning approach to support the EVT’s program need to assist students with insufficient math and science skills. This program, called the Collaboratory Approach, has received financial support in the form of grants. In addition, the Group I coordinator has been invited to deliver a number of presentations on the ability of this approach to improve student course completion (and ultimately EVT program completion). During spring 2015, the Group I coordinator decided to relieve himself of most of his other administrative duties. As a result, he should have more time to devote to focusing on the revitalization of the EVT program.

Curriculum
During the period of this self-study, the EVT program made the transition from quarters to semesters at Ohio University. Below is the current EVT semester curriculum:

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Third Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVT 1000 Introduction to Environmental Engineering</td>
<td>EVT 2000 Site Investigation</td>
</tr>
<tr>
<td>EVT 1100 Environmental Engineering Instrumental</td>
<td>EVT 2000 L Site Investigation Lab</td>
</tr>
<tr>
<td>Eng 1510 Writing and Rhetoric</td>
<td>EVT 2100 Intro to Health Physics</td>
</tr>
<tr>
<td>Chem 1510 (or Chem 1210) Chemistry I</td>
<td>EVT 2400 Air Sampling</td>
</tr>
<tr>
<td>Psy 1110 or Math 2500 Statistics 03/04</td>
<td>EVT 2400L Air Sampling Lab 01</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16/17</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Fourth Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVT 1200 Intro to Environmental Chemistry</td>
<td>EVT 2200 Fluid Dynamics</td>
</tr>
<tr>
<td>EVT 1250 Env. Engineering Applications</td>
<td>EV 2500 Analysis of Environmental Pollutants</td>
</tr>
<tr>
<td>EVT 1400 Air and Waste Water Pollution</td>
<td>EV 2500L Analysis of Environmental Pollutants Lab</td>
</tr>
<tr>
<td>Math 1350 Survey of Calculus</td>
<td>COMS 1030 Fund. Of Public Speaking</td>
</tr>
<tr>
<td>Chem 1520 or 1210 Chemistry II 04</td>
<td>Tier II Equivalent 03</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

**Teaching**

Currently, faculty and administration have turned their focus to increasing the number of students that enroll and successfully complete the EVT program. The creation of the print-based correspondence course option is one strategy to increase enrollment to include students in the military and in prison. While this may increase the number of students taking EVT courses, a primary concern is that this will result in increased degree completion. In addition, all of the supplemental courses are not offered through correspondence.

One noteworthy aspect of the industry and the level of preparation offered by current EVT courses is the fact that students who complete core courses are often able to meet the minimal qualifications for entry-level jobs in the field. This points to the potential for developing certificate programs that provide current students and those who are already working in the industry with the opportunity for continuing education or opportunities for specialization.

Expansion of the program to the Southern campus is another attempt to increase student enrollment. Classes are slated to begin in Fall 2015, but as of this review there were no classes
that appear on the Interactive Schedule of Classes. The initial proposal indicated that courses would be offered to OUS students by Chillicothe faculty (Group I and adjunct). A primary area of concern is the ability to effectively conduct labs that are essential to providing students with field experience based on the limited resources (faculty, money and labs) available at OUS to support the program.

Another potential area for consideration is the potential for EVT students to the two-year program and matriculate to the 2+2 program with the B.S. in Environmental Health and Occupational Health and Safety offered on the Athens campus.

At present there is a draft of program learning outcomes that are aligned with the Accreditation Board for Engineering and Technology (ABET) and Engineering Technology Commission (ETAC) accreditation. Additional work is required to clearly outline how these learning outcomes will be measured.

Research

The Group I faculty member assigned to this program has numerous publications that focus on applied research and activities. These included numerous works related to environmental engineering. His research appears to be appropriate for a Group I faculty member.

More recently a deliberate shift in his research efforts focused on improving the STEM courses that support the EVT program need to assist students with insufficient math and science requisites. This research is the product of the Group I faculty member’s PhD dissertation research in the Collaboratory Approach to mathematics instruction. This research also seems appropriate for faculty working in this program.

