The Department

Established when the university opened in 1925, the department is a national leader in the preparation of students for both industry and academia.

With more than 50 years of implementation, the project design laboratories for undergraduates developed at Texas Tech have helped students find solutions to problems in situations “as close to real-life as possible,” mimicking true design risk, showing complexity of environments, and giving students exposure to real industry problems while still in the classroom and laboratory.

For graduate students, close contact with faculty members who are international experts in impactful fields from pulsed power and power electronics to nanophotonics regularly fosters scholarly publications and research breakthroughs.

The department is moving forward in key areas of technological advancement, including smart grids and grid integration for renewable energy, silicon carbide and wide bandgap materials for power electronics and nanophotonics, and biomedical engineering applications.

Research

Led by faculty members who are leaders in their fields of study, graduate and undergraduate students are exposed to the latest advances and perform research in the following areas:

- Cyber-Physical Systems
- Image Processing and Wireless Communications
- Medical Electronics and Medical Image Processing
- Microelectronics
- Nanophotonics/Nanotechnology
- Pulsed Power and Power Electronics
- Smart Electric Power Grids
- Sustainable Energy Systems

Areas of Study

- Bachelor of Science in Electrical Engineering
- Bachelor of Science in Computer Engineering
- Master of Science in Electrical Engineering
- Doctor of Philosophy in Electrical Engineering

By the Numbers

Enrollments (Fall 2014):
- Undergraduate: 256
- Estimated Qualifying Foundational Students: 128
- Master’s: 164
- Doctoral: 59

Faculty Members: 24

Endowed Chairs, Professors, and Fellows: 5

Contacts

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Faculty Research Specializations

Dr. Mary Baker  
**Professor**  
Biomedical Signal Processing, Neuroradiology and Cognition, Medical Image Processing

Dr. Stephen Bayne  
**Associate Professor**  
Power Electronics for Hybrid Electric Vehicles, Design of Compact Power Electronics Converters, Evaluation of Power Devices for Power Electronics & Pulse Power Applications

Dr. Ayton Bernussi  
**Associate Professor**  
Propagation Losses in Silica-on-Silicon Waveguides, High-Power Laser Diodes, Lossless Propagation in Plasmon-Related Waveguides, Time Resolved Luminescence of Semiconductors, Silicon-on-Silica Nanodevices

Dr. Tim Dallas  
**Professor**  
Microelectromechanical Systems (MEMS), Nanocoatings, Wireless Medical Devices

Dr. James Dickens, P.E.  
**Charles Bates Thornton Professor**  
Grounding & Shielding, Explosive Pulsed Power, High-Power Microwaves, Electric Space Propulsion, Aerospace Electronics

Dr. Zhaoyang Fan  
**Associate Professor**  
GaN & ZnO-based Electronic and Optoelectronic Devices & Sensors, Thin-Film & Nanostructure Materials

Dr. Richard Gale, P.E.  
**Professor**  
Micro-Electro-Mechanical-Systems Design, Nanowires

Dr. Michael Giesselmann, P.E.  
**Department Chair and Professor**  
MW-Level Motor Drives, Compact Pulsed Power, Renewable Energy, Power Electronics, Pulsed Power, Power Systems

Dr. Miao He  
**Assistant Professor**  
Cyber-physical power systems, Monitoring and data fusion towards secure smart grids, Power system operations with high penetration of renewable resources, Online dynamic security assessment of power systems using PMU measurements

Dr. Hongxing Jiang  
**Horn Professor and Whitacre Chair**  

Dr. Ravindra Joshi  
**Professor**  
Pulsed Power and High Power Microwaves, High Field Transport and Semiconductor Modeling, Electrophysics, Bio-electrics

Dr. Tanja Karp  
**Associate Professor**  
Multirate Signal Processing, Multicarrier Communications, STEM, Engineering Education

Dr. Changzhi Li  
**Associate Professor**  
Doppler radar for biomedical and structural health monitoring, CMOS RF and analog circuits, Microwave circuits

Dr. Donald Lie  
**Keh-Shew Lu Regents Chair and Professor**  
Low-Power RF/Analog Integrated Circuits & System-on-a-Chip (SoC) Design and Test, Interdisciplinary Research on Medical Electronics, Biosensors, & Biosignal Processing

Dr. Jingyu Lin  
**Horn Professor and Whitacre Chair**  

Dr. John Mankowski, P.E.  
**Associate Professor**  
Electric Space Propulsion, Liquid & Gas Discharge Physics, Railgun Technology, Explosive Pulsed Power, High-Power Microwave Generation

Dr. Andreas Neuber, P.E.  
**Horn Professor and AT&T Professor**  
HV Electric Breakdown, Gaseous Electronics, Materials Under Shock, High-Power Microwaves, Pulsed Power Technology

Dr. Sergey Nikishin  
**Professor**  
Semiconductors (Si, Ge, III-V, chalcopyrites) and dielectrics, LED and laser diodes, photodetectors, solar cells, and FETs, Epitaxial growth and semiconductor processing, Design and fabrication of nano- and micro- electronic and photonic devices

Dr. Brian Nutter, P.E.  
**Associate Professor**  
Biomedical Imaging, Embedded Systems

Dr. Ranadip Pal  
**Associate Professor**  
Genomic Signal Processing, Stochastic Modeling & Control, Computational Biology, Image Processing

Dr. Vitalt Rao  
**Professor**  
Electrical Energy Smart Grid Technologies, Smart Structural Systems, Tera-Hertz Technologies, Cyber Systems, Robust Control Systems, Data Fusion & Mining

Dr. Mohammed Saed  
**Associate Professor**  
Microwaves, Antennae

Dr. Hamed Sari-Sarraf, P.E.  
**Professor**  
Image Processing, Pattern Recognition

Open Faculty Positions

- Computer Engineering
- Nanophotonics
- Pulsed Power
- Smart Grids