UCC Program Review Committee summary of review

Program – Department of Civil Engineering

This program includes the following degrees and certificates:

- B.S. in Civil Engineering
- M.S. in Civil Engineering
- Ph.D. in Civil Engineering

Recommendation

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

Comments – non-binding

This review was one of several to use the program’s accreditation process as part of the review, in this case only for the undergraduate program.

The next review may be timed to coincide with the accreditation of the undergraduate program in order to reuse some self-study materials, but, there should be a site visit involving internal and external reviewers.

Date of last review – AY 2006

Date of this review – March 2014

This review has been sent to program chair, he has no comment.

This review has been sent to program college dean, he has no comment.

This review has been sent to graduate council, they have no comment.
University Curriculum Council  
Academic Program Review Committee  
September 9, 2014  

Undergraduate Civil Engineering Program  
Russ College of Engineering and Technology  
Seven-Year Review  
2004 – 2011  

Executive Summary  

The undergraduate Civil Engineering (CE) Program is a viable program that plays a substantial role in the University’s overall mission. Graduates of the CE undergraduate program earn a Bachelor of Science degree. The CE program was first accredited by the Engineering Council for Professional Development in 1952 and has maintained accreditation continuously since that time. The accreditation organization is now named ABET. ABET Actions for the 2010-11 Accreditation Cycle indicate that the CE Program is accredited until September 30, 2017. There are eight areas of specialization within the CE program: Construction Management, Environmental, Geotechnical, Pavement, Structures, Surveying, Transportation and Water Resources.  

Commendations  

The Civil Engineering Undergraduate Program is to be commended for the following:  

• Faculty engagement in publication and funded research. The body of work contributed by faculty members is strength for this program.  
• Interdisciplinary work is valued and the report shows evidence of collaboration across sub-discipline areas including Environmental, Geotechnical, Structure, Transportation, Construction Management and Water Resources. The majority of interdisciplinary collaboration was supported through research funding from the Ohio Research Institute for Transportation and the Environment (ORITE), faculty advising of graduate student theses and dissertations, and faculty authoring scholarly documents.
• Collaboration with colleges and schools across the university and three projects were highlighted in the self-study as exemplars.
  - A project with the Chemistry Department titled “Exfiltration Trenches for Post Construction Storm Water Management for Linear Transportation Systems” was conducted with funding from ODOT/FHWA.
  - A project with the College of Education titled “The Boat of Knowledge in the Science Classroom” sponsored by the National Science Foundation.
  - A project with Psychology, Industrial and Systems Engineering Department and School of Communication Sciences and Disorders titled “Acquisition of a Synergistic Driving Simulator” sponsored by the National Science Foundation.

Concerns and Recommendations

No concerns or recommendations were identified as a result of the review of the CE program Seven-Year Self Study materials.

Program Review

The undergraduate Civil Engineering (CE) Program is a viable program. The CE program has maintained accreditation since 1952 and the ABET Accreditation Actions for the 2010-11 Accreditation Cycle indicate that the CE Program is accredited until September 30, 2017. According to the Seven-Year Self Study, the CE undergraduate program continues with eight areas of specialization: Construction Management, Environmental, Geotechnical, Pavement, Structures, Surveying, Transportation and Water Resources.

Faculty Profile

Number of Faculty and Changes in Faculty Composition: The CE program has 14 FTE Group 1 faculty positions that include the chair of the department. Two positions were unfilled at the time the CE self-study was written: one faculty member accepted a position at another university and one faculty member retired. The reported faculty distribution included 5 Professors, 4 Associate Professors, and 3 Assistant Professors. The department was awaiting approval to begin a search to fill the two vacant group 1 positions.
The faculty competencies reported in the self-study include Construction Engineering (2), Geotechnical and Materials (4), Environmental and Hydraulics/Hydrology (4), Structural (2), and Transportation (2).

**Faculty Diversity:** Evidence of faculty diversity is provided in the report.

**Programmatic Practices**

**Teaching and Advising:** The teaching load of each faculty member is represented in the ABET Self Study Report Section 6C, Section 6E and on Table 6-1, all of which are included in the self-study. Each faculty member’s time spent on teaching, scholarship and research, and service is clearly described. Individual faculty development plans are included in Section 6G.