Students

During this review, the committee interviewed present EVT students. Both spoke highly of the faculty (full time and adjunct) and stated that faculty offered a wealth of practical experiences that brought program knowledge to life. Both students who participated in the program interview will graduate in May 2015 and indicated that the program prepared them for competitive career opportunities. One student indicated that he will pursue an internship with a local company and the other plans to relocate to Athens and complete a bachelor’s degree in one of the Environmental Engineering programs.

An area of concern expressed by students focused on the outdated equipment in the labs. They recommended that the lab facilities be updated to provide students with experience working with the tools they will encounter in current careers. In addition, students expressed concern regarding the need to teach most classes at night in order to accommodate the adjunct faculty’s work schedules. Night classes severely limit the opportunity to experience lab work that needs to be conducted in the daylight hours.

Adequacy of Resources

Currently the program has adequate lab resources that need updated equipment and materials. The number of faculty assigned to teach in the program seems adequate as long as the director is relieved of some of his other administrative duties. Doing so will enable him to devote additional attention to recruitment of students and to secure physical resources needed to
enhance laboratory facilities. Hiring adjunct faculty who could teach during the daytime would strengthen the program and offer flexibility in course offerings. A primary concern with the proposed expansion of the program to the Southern campus is the availability of faculty resources and physical (lab) resources to support curriculum requirements for the program without taxing the present Chillicothe faculty.

Comment on Required Questions

- **Is the current number and distribution of faculty sufficient to carry out the broad overall mission of the Department?**

For the last seven years the Program Coordinator has assumed various administrative duties and devoted time to pursue a PhD in Mathematics. During this time, several courses were taught primarily by adjuncts. It does not appear as though the program has had a sufficient full-time faculty to address the ongoing needs of the program. This is one possible reason for the decrease in the number of EVT graduates/majors in recent years. Recently the EVT Program Coordinator has completed unrelated administrative duties, and he should have sufficient time to effectively address the needs of the Chillicothe program. Additional full-time and adjuncts will be needed if the program plans to expand to the Southern campus.

- **Is the level of the Department’s RSCA appropriate for the program given the size of the faculty and the resources available to the Department? Is the Department’s level of external funding at an appropriate level?**

The Department’s RSCA does seem appropriate at this time. Even though there is no external funding to support the program, there is strong potential to form partnerships with local business and industry to provide essential resources.

- **Is the level of service, outside of teaching, appropriate for the program given its size and role that it plays in the University and broader communities it interacts with? Is the Department able to fulfill its service mission?**

Currently the EVT program has no problem fulfilling its service mission. The question is whether the faculty’s level of service has interfered with the continued development of this program.

- **Does the Department have an appropriate level of financial resources, staff, physical facilities, library resources, and technology to fulfill its mission?**

At this time the Chillicothe program has adequate classroom and lab space. Additional resources would be helpful to update the lab equipment. These renovations would greatly enhance the overall quality of this program. Expansion to OUS requires additional financial, physical, and personnel resources. Currently OUC has a mobile lab used for EVT courses, but there are some questions as to whether this will adequately meet the needs of a program being offered in its entirety on the Southern Campus.

The program seems to have adequate library resources and technology to fulfill its mission.

- **Is the Department fulfilling its service role, adequately preparing nonmajors for future coursework and/or satisfying the needs for general education?**
The Collaboratory Project, which the EVT Program Coordinator is developing as part of his PhD research, is a resource to assist students who are having difficulties in math and science courses.

- **Is the program attracting majors likely to succeed in the program? Is the number of majors appropriate for the program? Is the program attracting a diverse group of students?**

The number of EVT students graduating from the program is currently small (two graduates in each of the last two years). A number of the students who begin the program either drop out because of the difficult course requirements (e.g., calculus and physics) or they secure jobs before degree completion. The Collaboratory is an effort to improve program completion and the print-based programs are an attempt to reach more diverse students.

