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RESEARCH: PAST & PRESENT

Plasma research at Texas Tech University started in 1966. The initial work was concerned with harmonic ion cyclotron resonances in small mirror machines and tokamaks, laser heating of magnetized plasmas, and pellet injection in hot dense plasmas. Later, the emphasis was on theoretical wave propagation and turbulence studies along with applications of plasma technology to pulsed power devices, plasma synthesis of thin films, and electric space propulsion engines.

Pulsed power research at Texas Tech University began in the early 1970s with studies in high beta, controlled thermonuclear fusion. These initial investigations at Texas Tech, along with other developments in the field, established the need for a better understanding of the physical phenomena of pulsed power technology. High power switching, fast insulator breakdown, compact power supply and power system design, materials studies, and high power microwaves are major priority research areas and have today become the main emphasis of the Texas Tech University Pulsed Power Research Program. The program is interdisciplinary and involves faculty members from Electrical and Computer Engineering, Mechanical Engineering, and Physics.

COURSE OVERVIEW

The course is designed for Electrical Engineers, Mechanical Engineers, Physicists, and any other professionals who are involved in the work of pulsed power and power electronics (P3E). In this course, you will be introduced to the basics of pulsed power technology.

This course will be presented in a lecture format by the faculty and research staff of the Center for Pulsed Power & Power Electronics at Texas Tech University. Following the course lectures, attendees are invited to take a tour of the Texas Tech Center for Pulsed Power and Power Electronics

COURSE TOPICS INCLUDE:

- Introduction to Pulsed Power
- Basic Circuits
- Electromagnetic Field Theory
- High Voltage Breakdown and Physics
- Charging Power Supplies
- Electromagnetic Field Simulations
- Solid State Switching
- High Power Vacuum and Gas Switches
- Pulse Generation
- Voltage Multipliers
- Diagnostics
- Grounding, Shielding, and Safety
- Computer Simulations
- Compact and Explosive Pulsed Power
- Applications

Each topic will be covered in a 1–3 hour lecture format.

Cover image: Diffuse, nanosecond high voltage vacuum surface flashover and anode illumination

Interior flap: Anode-initiated, nanosecond high voltage vacuum surface flashover

Interior left: Self-break spark gap testing at moderate pulse repetition rate

The Center for Pulsed Power & Power Electronics
Department of Electrical and Computer Engineering
Texas Tech University, Lubbock, TX 79409-3102
P 806.742.3468 | F 806.742.1281 | E p3e@ttu.edu
www.p3e.ttu.edu

A SHORT COURSE IN

PULSED POWER

JAN 7–9, 2025 | LUBBOCK, TX



**CENTER FOR
PULSED POWER &
POWER ELECTRONICS**

TEXAS TECH
Whitacre College of Engineering

GENERAL INFORMATION

LOCATION

The Merket-McKenzie Alumni Center on the Texas Tech University campus, Lubbock, Texas.

FEE

The fee for the course is \$2550. The fee includes short course notes, an electronic copy of the presentations, lunches, break refreshments, and a barbecue dinner.

REGISTRATION

For registration details please visit: p3e.ttu.edu

Deadline for registration is December 1, 2024. This course will be canceled if there are insufficient registrants by this date.

CANCELLATIONS/REFUNDS

A full refund of your registration fee, less a \$100 processing charge, will be granted for refund requests received by December 1, 2024. Thereafter, only partial refunds can be granted, less \$1,000 processing charge.

HOTELS

Room blocks have been reserved for the Pulsed Power Short Course at the following hotels:

Overton Hotel

2322 Mac Davis Lane. Lubbock, TX, 79401
\$130/night, available until 12/23/2024

[Reservation link here](#)

Staybridge Suites (closest to the venue)

2515 19th St., Lubbock, TX, 79410
\$92/night, available until 12/25/2024

[Reservation link here](#)

(Click group rate and use code PPP)

COURSE SCHEDULE

TUESDAY 1/7

8:00–8:30am	Registration/Check In
8:30–9:00am	Introduction
9:00–11:00am	Basic Circuits Energy Storage EM Fields Basics
12:00–1:00pm	Lunch
1:00–5:00pm	EM Simulation Breakdown Physics Charging Power Supplies

WEDNESDAY 1/8

8:00am–12:00pm	High Power Switching
12:00–1:00pm	Lunch
1:00–5:00pm	Pulse Generators Voltage Multipliers Grounding & Shielding
6:00–9:00pm	BBQ Dinner

THURSDAY 1/9

8:00am–12:00pm	Diagnostics Computer Simulations Compact & Explosive Pulsed Power
12:00–1:00pm	Lunch
1:00–5:00pm	Applications Laboratory Tour

Topic details and order subject to change

COURSE FACULTY

Dr. James Dickens: Charles Bates Thornton Professor of Electrical & Computer Engineering at Texas Tech University and Co-Director of the Center for Pulsed Power and Power Electronics. Research specialties include Photoconductive Pulsed Power Switching, Fast High Voltage Systems and Diagnostics, Wide bandgap and Ultrawide Bandgap Materials for Pulsed Power Applications.

Dr. Mike Giesselmann: Interim ECE Chair and Professor of Electrical & Computer Engineering at Texas Tech University. Research specialties include Gas Discharges, Electrical and Optical Diagnostics, HV Measurement Techniques, High Power Switching, Power Electronics.

Dr. John Mankowski: Professor of Electrical & Computer Engineering at Texas Tech University. Research specialties include Pulsed Power Technology, Electric Space Propulsion, Liquid and Gas Discharge Physics, Railgun Technology, Explosive Pulsed Power, and High Power Microwave Generation.

Dr. Andreas Neuber: Paul Whitfield Horn and AT&T Professor of Electrical & Computer Engineering at Texas Tech University and Co-Director of the Center for Pulsed Power & Power Electronics. Research specialties include Dielectric Surface Flashover, HV Electric Breakdown, High Power Microwaves, Pulsed Power Technology, Non-intrusive high speed plasma diagnostic (OSE, LIF, CARS, Raman).

Dr. Jacob Stephens: Associate Professor of Electrical & Computer Engineering at Texas Tech University. Research specialties include High Power Microwaves and Electromagnetics, Compact Pulsed Power, Large-Scale Pulsed Power, and Low Temperature Plasmas.

More Information:

806.742.3468 | p3e@ttu.edu