



Spring 2025

FIU | **Engineering
& Computing**
Electrical and Computer Engineering



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Class's: EEL 6836



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Class's: EEL 4005



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Class's: EEL 6803



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Class's: EEL 4930, EEL5935



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Class's: EEL 5482



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Class's: EEE 6395



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Class's: EEL 6468

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FALL 2024

IN PERSON TUTORING SCHEDULE

TUTORING WILL BE AVAILABLE IN PERSON AND VIRTUALLY
FOR THE FOLLOWING ENGINEERING COURSES THIS SEMESTER:

EEL3110 CIRCUIT ANALYSIS

MONDAY: 10:00AM - 12:00PM
1:00PM - 4:00PM
TUESDAY: 1:00PM - 4:00PM
WEDNESDAY: 11:00AM - 12:00PM
1:00PM - 2:00PM
FRIDAY: 11:00AM - 12:00PM
1:00PM - 2:00PM

EEL2880 SOFTWARE TECHNIQUES

MONDAY: 1:00PM - 4:00PM
TUESDAY: 1:00PM - 4:00PM

EGN3311 STATICS

WEDNESDAY: 1:00PM - 5:00PM
THURSDAY: 11:00AM - 12:00PM
1:00PM - 6:00PM

EEE 3303 ELECTRONICS I

MONDAY: 1:00PM - 3:00PM

EGM 3520 MECHANICS OF MATERIALS

WEDNESDAY: 1:00PM - 5:00PM
THURSDAY: 11:00AM - 12:00PM
1:00PM - 6:00PM

CGN2420 COMPUTER TOOLS FOR CIVIL E

WEDNESDAY: 1:00PM - 5:00PM
THURSDAY: 1:00PM - 6:00PM

CES3100 STRUCTURAL ANALYSIS

WEDNESDAY: 1:00PM - 5:00PM
THURSDAY: 1:00PM - 6:00PM

EGN3613 ENGINEERING ECONOMY

MONDAY: 1:00PM - 4:00PM
TUESDAY: 1:00PM - 4:00PM

E-mail: cd-ssec@fiu.edu
to schedule sessions

The logo for Florida International University (FIU), consisting of the letters 'FIU' in a bold, white, serif font with a horizontal line underneath.

Center for Diversity
and Student Success

In Person Tutoring held across the Panther Pit EC2760

FALL 2024

ONLINE TUTORING SCHEDULE

TUTORING WILL BE AVAILABLE IN PERSON AND VIRTUALLY
FOR THE FOLLOWING ENGINEERING COURSES THIS SEMESTER:

EEL3110 CIRCUIT ANALYSIS

WEDNESDAY: 1:00PM - 7:00PM
THURSDAY: 11:00AM - 12:00PM
FRIDAY: 1:00PM - 7:00PM
SATURDAY: 1:00PM - 7:00PM

EEL2880 SOFTWARE TECHNIQUES

WEDNESDAY: 1:00PM - 7:00PM
THURSDAY: 11:00AM - 12:00PM
FRIDAY: 1:00PM - 7:00PM
SATURDAY: 1:00PM - 7:00PM

EGN3321 DYNAMICS

MONDAY: 5:00PM - 7:00PM
TUESDAY: 5:00PM - 7:00PM
WEDNESDAY: 5:00PM - 7:00PM
THURSDAY: 5:00PM - 7:00PM
FRIDAY: 5:00PM - 7:00PM

EGN3311 STATICS

MONDAY: 5:00PM - 7:00PM
TUESDAY: 5:00PM - 7:00PM
1:00PM - 7:00PM
WEDNESDAY: 5:00AM - 7:00PM
THURSDAY: 5:00PM - 7:00PM
FRIDAY: 1:00PM - 7:00PM

EGM 3520 MECHANICS OF MATERIALS

MONDAY: 5:00PM - 7:00PM
TUESDAY: 5:00PM - 7:00PM
1:00PM - 7:00PM
WEDNESDAY: 5:00AM - 7:00PM
THURSDAY: 5:00PM - 7:00PM
FRIDAY: 1:00PM - 7:00PM

CGN2420 COMPUTER TOOLS FOR CIVIL E

FRIDAY: 1:00PM - 6:00PM

CES3100 STRUCTURAL ANALYSIS

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WEDNESDAY: 1:00PM - 7:00PM
FRIDAY: 1:00PM - 7:00PM
SATURDAY: 1:00PM - 7:00PM

E-mail: cd-ssec@fiu.edu
to schedule sessions

The logo for Florida International University (FIU) is displayed in a large, bold, white serif font with a black outline, set against a dark blue background.

Center for Diversity
and Student Success

Want to Build Solid Skill on PCB Design of Industrial-Level Electronics?

Welcome to **EEE4761** AI Embedded Hardware Design and Implementation (*Previously, Embedded Systems Design and Implementation for IoT applications*) which provides hands-on experience in the hardware design and AI implementation of an edge device using Eagle/Autodesk PCB design software. Topics Covered:

- AI platform of hardware, SoC, sensors, AI standards
 - AI design constraints: I/O capacity, battery capacity, heat dissipation
 - capacity, human attention
 - Microcontroller and sensor communications using USART, I2C, and SPI
- PCB schematics, board layers, and libraries

Industrial Level
PCB Designs



Past students' experience:

"Being able to use tools that can be used in industry (Eagle AutoCAD) provided me with a valuable skill. I appreciate how we used known examples to first practice and by the end we used the skills to explore and work on our own creative schematics and diagrams."

"This course able us to learn PCB design which is the most important skill for electrical engineers."

"This course is highly practical, helping to enhance design skills and better lay the foundation for theoretical understanding."



