

Engineering PhD - Institutional Effectiveness Final Annual Report 2018

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Engineering PhD

Definition of Unit

Start: 07/01/2017

End: 06/30/2018

Progress:

Reporting Year:

Providing Department: Engineering PhD

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Mission:

Mission/Vision/Goal 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.

<u>PhD Option Area</u>	<u>Host Department</u>
Chemical Engineering	Chemical Engineering Department (CHE)
Civil Engineering	Civil and Environmental Engr. Department (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.

Goal 1: Increase PhD Student Enrollment to a 3-Year Rolling Average of 80

Define Goal:

Increase the average enrollment to 80, 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 the University's goal of achieving Carnegie classification Doctoral University.

Goal 3: Establish Assessment and Continuous Improvement for PhD Program

Define Goal:

As a result of, and in conjunction with the 2015 TBR Academic Audit Self-Study of the PhD Program, plans for a continuous improvement process for the CoE PhD program has been discussed and parts implemented through the college graduate committee actions. These plans include implementation of the 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 such a demonstration. All departments with the PhD specialization are considering, or have required, publication of a peer-reviewed journal paper (conference paper in the case of CS) to ensure meeting this goal.

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 considering or have required 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 achieved after the student has presented their dissertation research topic to their 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:

Students are encouraged, increasingly required, to publish journal papers (or peer-reviewed conference paper in the CS department) as a part of their degree completion requirements. Many opportunities exist for PhD students to present their research at peer-reviewed conferences, and they receive travel grant to present at these professional venues.

Learning Objective 5: Communicate effectively

Define Goal:

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

Intended Outcomes / Objectives:

Several seminar series, such as lightning round seminars, departmental seminars in addition to professional conferences provide these opportunities for the students internally and externally.

Assessment Tool 1: 3-yr Avg PhD Enrollment

Goal/ Outcome/ Objective: Goal 1- Increase Student Enrollment

Type of Tool: Annual Unit Report
Tracking Spreadsheet

Frequency of Assessment: Annually using Fall enrollment data.

Assessment Methods:

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 (2016-18 F) = 99

Assessment Tool 2: Annual PhD Degrees Conferred

Goal/ Outcome/ Objective: Goal 2

Type of Tool: Graduation Rate

Frequency of Assessment: Annually.

Assessment Methods:

While fluctuations are expected and natural, as the overall enrollment exceeds 100 per year and as policies regarding limiting years to completion are further optimized, it is better to set a minimum goal than a running average in for this assessment tool.

Results 1. PhD Student Enrollment

Goal/Objective/Outcome Number: Goal 1: PhD Student Enrollment

Results:

Fall PhD Enrollment: 2013=48, '14=66, '15=88, '16=85, '17=105, '18=106
3-yr rolling average of PhD enrollment for FY 2019 = 99

Attachments: Attached Files

[Institutional Effectiveness Report - Enrollment Data AY 14 -19.xlsx](#)

Results 2: Increase Degrees Conferred

Goal/Objective/Outcome Number: Goal 2: Increase Degrees Conferred to 20 for 2020-21

Results:

The average years to completion for PhD students is 4-5 years. The impact of the increased enrollment starting in Fall 2014 will be seen after Fall 2018. The data for AY 2018-19 is not completely available, but it is anticipated to be more than 10.

Attachments: Attached Files

[Institutional Effectiveness Report - Enrollment Data AY 14 -19.xlsx](#)

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

Goal/Objective/Outcome Number: Goal 3: Establish Assessment and Continuous Improvement 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.

Attachments:

New Modifications and Continuing Improvement to Goals/Objectives/Outcomes Item

Goal/Objective/Outcome Number:

Program Changes and Actions due to Results:

Link to Assessment:

Link to 'Tech Tomorrow' Strategic Plan:

Responsible Roles: