Graduate Program Review
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Department of Civil and Environmental Engineering

Review Committee: Jacob Najjar, Walt Oler, Edward Quitevis, Thomas Thompson (chair)

Overall Comments:

The Department of Civil and Environmental Engineering (CEE) at Texas Tech University is located in the College of Engineering. The department currently has 19 faculty, with two open faculty positions. The department has seven professors, six associate professors, and six assistant professors. The department also employs nine non tenure-track faculty (adjuncts and instructors) to teach undergraduate courses. Funds from empty faculty lines have been used to pay these individuals. Dr. Scott Norville has been Department Chair since 2003. In addition to studying the review material, the review committee spent approximately one day visiting with the chair, faculty, and graduate students of the department, and touring the department’s facilities. The department chair spent two hours in discussion with the committee and led the facilities tour. Two hours were spent in discussion with the faculty in the absence of the chair. A total of 17 faculty participated in the discussion. The committee also visited for two hours with about 15 of the department’s graduate students.

The committee was favorably impressed with the department. The degree of faculty participation in the review and the apparent good rapport among new and experienced faculty was impressive. They are active in grantsmanship and teaching. The faculty expressed confidence in the chair, and the faculty seem to be generally unified. Faculty seem to be optimistic about the future of the department and the potential for developing outstanding graduate programs. The faculty are divided into two disciplinary areas: Civil Engineering and Environmental Engineering (including Water Resources).

The committee members understand that this review is for the period 2001-2006. However, the committee members wondered why we were conducting this review during 2009. The data provided are almost two years old. This raises a question about the relevance of our recommendations. The chair also expressed some doubts about the integrity of the data provided for the review. We highly recommend that the Graduate School provide current data and schedule reviews in a timely fashion.

Program Overview and Vision
Rating: Needs Improvement

Discussions with the chair and the faculty revealed that there has been considerable thought devoted to ways to improve the department and the graduate programs. Both the chair and the faculty expressed similar goals with respect to increasing the number of faculty and the desire for more space. However, these goals are not reflected in the department strategic plan, with the exception of the stated desire to hire six more faculty members. In general, the department strategic plan is vague and lacks measurable metrics. Within the strategic plan, there is no
articulation of a clear vision for their graduate programs. Faculty want to increase the number of Ph.D. students. However, this is not reflected in the strategic plan, nor is there a plan articulated for achieving this. The committee believes that a more specific and goal-oriented strategic plan would benefit the department.

The department faculty is structurally organized around their three major research centers: Water Resources, Center for Multidisciplinary Research in Transportation (TechMRT), and the Wind Science and Engineering Research Center. This is logical considering the faculty expertise in the department. According to both the faculty and the chair, the research centers have been a net positive for the department. The directors of the three centers report to the chair as faculty, but to either the Dean of Engineering or the Vice President for Research as center directors. This creates some confusion and is less-than-optimum for administrative efficiency.

**Faculty Productivity**
Rating: Excellent

The committee members were impressed with the apparent quality and productivity of the faculty. Most of the faculty are active in research and publication. The Assistant and Associate Professors are notably active in research activities. The quality of recent faculty hires appears to be particularly good. In discussions with the committee, graduate students seem to be pleased with the quality of the teaching they received from faculty. Several faculty members have been recognized for their teaching excellence by the college, university and professional organizations.

The teaching load of faculty appears to be reasonable. The department has been trying to move toward a 2+1 teaching load (fall-spring), except for new faculty who have only a 1+1 teaching load within the first two years after arriving. The department’s operating funds per student credit hour taught have decreased by 16% since 2002. The faculty expressed the opinion that they are the “most efficient civil engineering program in the state”. These data appear to support this contention. However, more in-depth comparative analysis needs to be performed to fully validate the faculty’s opinion.

**Quality and Quantity of Graduate Students and Graduates**
Rating: Good

The review committee members were impressed with the quality of students that they met. About 15 students met with the committee. Of these, about half were domestic and half were international. Most of the department’s MS graduate students are recruited from among their undergraduate ranks. A similar situation seems to hold for their PhD students where a good number of them are recruited from among their MS graduate students. Building a more competitive program will help enhance recruiting from outside of TTU.

Both the chair and the faculty indicated the need for more TA support. Currently, the department supports 6-8 TAs. This seems low for a department with 462 undergraduate
students (as of 06/07 data). An average of one TA per faculty member will alleviate the faculty teaching load, increase the ability of the department to recruit outstanding graduate students, and free up faculty time to increase research productivity. This will also improve the quality of their undergraduate program. The faculty expressed that the chair is working toward this goal. The college and university should work with the department to develop mechanisms to fund additional TA lines for the department.

The department offers a $1,000 scholarship to graduate students not on assistant during their first semester. While this clearly brings some student to the department, faculty expressed concerns that this usually does not attract highly competitive graduate students. Students noted that this practice places a lot of pressure on them to achieve high grades during their first semester in order to secure an RA or TA position.