Individual advising of students averages 15-20 CE undergraduate students per faculty member. Faculty members also advise student organizations such as ASCE and Chi Epsilon. Faculty additionally advise student groups in state, regional and national competitions such as the Waste Management Education and Research Consortium (WERC), Flexible Pavement of Ohio’s Asphalt Mix and Ohio Construction Association (OCA) bidding competitions.

**Research, Scholarship and Creative Activity**

All department faculty members are currently engaged in research, scholarship and creative activity. The self-study report states that refereed publications have been steadily increasing the past several academic years. In a review of curriculum vitae, every faculty member documented multiple refereed publications in the last five years.

The self-study reported 72% of faculty members have received external and/or internal funding for research and scholarly activities over the seven-year period. Research and scholarly efforts were well documented in the self-study Appendices. External support during the review period was reported as determined from the LEO database reports for each fiscal year with an annual average of $1.67 million. It is apparent from the review that all faculty members are engaged and quite productive.
CE faculty members reported involvement in interdisciplinary work within the department, within Russ College and across the university. Collaborations reported include Environmental, Geotechnical, Structures, Transportation, Construction Management, and Water Resources. The collaboration is primarily sponsored by funded research from the Ohio Research Institute for Transportation and the Environment (ORITE), faculty members advising graduate student theses/dissertations, and authoring scholarly documents. Current within the college collaborations reported include research and/or graduate student advising with Industrial and Systems Engineering, Engineering Technology and Management, Electrical Engineering and Computer Science, and Mechanical Engineering. Current collaborations reported across the university include research with the Chemistry Department, Education, and Psychology.

**Resources**

Physical Facilities and Technology: At the time of the report, a total of 16 offices in Stocker Center were dedicated to full and part-time faculty. The department considers this space adequate and further described other physical space used for other office needs. Classroom space for undergraduate courses was reported as housed in the Academic and Research Center (ARC), adjacent and connected to Stocker Center. The self-study stated that the Russ College has first priority to schedule classes in Stocker Center and ARC, and that most classroom needs are met there. Laboratories include both computer labs and specialized labs in Stocker Center. Students use the specialized labs to learn the use of modern engineering tools. CE reported specialized labs for environmental, fluids, soils/strength, CE materials and surveying. CE reports their lab spaces as being adequate to fulfill their teaching mission. There is a five-year plan in place to acquire, maintain and replace lab equipment needed for each of the labs.

**Undergraduate Program Review**

The curriculum plan of study is clearly articulated in the self-study as part of the embedded ABET accreditation document. The program was described as
requiring 195 credits (quarter hours). The program builds upon a foundation in the basic sciences and mathematics (minimum of 53 quarter hours) and engineering courses (minimum of 112 quarter hours) to help students develop the ability to think logically, and to apply knowledge gained to the design and synthesis of complex civil engineering projects.

**Closing Summary**

The Civil Engineering Program Seven Year Review Self Study Report documents a successful, viable program. All requested elements of the report were included and aided in review of the program.
University Curriculum Council
Academic Program Review Committee

11-12 March 2014

Review of Civil Engineering, MS

Robert L. Mullen & Scott Sparks, Reviewers

Recommendation: Viable

This review is based on a visit to the Russ College of Engineering and Technology on March 11 and 12th 2014. The review team met with the senior leadership of the department (Department Chair Prof. McAvoy and Graduate Director Prof. Sargand), Dean Irwin, graduate students from the College, tenured faculty, and probationary faculty. We also toured several laboratories in the college. In addition, the program self-assessments were read and data extracted from these reports.

Faculty Profile

Current faculty size and distribution

Total of 12 faculty: Professors 5, Associate Professor 4, and Assistant Professor 3. (Page 2 and page 31 of the self-assessment report have slight differences in the distribution and I assume that they were taken at slightly different times.)

The distribution of rank is reasonable. For the scope of the program and the future planned increases in graduate enrollments, an additional hire may be considered in the future.

Research, Scholarship, and Creative Activity

Current Department RSCA

For the masters program, I believe the total of the presentations, journal papers, and conference proceedings of 5 per faculty per year are appropriate for the size of the masters program.