More info: <https://hcps.fiu.edu/>
Contact: Dr. Bai, obai@fiu.edu

EEE 6395 Applied Superconductivity

Join Dr. Larkins as he uses over 40 years of real world and research experience to guide you through the exploration of the mysterious realm of superconductivity. Starting with the lowly hydrogen atom and its noble cousin, helium, we will examine the causes of superconductivity, models for superconductors and how to use this novel and wonderful material in engineering applications of the 21st Century and beyond.

This course will cover:

- 1. The fundamentals of superconductivity, why it exists, and the basic properties of superconductivity in bulk materials.*
- 2. The macroscopic applications of bulk superconductors (power transmission, magnetic levitation etc.) and the limitations involved.*
- 3. The applications and limitations of thin superconducting films in rf and microelectronics.*
- 4. Monolayer superconductors and 2-dimensional superconducting materials, their advantages and disadvantages.*
- 5. Aspects of Quantum superconductive devices, how they work and what their fundamental limitations are.*
- 6. Elementary RSFQ Logic Gates.*
- 7. Quantum computing elements using superconducting Qubits.*

Your coursework will include guided problems on the fundamentals of superconductivity and the writing of several term papers on aspects of superconductivity that the student and Dr. Larkins mutually agree upon.

Come and Explore the Future!

Want to Build Solid Skill on PCB Design of Industrial-Level Electronics?

Welcome to **EEE6765** Advanced Embedded Systems Design and Implementation for IoT Applications. You will

- Understand PCB Fundamentals and Electronic Design Objectives
- Gain hands-on experience with industry-standard PCB design of Autodesk Fusion Electronics
- Develop the ability to create clear and organized schematic diagrams that accurately represent electronic circuits
- Learn best practices for PCB layout, including component placement, routing strategies, and layer stackup considerations.
- Understand the importance of layout optimization for signal integrity, thermal management, and manufacturability

Industrial Level
PCB Designs



Past students' experience:

"Being able to use tools that can be used in industry (Eagle AutoCAD) provided me with a valuable skill. I appreciate how we used known examples to first practice and by the end we used the skills to explore and work on our own creative schematics and diagrams. Dr. Bai is very knowledgeable in the field to provide great feedback and learn throughout the semester."

"overall professor Bai is one of the best instructors i had taken class with. he is nice person and very good instructors."

"This course able us to learn PCB design which is the most important skill for electrical engineers."

"This course is highly practical, helping to enhance design skills and better lay the foundation for theoretical understanding."

More info: <https://hcps.fiu.edu/?p=686>

Contact: Dr. Bai, obai@fiu.edu

EEL 4005: Measurements and Instrumentation in Electrical Engineering

Spring 2025

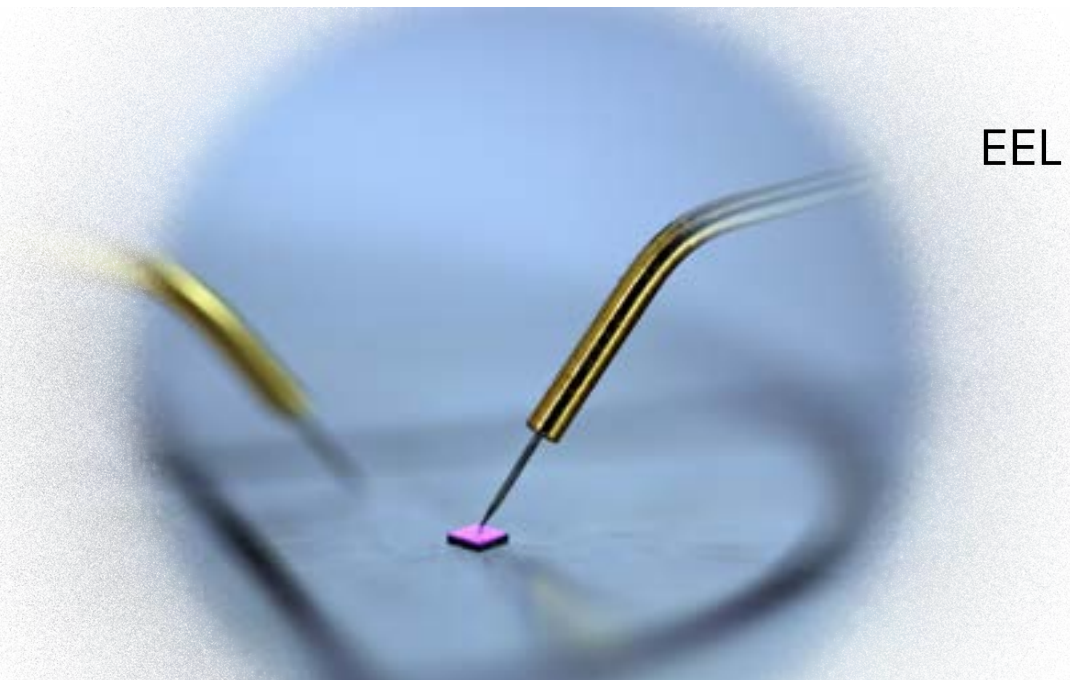
Mondays and Wednesdays 9:30am –10:45am EC1109 and Lab

Contact:

vpozdin@fiu.edu

Prerequisites:

EEL 3110C and EEL 2880



This course provides theoretical, hands-on, and computational introduction to electrical measurements, instrumentation, and metrology. Students will examine how electronic measurements are conducted in real-world situations, engage in interactive labs, and utilize cutting-edge software tools to collect measurements and model devices. In addition, this course delves into advanced instrumentation concepts, including measurements in noisy environments, lock-in amplifiers, cryogenic temperature measurements, and safety.

