



GONZAGA
UNIVERSITY

SCHOOL OF ENGINEERING
AND APPLIED SCIENCE

Program Newsletter

www.eng.gonzaga.edu/tandd



T&D Engineering

Now Offering a Master's in T&D Engineering!

We are excited to announce our new Master of Engineering in Transmission and Distribution Engineering. The T&D master's degree is a 36-credit hour program. Students are required to complete a total of 12 courses - three core (from the Transmission or Distribution track), the Engineering Leadership capstone course, and eight from the remaining selection of T&D Program courses.

Students began submitting admission material immediately after the announcement was made in April and the first class of students has been admitted for the Fall, 2011 semester.

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Martin Gulseth (above left) receives his T&D certificate from School of Engineering Dean, Dr. Dennis Horn and Marty's wife, Colleen. Marty entered the program hoping to retrain for the power industry after Agilent Technologies closed its facility in Spokane. He was hired by Avista immediately after completing the 15 credit certificate program.

The T&D program has now awarded 17 T&D certificates and many of those engineers plan to continue to the new master's degree in Transmission & Distribution Engineering.

Another Busy Year!

T&D Director's Annual Report by Peter McKenny, PhD

The T&D program received approval to offer a Master's Degree in Transmission and Distribution Engineering in April, 2011. Students may choose between Transmission or Distribution core tracks and submit final projects from their core courses for their graduation portfolio. The Engineering Leadership course was also revised to become the program capstone course with an on-campus component that will include sessions on ethics, servant leadership, and campus resources over a two-day period.

Program staff spent the past year establishing graduation requirements, preparing application materials, and updating the program website in anticipation of degree approval. Offering an ME has really become essential to sustaining the program as more power companies now limit tuition reimbursements to degree-granting programs only. Several current students have requested the degree information and hope to apply just prior to completing their 15 credit certificate.

The program will continue to offer the certificate option and in 2010 eight more students were awarded a T&D Graduate Certificate. In 2011, eight engineers recently laid off from Agilent Technologies completed courses in the program, with six already placed in full time jobs in the power industry. Four of those engineers have completed six or more T&D courses counting toward the master's degree and hope to continue taking courses toward the degree.

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Congratulations!

2010-11 Certificate Recipients:

Bill Burns **Adam Kampa**
William Bush **Darrell Richardson**
Sean Grier **Zachary Scott**
Allen Johnson **Byard Taylor**

By the Numbers:

- 12 Graduate Level Engineering Courses
- 24 Adjunct Faculty Working in Industry
- 300 Enrollments in Online Courses over 4 Years
- 17 Certificates Awarded
- 71 Current Students Hoping to Complete the T&D Master's
- 75 Apprentices Trained on Power Simulator
- 350 K-12 Students Introduced to the Power Industry



Girl Scouts learn about the power grid and how renewable energy is impacting the grid during an event in the ZagOps Simulator at Gonzaga.

March 2011 marked a program milestone as all 12 courses developed for the program have now been offered to students. Twelve students registered for Underground System Design, the 12th and final (so far) planned course.

Student evaluations continue to be excellent in all courses and only one instructor has retired from teaching in the program's four years of instruction- and that was due to health reasons. The program added four new instructors this year to strengthen some of the courses and ensure courses such as Grid Automation (Smart Grid design techniques) would be offering the most current industry knowledge.

The program began offering classes in 2007 and those first courses are now being revised and updated. The Electric Grid Operations course will be completely overhauled to reflect the impact renewable energy is having on the grid and its reliability.

In all, it's been another busy and productive year and now we look forward to next year with our first master's students beginning in the 2011-12 school year and a renewed focus on power industry research topics, particularly transmission line rebuild and conductor improvements.



Allen Johnson receives his T&D Certificate from School of Engineering Dean, Dr. Dennis Horn.

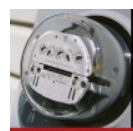


Dr. McKenny was able to present Zachary Scott's certificate in person on a recent trip to Seattle. Zachary is a double-alum, having earned both a BSEE degree ('07) and the T&D certificate from Gonzaga.

ZagOps Regional Training Simulator

The System Operator Training Facility at Gonzaga (ZagOps) continues to be a busy place with innovative trainings being developed and taught over the year. The Director worked with Art Moore, recently retired from Grant County PUD, to develop simulator training which is based upon the actual Northwest grid.

This unique training was requested by regional power companies to improve grid reliability by allowing system operators to practice a realistic blackstart restoration on their own system. Several trainings were held in 2010 and more are planned for the fall of 2011.



T&D Engineering

Online Open House!

Sample Our Courses!

We now have an Online Open House which offers samples of each course and detailed program information. Within six months, more than 50 prospective students had requested log-in information for the Open House, with eight immediately registering for current classes.

Master's Degree (cont.)

Degree Requirements

Thirty-six (36) credits total:

- 33 in T&D courses, including at least 9 in chosen track (used toward graduation portfolio)
- 3 in TADP 556 Engineering Leadership (Capstone)

The master's degree builds on our existing T&D graduate certificate which was developed to provide utility professionals with access to advanced educational opportunities. Each course in the program has been designed in collaboration with power industry experts to provide students with necessary technical and managerial skills for advancement in their power careers.

The multi-disciplined program blends academic rigor with engineering practicum in a series of courses that include civil, electrical, and mechanical engineering, along with engineering leadership topics to form an advanced degree in Transmission and Distribution Engineering.

The degree approval process took nearly a year and a half as the proposal was approved by the School of Engineering & Applied Science, Gonzaga's Faculty and Assessment Committees, the Graduate Curriculum Committee, Academic Vice President, Board of Trustees and finally the Northwest Commission on Colleges and Universities (Gonzaga's accrediting body).

Admission requirements include an engineering degree from an accredited university, GRE test scores, two industry letters of recommendation and the university application. For more information, check out our website at: www.eng.gonzaga.edu/tandd.

* We will continue to offer the 15 credit T&D certificate for those not wishing to seek the master's degree.

The Next Generation

The program contracted with Larry Kite (shown right at a K-12 event) to create introductory training sessions targeted to power industry apprentices, plant operators and engineers, as well as labs for alternative and traditional high school students interested in the power industry.

More than 75 apprentice electricians and community college students have attended the training and several hundred K-12 students have participated in hands-on labs on the power grid simulator.

These trainings have already met Gonzaga's goals in the Department of Energy Smart Grid Workforce Training grant awarded to an energy consortium led by Centralia Community College's Center of Excellence for Clean Energy. Program staff members continue to serve on the Governance Board for the grant and offer technical advice.



Courses:

Distribution Track:

TADP 541 Distribution System Design

TADP 542 Substation Design

TADP 545 System Protection

TADP 547 Underground System Design (both tracks)

TADP 553 Grid Automation

TADP 641 Power System Analysis

Transmission Track:

TADP 540 T-Line Design Intro

TADP 543 Electric Grid Operations

TADP 544 Project Development & Construction Methods

TADP 547 Underground System Design (both tracks)

TADP 548 T-Line Design Electrical Aspects

TADP 640 T-Line Design Advanced

Capstone:

TADP 556 Engineering Leadership



Instructors:

**Frank Frentzas, Lead Engineer,
Transmission Underground
Cable Systems, Exelon
Corporation**

**George R. Matto, Regional
Engineer, The Okonite Company**

Student Feedback:

“This course was an in-depth study of underground cable design and I was pleased with the amount of knowledge I gained.”

“We will need to be replacing our submarine cables in the near future and the resources I have from this course will be extremely beneficial in that regard.”

“We have a lot of underground in our system and this course has been very helpful.”

TADP 547: Underground System Design

This 8-week course provides an introduction to underground power system design. The course is taught by two instructors with extensive knowledge in the design of underground power systems.

In weeks one through three, students gain an introduction to cable systems, types of systems, manufacturing practices and standards. They then cover the uses and design parameters of the equipment needed for an underground system design.

In week four, basic underground cable design practices are reviewed and in week five, students study installation practices for both transmission and distribution projects. In week six, application considerations such as hydraulic pressures, commissioning and industry standards are covered.

In week seven, students review an underground system case study from start to finish that leads to a final assignment of replacing a Low Pressure Fluid-Filled system and upgrading a High Pressure Fluid-Filled system. This final project includes type of cable used, manhole spacing, pulling considerations and all relevant design calculations.



Student Feedback:

“This course will help me immensely in that I have a transmission cable replacement job that is just starting to get moving. I’m very glad that the course offered some presentations of actual cable replacement jobs that had already been done.”

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