- **Does the undergraduate curriculum provide majors with an adequate background to pursue discipline-related majors with an adequate background to pursue discipline-related careers following graduation?**

EVT graduates are securing jobs or transitioning to complete four-year degree programs that provide skills and knowledge in the appropriate career.

1) **Commendations**
   - Mike Lafreniere’s leadership
   - Mike Lafreniere’s support of students. This is especially demonstrated in his willingness to design math classes to meet the diverse needs of students.
   - Network of professional connections to contribute to adjunct pool and internship opportunities for students.
   - High level of expertise and demonstrated commitment by adjunct faculty.
   - Student/adjunct relationships
   - Collaborative learning
   - Potential to meet diverse industry and economic needs of the area
   - Willingness to expand program into other platforms to meet needs of students that would have barriers to career options.
   - Hands on training that the students are able to secure with the course offering (field work, labs)
   - Mobile resource units that are able to expand the program into other markets

2) **Concerns**
   - Lack of defined leadership and long term documented strategic vision
   - Small number of graduates
   - Lack of marketing and promotion of the program
   - Expansion of the program to Southern without a strategic plan that factors in the existing program needs
   - Courses at OUS are to be taught by existing OUC adjuncts
   - The number of courses taught by adjuncts and it is not clear if the adjuncts have been consulted to determine their availability and willingness to teach at OUS.
   - Need to update equipment (as communicated by adjuncts and students)
   - Lack of an active advisory board
• Students opt out of program before degree completion because students are marketable before completing degree.

3) Recommendations

• Clear leadership plan for Chillicothe and RHE coordination
• Creation of a strategic plan for The Chillicothe program
• Establish benchmarks to project additional full time resources
• Create and fund a marketing plan for the Chillicothe program
• Develop a training and evaluation plan for adjuncts
• Explore accreditation through Accreditation Board for Engineering and Technology (ABET)
• Establish an advisory board that meets on a regular basis
• Develop measure-able outcomes for all courses
• Review the student demographics and modify course schedule and resources to match changing students needs
• Explore opportunities for partnerships with community to market program
• Secure internships, jobs and hands on learning opportunities.
• Work with local high schools and technical centers to offer CC+ options to promote and offer the degree.
• Review the curriculum industry credentials that could be obtained through CEU or coursework
• Explore options for completion of pathways to degree completion via stackable certificates for industry credentials.
• Regular meetings with all EVT faculty to engage faculty commitment and involvement in program growth
• Promote umbrella 4-year degree options (BTAS, occupational Heath, BSS, BSAM) to encourage students to pursue 2+2 opportunities.
• Ongoing open communication between faculty and administration, to discuss the long-term vision and strategic planning.
• Showcase and promote the accomplishments of graduate’s
• Periodically, incorporate special topics courses that address special Contemporary topics. This would be to enhance students’ marketability.

III) Reviewers

Dr. Candice Thomas Maddox, Associate Professor of Communications, Lancaster Campus
Dr. Warren Galbreath, Associate Professor of Social Work, Eastern Campus

IV) External Review Letter

There was no External Reviewer for this review.
September 23, 2015

Dr. David Ingram
Chair, Program Review Committee
University Curriculum Council (UCC)

Dear David:

Thank you for sending the draft of the program review document for the Environmental Engineering Technology (EVT) Program offered on the Ohio University Chillicothe (OU-C) campus, and the opportunity to respond to the review. As you know completion of this two year degree program leads to an Associate in Applied Science degree. I also would like to thank Drs. Candice Thomas Maddox and Warren Galbreath, the program reviewers who reviewed the program Self Study and conducted the site visit to the Ohio University Chillicothe campus. I greatly appreciate such a complete and thorough review of the program.

I would very much agree with the review that the EVT program is “viable” mainly based on the excellent advising and “up to date” quality of instruction students receive in the program from Mr. Mike Lafreniere, the program coordinator, and the several practitioners who serve as the adjunct faculty for the program. However, for the long term, I am very concerned regarding the low student enrollment of the program, which has maintained over the last several years, and feel this critical issue should be addressed immediately to insure the future viability of the program.