Course Topics

Basic concepts and terminology of electrical measurements, instrumentation, and metrology.

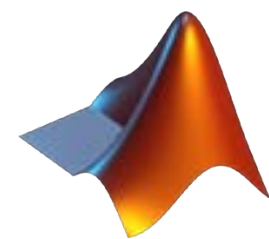
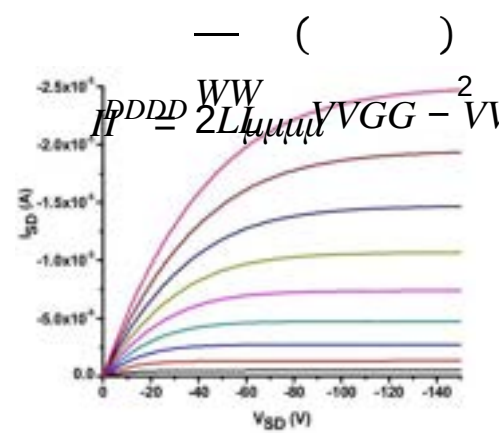
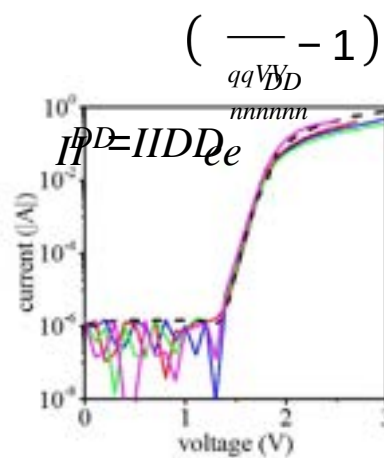
Measurements used in electrical engineering practice and research, including typical noise sources.

Development of measurement instrumentation that incorporates noise minimization techniques.

Use of LabView for control of instruments for data acquisition.

Use of Matlab for data processing and fitting.

Use of Cadence to model and extract device parameters based on collected data.



cadence[®]



Instrumentation and Control Systems for Nuclear Power Plants Spring 2025



EEL 4930

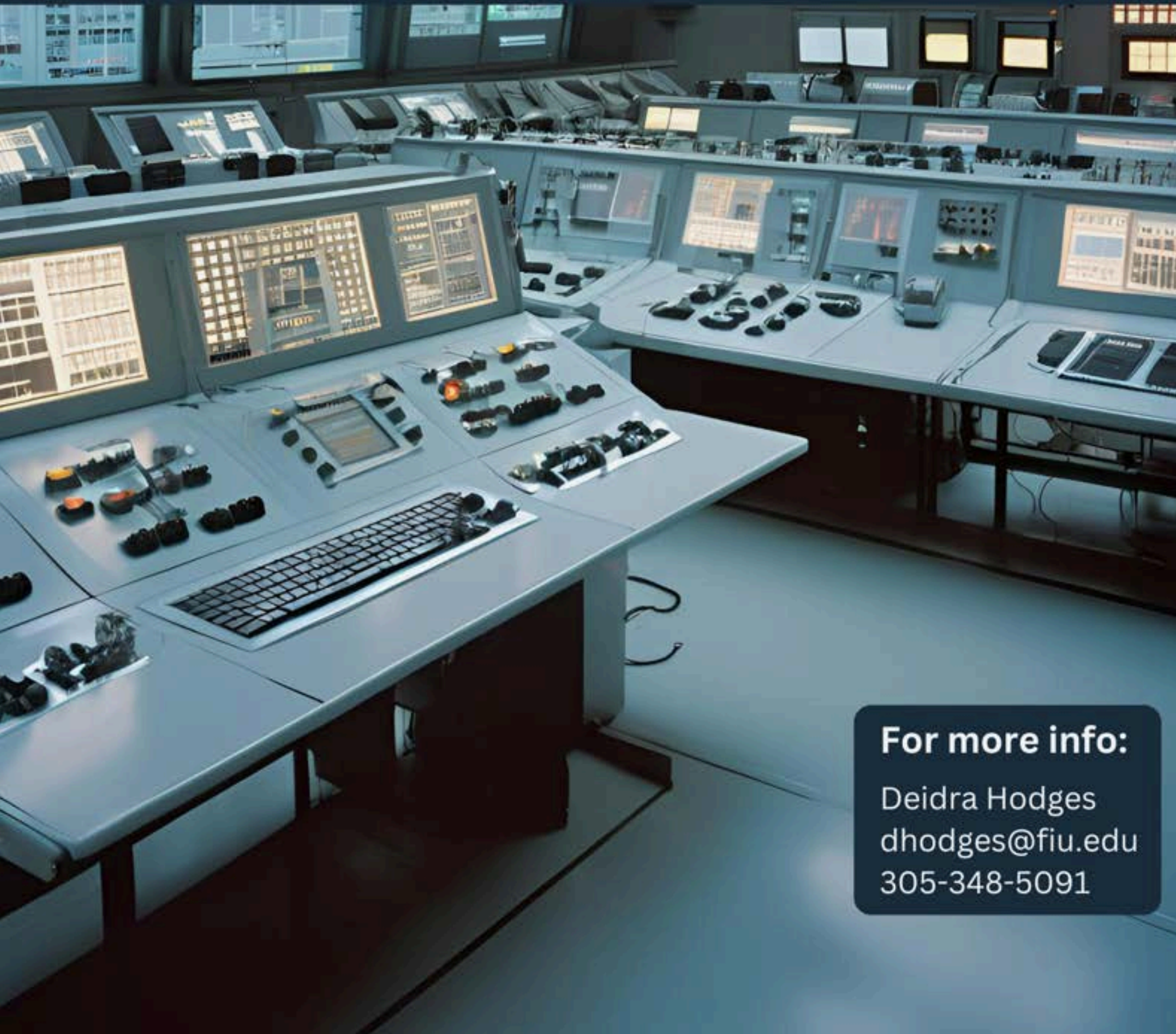
EEL 5935

Mon/Wed

5:00pm - 6:15pm

Topics Covered:

- Control of Nuclear Power Plants
- Fundamentals of analog I&C systems
- Modeling of intelligent control systems
- Control System design of nuclear applications
- Radiation monitoring in the working areas
- Electrical Systems



For more info:

Deidra Hodges
dhodges@fiu.edu
305-348-5091

EEL 5482: Fields & Waves Engineering

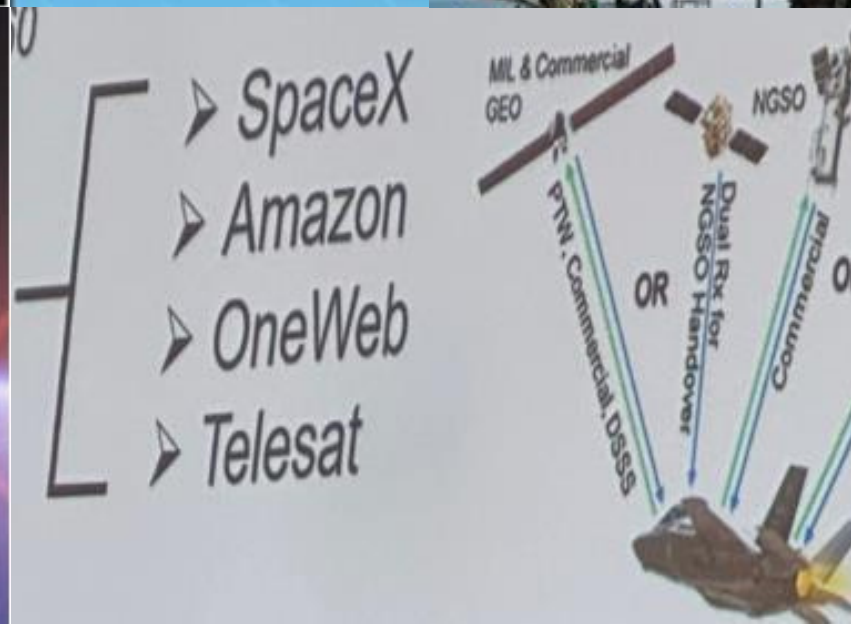
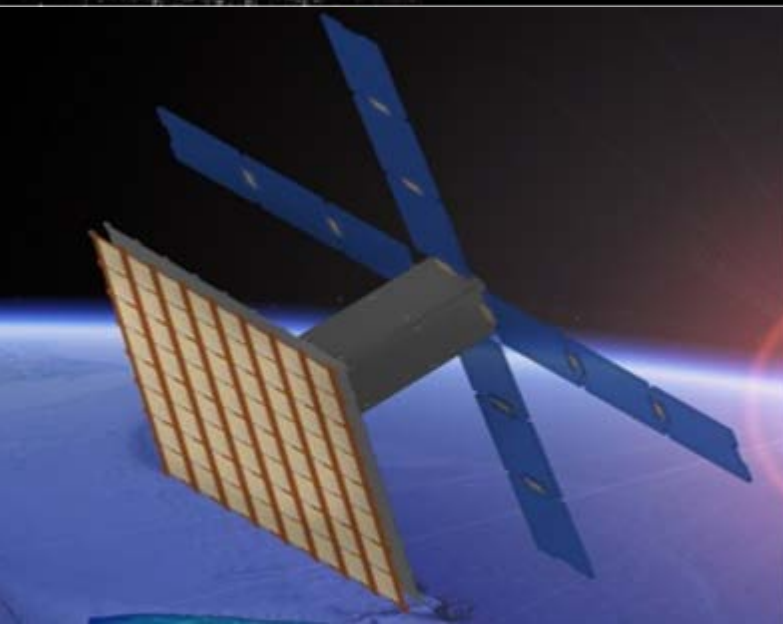
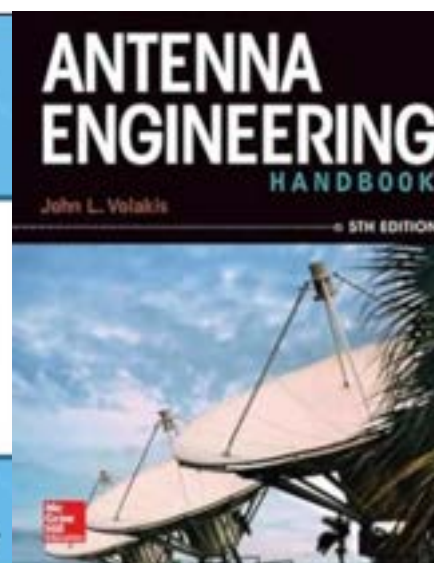
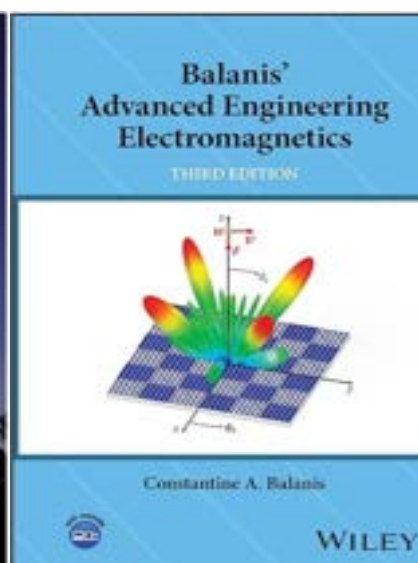
Spring 2025

This is a standard first year graduate course on Fields and Waves. It covers the fundamentals of guided waves, communication links and propagation, including Radio Frequency (RF) sources, waveguides, fiber optics, metamaterials, adv. antennas and arrays, automotive radars, and basics of well-known numerical techniques. Moreover, it covers methods to simplify RF/electromagnetic problems into practical set-ups for numerical solutions, including high density RF packages for chips and EMI/EMC applications. The course is a must for expertise in microwaves, antennas, radars, and for electromagnetic interference and compatibility.

Prerequisite: Basic knowledge of fields and waves and graduate standing (EEL 4410 Fields & Waves).
Recommended Book: Adv. Engineering Electromagnetics, 3rd ed, by Balanis (all material will be in slides)
Instructor: Prof. John Volakis - author of Antenna Engineering Handbook and 8 other books

Why take this course: Wireless technologies will continue to change our lives. In this course, you will learn:

- 1) Key components that make a radio or a cell phone work;
- 2) Satellite communications links (a rapidly growing field);
- 3) How RF/microwave electronics and sources operate;
- 4) About metamaterial properties;
- 5) How key software packages work;
- 6) About radars & automotive guidance;
- 7) About satellite links and RF front- ends/chips.



Want to learn technologies supporting autonomous robots/vehicles?

Welcome to **EEL5669** Autonomous Systems and Controls. You will

- Understand the basic principles of mobile robotics
- Gain knowledge of various types of locomotion mechanisms used in mobile robots
- Learn about sensors and perception techniques employed in mobile robotics
- Explore methods for robot localization and mapping
- Understand path-planning algorithms for autonomous navigation

Hands-on & Creative Projects

Obstacle Avoidance



**Line Tracking w/
Broken Lines**



Past students' experience:

"The way in which Dr. Bai taught and guided us was incredible, and at the same time, he, through each module seen in class, provided us with solid knowledge regarding this science, robotic engineering. His teaching was excellent. Also, I think that the study of robotics sciences was encouraged in a simple way..."

"the course material was extremely interesting, and the professor engaged us into learning"

"Learning about how to integrate the electrical, mechanical and mathematical concepts into developing a successful autonomous robot."

"The projects we did were the most successful part of this class it helped us learn about a computer software program that can help student get more into robotic simulation"

More info: <https://hcps.fiu.edu/?p=678>

Contact: Dr. Bai, obai@fiu.edu



Jan 06, 2025 - April 26, 2025



Thursday, 5:00 to 7:40 PM



Engineering Center 3930



EEL 4215 or permission of
Instructor

Spring 2025

EEL 6273 - POWER SYSTEM STABILITY AND CONTROL

Course Objectives

- Introduce students to practical alternate Energy grid integration issues
- Introduce students to distributed generation technologies and their impacts on power system stability and control.
- Introduction to new technologies of Phasor measurements and smart grid integration issues
- Discuss methods for power system stability and control
- Identify component models for system stability and study transient stability issues and their solution techniques
- Formulate the transient stability for large-scale systems and study of power system control and multi-area control
- Involve students in practical power systems stability and control through the term project.

Course Topics

- Alternate Energy Grid Integration Issues
- Distributed Generation Technologies and the Economics of Distributed Resources in power system stability and control.
- Introduction to Phasor measurements and Smart Grid Integration Issues
- Formulation of the power system stability problem (Generator models for system stability, Transient Stability and Dynamic operation, Stability Criteria)
- Longer-term stability and static and dynamic security assessments
- Introduction to Power systems controls, multi-area control, and automatic generation control.
- Case studies and applications