External funding

The external funding is acceptable at 140k/total faculty/year

Resources (financial, space, personnel)

I did not hear from the constituents significant concerns about financial resources. I find the unusually for faculty which I interpreted that most of the financial need of the graduate program are being satisfied.

Educational Quality

Students
The program is successful in bringing both domestic and international graduate students. There are pipelines developed with several international institutions and more are planned in the future.

*Faculty Diversity*

The faculty gender diversity of 17% female is within the expected range (23%) for Civil Engineering programs. The faculty consists of both native born and international faculty in typical proportions for Civil Engineering faculty. A future hire from an underrepresented group would improve the diversity of the depart

*Curriculum*

The curriculum described in the self-study is appropriate for a MS program in Civil Engineering. The ability for the student to specialize in a focus area of Civil Engineering is provided as part of the program. The core courses are appropriate for the focus areas offered. The overall number of courses listed (over 60) for a graduate faculty of 12 people would make it difficult to offer all courses during a student’s tenure at the college for a MS degree.

*Mentoring and advising of students*

From the student comments on the program, there was sufficient mentoring and advising of the students in the program.

*Financial Support of graduate students*

The MS student stipend seems a little low at 18k/year. A hire amount may improve the recruitment of students.

*Teaching assessment*

Did not review teaching evaluations, and there were only positive statements from students.

*Post graduation career placement*

Placement of students reported in self-study indicates that there is a demand for graduates that is greater than the current production rate. Students should be able to gain employment in the profession after graduation.

*Areas of Improvement*

There is significant good will developed by senior faculty at governmental research agencies that needs to be institutionalized with the more junior faculty to ensure long terms success of the program.

May not be a formal method for mentoring of junior faculty.

Unbalanced distribution of PhD student advisor demand towards senior faculty members.

*Recommendations*
Commendations

The MS students that I met during the visit were knowledgeable and enthusiastic about their research. In addition, they had a good understanding of how the work they were doing fit in the over-all research activities of the profession. They also had a well-defined vision of their future career paths based on a critical review of their options.

The “female alumni group” meetings are an innovative way to increase the gender gap in Civil Engineering.

Overall judgment: the program is viable.
Civil Engineering, PhD

Robert L. Mullen & Scott Sparks, Reviewers

This review is based on a visit to the Russ College of Engineering and Technology on March 11 and 12th 2014. The review team met with the senior leadership of the department (Department Chair Prof. McAvoy and Graduate Director Prof. Sargand), Dean Irwin, graduate students from the College, tenured faculty, and probationary faculty. We also toured several laboratories in the college.

(Most of the comments on the MS program also apply to the PhD program. I have only included statements that are different for the PhD program)

Faculty Profile

Current faculty size and distribution

There are 12 faculty and rank is appropriately spread out. The teaching load of 4 courses per year for a faculty member who has 5 PhD students is high.

Research, Scholarship, and Creative Activity

Current Department RSCA

The number of journal papers per faculty is a little low (around 1.5) and not as uniformly distributed for a growing PhD Program.

External funding

Acceptable

Resources (financial, space, personnel)

The department reports adequate resources

Educational Quality

Students

There are active recruitment efforts to improve domestic applications in the department.

Requested help from college to recruit grad students.

Faculty Diversity

There is an active effort to increase diversity in the graduate student population and a particular focus is on increasing female student population. The program has a large international student body.
Curriculum

The PhD program includes a good mix of course work and independent research. The exams as part of the degree program provide quality control of the program as well as identifying student weaknesses so they may be addressed. The requirement of a MS before entering the PhD program may lengthen the time for a student who is committed to a PhD to achieve his/her goal. This is a matter the department may want to consider in the future.

Mentoring and advising of students

In faculty interviews it was revealed that mentors are assigned to students particularly students who are struggling.

Financial Support of graduate students

PhD student stipends of 20-24k per year seem low.

Teaching assessment

Course evaluation data show acceptable evaluation scores.

Post graduation career placement

A strength is a strong job market. It is reported that program graduates have little difficulty obtaining the jobs they wanted.

Areas of Improvement

None

Recommendations

- A collection of best practices as well as a brain storming session on methods to improve graduate student recruiting would be useful for the College to conduct.

Commendations

The department is very student focused. Appropriate supports are available to students

Overall judgment: the program is viable.