Engineering PhD: 2018-2019

Definition of Unit

Providing Department:
Engineering PhD

Department/Unit Contact:
Vahid Motevalli, PhD, PE

Mission/Vision Statement:

The PhD program is a research degree and aims to enhance research quality and external recognition. The program goal has evolved to provide increasing prospects for the students to focus on research in five specialization areas as well as opportunities to pursue interdisciplinary research involving one or more of these specializations.

Description of Program

The College of Engineering (CoE) at Tennessee Tech University (TTU) first began offering a Doctor of Philosophy in Engineering (PhD-Engr) degree in 1971. The PhD-Engr is a single, college-wide degree for all departments. However, students pursuing this degree will do so in an area of specialization, listed below, hosted by a CoE department. The college-wide program also allows students to develop an interdisciplinary research topic that cuts across one or more of these specializations.

PhD Specialization Area	Host Department
Chemical Engineering	Chemical Engineering Department (CHE)
Civil Engineering	Civil and Environmental Engr. Dept. (CEE)
Computer Science	Computer Science (CSC)
Electrical & Computer Engr.	Electrical & Computer Engineering (ECE)
Mechanical Engineering	Mechanical Engineering Department (ME)

Purpose of the PhD Program

The purpose of the PhD Program is to provide students with an opportunity for advanced studies and research in the field of engineering and computer science. As a research-based degree, the focus is on developing the independent learning skills of students in preparation for advanced-level, research-focused employment in industry or academia.

Curriculum Map: Engineering PhD

Curriculum Mapping :

Goal 1: Increase PhD Student Enrollment to a 3-Year Rolling Average of 95

Define Goal:

Increase the average enrollment to 90, based on a 3-yr rolling average.

Intended Outcomes / Objectives:

To maintain the critical mass of students needed to support the PhD program without over-stressing current faculty resources. Furthermore, the ultimate goal is for the college to confer at least 20 PhD degrees per year.

Goal 2: Increase Degrees Conferred to 20 per year

Define Goal:

Increase the average number of students completing the PhD program to 20 per year by 2020-21.

Intended Outcomes / Objectives:

Contribute to and lead the University's goal of achieving Carnegie classification Doctoral University.

Goal 3: Establish Assessment and Continuous Improvement for PhD Program

Define Goal:

In anticipation of the PhD program review taking place in 2020, continuous improvements have been planned and components implemented. Major changes to the program, including redefinition of student assessments and streamlining the process. These plans also include assessment tools, data analysis, and improvement actions.

Intended Outcomes / Objectives:

To have a streamlined and effective assessment and continuous improvement process in place for the PhD program by the end of the 2019-20 academic year.

Learning Objective 1: Depth and Breadth of Knowledge

Define Goal:

The student should demonstrate breadth of knowledge in the discipline and depth in the specific area of his/her research topic.

Intended Outcomes / Objectives:

All departments are reviewing their comprehensive examination process, which requires a demonstration of the breadth of knowledge by the student. All departments with the PhD specialization have been encouraging publication of a peer-reviewed paper to ensure meeting this goal. The ECE and CS departments have specifically required acceptance of a peer-reviewed publications prior to student dissertation defense.

Learning Objective 2: Independent Academic Work and Research

Define Goal:

The student should gain experience in doing independent academic work and research.

Intended Outcomes / Objectives:

All departments require presentation of the dissertation research topic as a part of the comprehensive examination. The proposal is presented to the PhD advisory committee and defended by the student. All departments with the PhD specialization are requiring publication of a peer-reviewed journal paper (conference paper in the case of CS) to ensure meeting this goal.

Learning Objective 3: Identify and define the research topic

Define Goal:

The student should demonstrate his/her ability to identify and define the research topic.

Intended Outcomes / Objectives:

The PhD candidacy is only achieved after the student has presented her/his dissertation research topic to the advisory committee and successfully defended it.

Learning Objective 4: Contribute to existing knowledge

Define Goal:

The research work performed by the student should contribute to the existing knowledge in the engineering field.

Intended Outcomes / Objectives:

Learning Objective 5: Communicate effectively

Define Goal:

The student should demonstrate the ability to clearly communicate complex engineering and research topics in both verbal and written format.

Intended Outcomes / Objectives:

Assessment Tool 1: 3-yr Avg PhD Enrollment

Goal/ Outcome/ Objective:

Goal 1- Increase Student Enrollment

Type of Tool:

FTE Enrollment

Frequency of Assessment:

Annually using Fall enrollmet data.

Rationale:

Three-year rolling average of number of students enrolled in the PhD program is a better indicator of trends than year-to-year data, which may be subject to fluctuations.

For FY 2018: 3-yr rolling avg PhD enrollment (2015-17 F)= 93

Assessment Tool 2: 3-yr Avg PhD Degrees Conferred

Goal/ Outcome/ Objective:
Goal 2

Type of Tool:
Graduation Rate

Frequency of Assessment:
Annually.

Rationale:
Three-year rolling average of number of students graduating per year is a better indicator of trends than year-to-year data, which may be subject to fluctuations.

Results 1. PhD Student Enrollment

Results:

3-yr rolling average of PhD enrollment for FY 2019 = 98

Attachments:
Enrollment 2000-2016

Results 2: Increase Degrees Conferred

Results:

For FY 2018: 3-yr rolling avg PhD degrees conferred = 9

Attachments:

Results 3: Assessment and Continuous Improvement Program established for PhD program

Results:

Tracking the progress of PhD students based on registration, advisor, candidacy status and funding status is available via a spreadsheet dating back to 2015-16. In addition, the CoE Graduate Committee has been reviewing the college-wide program requirements and has proposed a number of changes, which are under review. Additional data analysis and aggregation of the data is in place. In addition, the policy to ensure time to candidacy is 3 years for post MS degree and 4 years for Direct PhD students is fully enforced.