Prof. Osama A. Mohammed

mohammed@fiu.edu
305 348-3040

Faculty

<http://www.aln.fiu.edu/EEL6273>



EEL 6468 – Adaptive and Smart Antennas

Department of Electrical & Computer Engineering

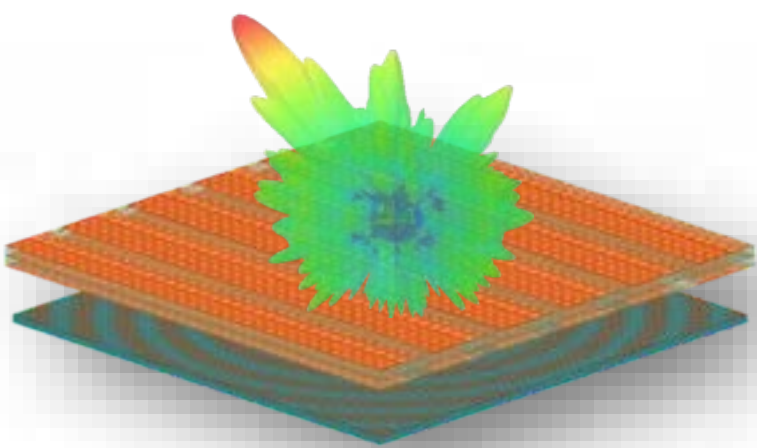
Florida International University

Spring, 2025

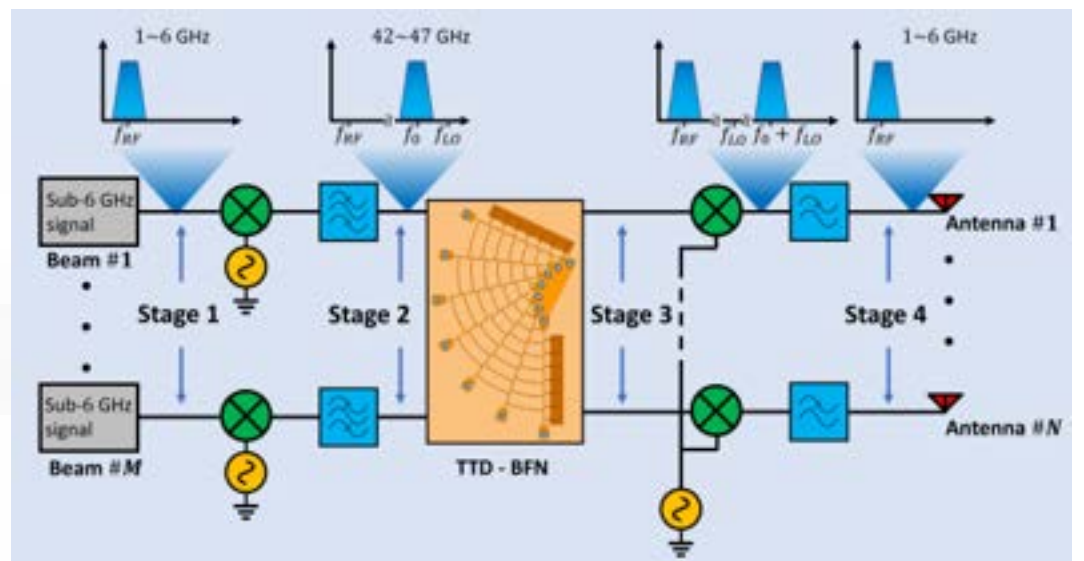
Class Time MoWe 3:00PM - 4:15PM **Classroom** EC 3930

Faculty Dr. Constantinos Zekios

This course covers advanced concepts on phased arrays



antenna principles



beamforming principles

semiconductor technology

Identify, Formulate, Solve Antenna Problems

Active Learning

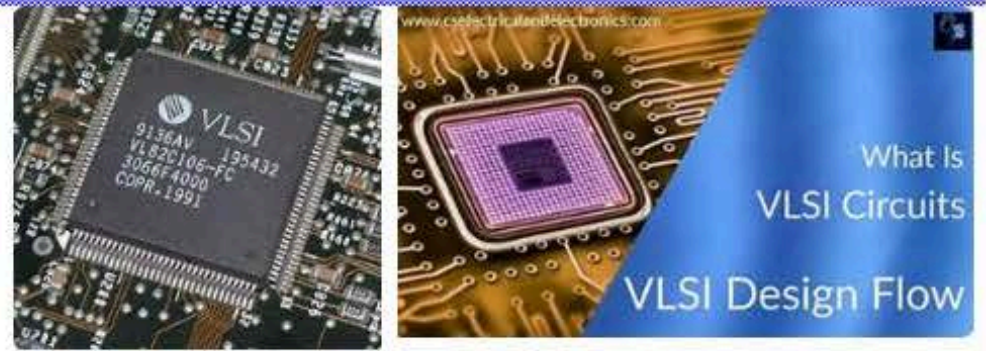
Projects & Assignments

Understand Antenna & Microwave Theory

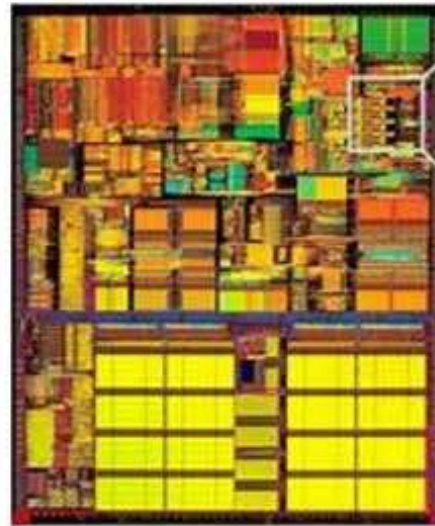
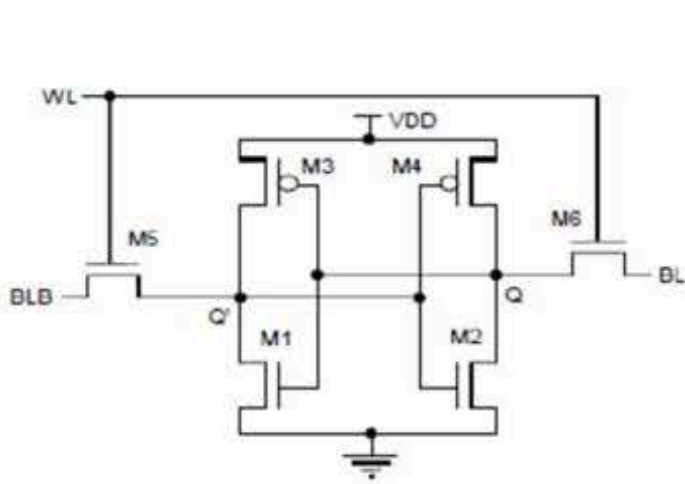


EEL 6726 Advanced VLSI Design

Class Dates: Tue, Thurs
Days and Time: 9:30 AM – 10:45 AM
Rooms: EC 1110



Course Overview: This course covers advanced digital VLSI design in CMOS technology by studying underlying theory, design, and techniques. Students gain an understanding of the different phases involved in designing a complete VLSI in silicon. Finally, it provides hands-on experience with industry-standard VLSI CAD tools.