**Curriculum and Programs of Study**

The department currently enrolls about 85 graduate students. Three Master’s degree programs are offered: Civil Engineering (CE), Environmental Engineering (EnvE), and Environmental Technology Management (ETM). The EnvE Master’s degree is part of a 5-year (4+1) program that begins with the B.S. in Environmental Engineering. Enrollment has recently fallen in both EnvE and ETM. The department has recently moved to discontinue the ETM degree, which the committee commends. According to both the chair and the faculty, enrollment is now growing in the EnvE program and recent faculty hires have been used to support this program. The department also offers the Ph.D. in Civil Engineering. The committee feels that the CEE graduate programs are compatible with similar graduate programs in peer institutions. We have some concern that the faculty numbers are marginal for supporting four degree programs.

Graduate students overall were positive in their impressions of the programs and the department. Each of the 15 graduate students who met with the committee had praise for the faculty and indicated that they would recommend CEE to prospective graduate students. The students felt that the graduate assistantship stipends offered by the department are competitive when cost of living is considered.

Graduate students expressed concerns that some course offerings are not consistent. This presents a problem for many graduate students in order to complete their degrees on time. For example, the Advanced Steel Design course has not been offered during the past 5 semesters. The graduate students indicated that more “structural” faculty may be needed for adequate course offerings. Some graduate students also indicated that there are few elective courses available in the Water Resources area. Interest in courses on Bioremediation and Chemodynamics was expressed. Some of these problems may arise due to a conflict between the desire to reduce the faculty teaching load and the need to fulfill the course offerings required by the graduate degree programs. This may point out a need to streamline the curriculum for all graduate degree programs to achieve an optimal compromise between the
faculty teaching load and the required graduate course offerings. The committee noted that there is no graduate handbook for the department.

Both faculty and students expressed concerns about the level and quality of service from the Graduate School. Students are sometimes frustrated with excessive bureaucracy, waiting for responses, and lost paperwork. Faculty expressed similar concerns.

The graduate seminar was cancelled a few semesters ago. Both faculty and students thought this was a positive change. Previously, seminar attendance was mandated but interest was often low. Students indicated that, other than one social event per year hosted by Dr. Norville, they have few opportunities to meet each other. There is no graduate student organization within the department. Many of the students indicated that the department has supported their travel to professional meetings.

Concern was expressed by the chair and CEE Faculty about the recent “removal” of the Wind Science Ph.D. students from CEE to the Graduate School. Almost overnight, this has created the appearance of lower faculty productivity, because these students are not currently counted within the CEE department. Apparently, the process by which this has occurred was not transparent. Many faculty members were not even aware that this change had occurred. Regardless of the proper “home” for this program, the department and its leadership must be made a part of the discussion, and the discussions should be transparent.

Some graduate students in the Wind Science program expressed concern about the direction of this program and about friction among faculty in the program. It concerns the committee that graduate students are aware of and apparently involved in the politics of the wind science program.

**Facilities and Resources**

Rating: Satisfactory

There seems to be adequate office space for graduate students—all RA or TAs have office space. Space allocated to the department is adequate but need some remodeling to increase functionality. The classrooms in rooms 1 and 5 (basement) are especially in need of renovation and updating. The department is concerned about recovering the space allocated to the Engineering Technology department, especially the laboratory space.

The Civil Engineering building is in good condition overall, and substantial portions of the building have been renovated within the past 20 years. While the current space is generally adequate for department needs, room for expansion is limited. If the department is able to hire several new faculty members, space will become a critical limitation. All of the research laboratory space in the building is shared, according to need. The practice of sharing lab equipment is to be commended. Graduate students indicated that they had generally easy access to needed equipment. Facilities used for structural and geotechnical teaching labs needs to be renovated and good portion of their equipment needs to replaced or updated. Much of
this equipment is quite old. Throughout the building, laboratories appear functional but somewhat outdated.

Support staff appears to be adequate for departmental needs. The graduate students indicated that they receive very good support from both office and technical staff. The department website should be improved for better communication with the outside world.

**Major Recommendations**

- Amend the department strategic plan to reflect goals and strategies for growing the graduate programs.
- Secure resources from the college, university, or other funding mechanisms to increase the number of funded TA lines to 19.
- Evaluate the effectiveness of the $1,000 scholarships for incoming graduate students.
- Evaluate ways to streamline the curriculum to achieve an optimal compromise between the faculty teaching load and the required graduate course offerings.
- Develop a graduate student handbook. Post on the website.
- Improve the department website as a portal into the department.
- Resolve student “counting” issues related to the Wind Science program.
- The college or university should provide resources to renovate classrooms 1 and 5 in the Civil Engineering Building.