I have recently had a discussion with Mr. Lafreniere regarding how the enrollment of the program can be increased. Mike has some excellent ideas related to strategies which could be implemented to boast enrollment. These strategies include more aggressive recruitment and marketing of the program, promotion of the “print based” program option, offering the EVT courses required to complete the degree in on line and/or blended (hybrid) formats and developing 2+2 articulation agreements with similar programs (Environmental Health and Occupational Health) within the Ohio University College of Health Sciences and Professions and Shawnee State University which would result in baccalaureate degrees. The recent expansion of the EVT program to the Ohio University Southern Campus should also result in future increased enrollment of the program. Now that Mike has fulfilled his administrative responsibilities to the Chillicothe campus and e-Learning, I feel confident he will have the time to adequately
address the issues of the program and develop a Strategic Plan to guide its future growth and development.

While a strength of the program has been the highly qualified practitioner adjunct faculty who teach in the program, I feel strongly that more of the courses, particularly in the introduction/survey area of the program should be instructed by permanent faculty on the campus. I feel this is important to provide consistency in the delivery of the curriculum. In the future, I will work with the campus Associate Dean to schedule more EVT courses with permanent (group I and II) faculty, in particular Associate Professor Lafreniere, now that he is free of his administrative duties.

In my study of the review document, I was surprised and concerned to learn of the large percentage of students who leave the program to pursue jobs in the field before finishing their degrees, and students that drop out of the program because of difficulty completing the Calculus requirement. While it is difficult to prevent a student from leaving the program to accept a lucrative job, offering the EVT courses required to complete the program in an on line or blended format may help encourage these students to continue in their studies and complete their degree after they have accepted a position in the field.

With regards to the Calculus requirement, it is my understanding from speaking with Mr. Lafreniere the program curriculum included this requirement in anticipation of seeking ABET accreditation for the program, and a lack of calculus knowledge does not disadvantage the students in obtaining employment or excelling in the field. While I would admit obtaining ABET accreditation would significantly increase the program’s stature, results show the requirement has a significant negative effect on the number of students who complete the program; as only 27% of the students declaring the major during the review period were capable of completing the requirement. The fact that the program has a low enrollment of students to begin with; the loss of a quarter of the students being unable to complete the Calculus math requirement is obviously having a significant negative effect on the graduation rate of the program. As a result, I feel the requirement should be reconsidered as part of the curriculum and possibly lower the program math requirement to a pre-calculus course.

From a facilities/physical resources standpoint to offer the program, I was also surprised to learn of the concerns that some of the equipment used in offering the EVT courses was considered by the students and the adjunct faculty as “out of date”. I was unaware of the severity of these needs. While budget reductions and the implementation of Responsibility Centered Management (RCM) has resulted in significant cuts to the campus’ operating budget, funds have been available to replace many of the equipment items that need to be replaced. In addition, a recent strategic priority of the campus is to revitalize the seven acre Emergency Response Training Center (ERTC) located on the OU-C campus to be used for continuing education and workforce development activities in the OU-C service region. The ERTC is also used as a training ground for EVT students/courses. The ERTC has come under disrepair in recent years due to a lack of attention to its upkeep. As part of the revitalization efforts, facilities associated with the ERTC are currently being renovated and new equipment is being
purchased. This equipment will be used for the continuing education/workforce development efforts of the campus but also will be available for the curricular offerings of the EVT program.

In conclusion, I very much appreciate the efforts of the program reviewers to assess the Environmental Engineering Technology degree programs offered on the Chillicothe campus and the opportunity to respond to their findings and recommendations. This process will be invaluable to the program as it plans for the future.

Please do not hesitate in contacting me with questions or concerns.

Sincerely,

[Signature]

Martin T. Tuck PhD
Dean
Ohio University Chillicothe
tuck@ohio.edu
740-774-7222