For more information, contact Prof. Mst Shamim Ara Shawkat, (305) 348-5128, mshawkat@fiu.edu

Course Topics:

- MOS Transistor, CMOS Logic, and Logic Gates
- Combinational MOS logic circuits
- Sequential MOS Logic Circuits: Flip-Flops, Counter, Shift Registers, and Synchronous System Design
- Memory Arrays: ROM, RAM, DRAM, SRAM
- Implementation of Logic with Memory Arrays
- Logic Arrays: PLAs, FPGA
- Hands-on experience with VLSI CAD Tools: Cadence Virtuoso – Circuit (transistor-level) schematic entry, Spectre/SPICE – Circuit simulation tools, etc.
- Projects: Apply learned concepts and skills for VLSI design, simulation, and verification

Course Benefits:

- In-depth understanding of CMOS VLSI design
- Improved understanding of system design and integration
- Exposure to Advanced Design Techniques
- Gains skills in advanced VLSI design
- Hands-on experience with industry-standard VLSI CAD Tools
- Involving in team-oriented real-world VLSI projects to design, simulate, and verify
- Preparation for VLSI related Careers
- Competitive advantages in technology-driven fields

For more information, contact Prof. Mst Shamim Ara Shawkat, (305) 348-5128, mshawkat@fiu.edu

FIU - ELECTRICAL AND COMPUTER ENGINEERING

EEL6803 ADVANCED DIGITAL FORENSICS

Dive into the world of digital forensics with this introductory course. Learn the fundamentals of investigating digital crimes, analyzing digital evidence, and understanding the legal and ethical considerations in the field. Perfect for those looking to enhance their computer engineering and cybersecurity technical skills.

- **Digital Evidence Collection**
- **Data Extraction Techniques**
- **Network Forensics**
- **Mobile Device Forensics**
- **Legal and Ethical Issues in Digital Forensics**
- **Emphasis on hands-on labs and practical exercises**

FACULTY: GUSTAVO CHAPARRO
email: gchaparr@fiu.edu

CLASS TIME: FR 6:00 PM - 8:30

PM CLASSROOM: EC-1109

Deliverables:

- 3 hands-on projects assignments
- 1 research paper presentation
- 1 final research project paper
- 1 final take-home exam

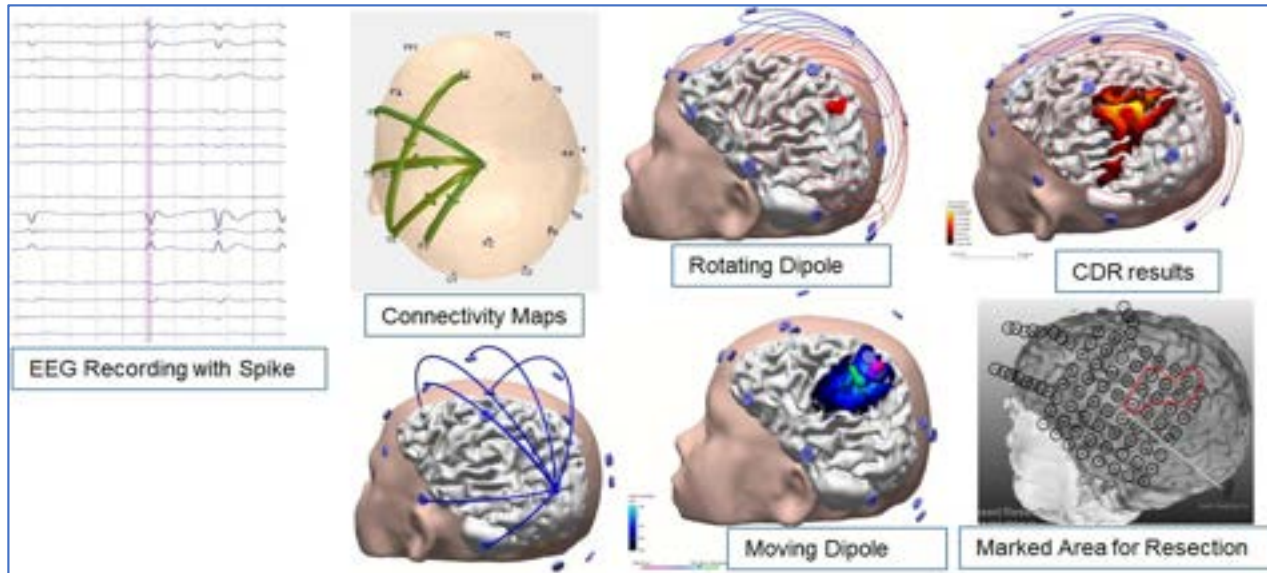
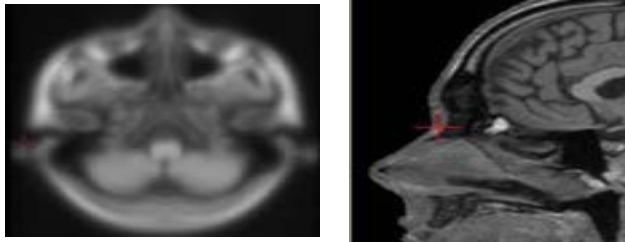
SPRING 2025

EEL 6836 Computer Visualization of the Electrical Brain Activity

Course Summary:

The use of signal and image processing techniques to improve the medical assessment of different neurological disorders

Upcoming Sessions
Fall 2023
Tuesday & Thursday
2:00 pm –3:15pm



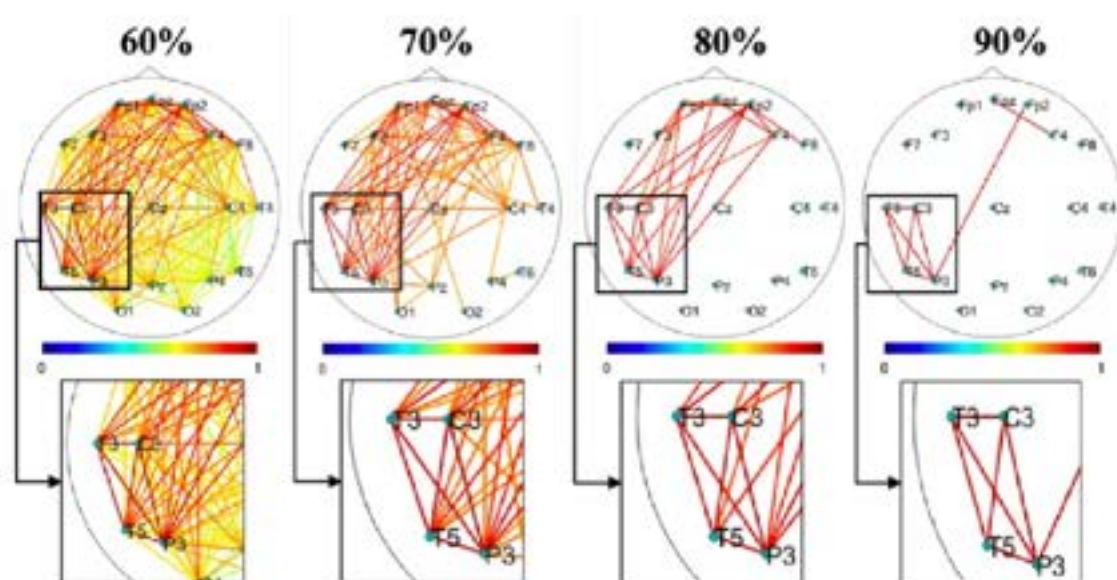
Main Topics:

- EEG brain signals and MRI processing
- Acquisition of EEG signals using current technology
- Applications of EEG with other neurological imaging techniques (MRI, PET, CT, fMRI, MEP, etc.)
- The use of Transcranial Magnetic Stimulation (TMS) and its applications

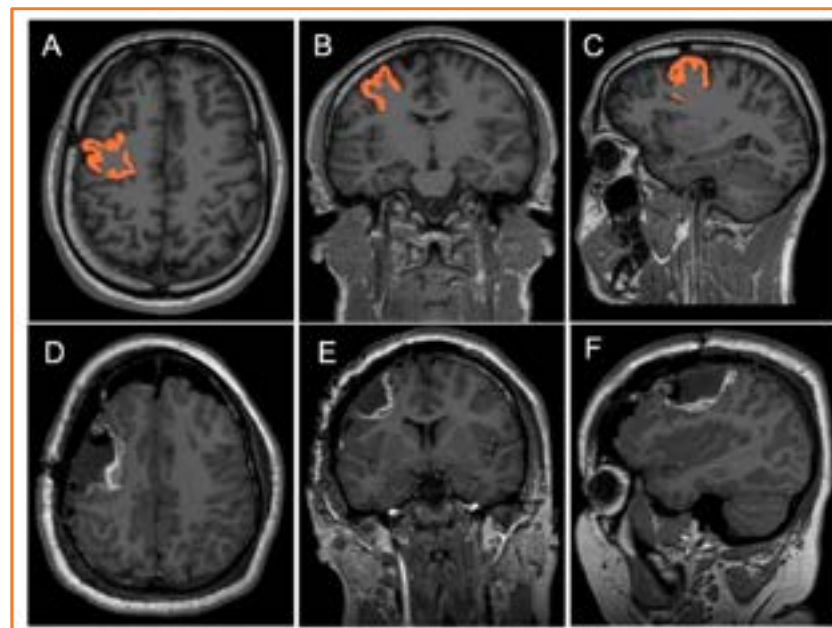
Course Benefits:

- Provide comprehensive introduction to neurophysiological signals in order to interpret the human brain
- Introduce students to acquire and process real brain signals for real world implementation.
- Expose students to current hospital technologies for brain research
- Involve students in a team-oriented project to generate medical applications

EEG connectivity maps aligned with MRI brain cortex to localize the epileptic focus.



EEG topological maps presenting functional connectivity analysis using different thresholds.



Comparison between the preoperative and postoperative MRI scans for epileptic patients.

Want to learn technologies supporting Robotic systems, Instrumentation, and Control?

Welcome to **EEL1XXX** Introduction to Robotic Systems, Instrumentation and Control. You will

- understand the basic principles of mobile robotics
- Learn about sensors and perception techniques employed in mobile robotics
- Gain knowledge of robotic controls and Linux-based robotic system
- Explore methods for robotic vision and autonomous navigation
- Hands on different robotic modules

Hands-on & Creative Projects

Ball Detection



Line Tracking with robotic vision



Course Description:

“Introduce the fundamentals of robot types and operating systems, master essential sensors and control methods through Python programming, and advance to sophisticated robotics vision with OpenCV for real-time color detection, face recognition, and obstacle avoidance. Elevate your expertise with hands-on projects involving autonomous movement and navigation, using cutting-edge technologies like LiDAR and SLAM mapping. Whether you're a budding enthusiast or an aspiring professional, this course will transform your understanding of robotics and prepare you for the technological challenges of tomorrow.”

Contact: Dr. Bai, obai@fiu.edu

FIU

Engineering & Computing

Electrical and Computer Engineering



<https://ece.fiu.edu/index.html>

FIU | Engineering & Computing

Electrical and Computer Engineering

Florida International University

College of Engineering & Computing

Department of Electrical and Computer Engineering

1055 West Flagler Street, EC 3900

