

**FLORIDA INTERNATIONAL UNIVERSITY
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
EEL-6267 Application of Intelligent Systems to Power System Operations
Spring 2019**

INFORMATION SHEET AND COURSE TOPICS

COURSE INSTRUCTOR:

Professor Osama A. Mohammed
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**<http://www.aln.fiu.edu/courses/eel6267>
Course Registration Required**

CLASS TIMES: Fridays 3:30-5.00PM, EC-2710

OFFICE HOURS: Fridays 1:00-2:00PM

OFFICE: EC-2441, Laboratory in EC-3960 (Tel: 305-348-6194)

PRE-REQUISITE: EEL-4213 or permission of instructor

CREDIT HOURS: 3 Hours

TEXT BOOK AND NOTES and SOFTWARE:

1. Selected lecture notes and other demonstration material and examples will be made available as authored by Professor Mohammed.
2. Software package will be made available to students. Also, other downloadable programs and other pointers will be made available under the virtual office area.

Who Should Take this course:

- FIU Electrical and Computer Engineering Graduate/Advanced Students
- Graduate or Advanced Students at other Universities in Florida or out of State

- Engineers and technical personnel in Industry preparing for Engineering License
- Engineers and technical staff who want to keep current and reach a deep understanding of Power System Operation, Generation and Control concepts.
- Electric Utility managers and supervisors looking for continued training.
- Engineering contractors and consultants for familiarities with electric utility operation

Catalogue Data:

EEL 6267 Application of Intelligent Systems to Power System Operations (3 credit hours). Power system security assessment using intelligence systems techniques such as pattern recognition, expert systems, and neural networks. Class projects include applying IS to load forecasting, alarm processing. Permission of instructor.

Objectives:

1. Discuss advanced topics in power system operations and security issues
2. Cover intelligent systems techniques currently being utilized in system operations
3. Study the practical ways of implementing neural networks, Genetic Algorithms, Fuzzy logic, and expert systems in power system operations
4. Cover Projects in Load Forecasting, Economic Operations, Unit Commitment, Security Assessment and alarm processing, Power quality, Harmonic Identification, System Protection, etc.
5. Involve students in a practical power systems operations, control and security issues through the term project implementing intelligent systems.

Course topics:

- Review of Power System Operation Study Topics
- Artificial Neural Networks and implementation to several operations studies.
- Genetic Algorithms and implementation to a number of operations studies.
- Fuzzy Logic and decision making in system operations
- Expert Systems and Alarm Processing
- Projects in:
 - Load Forecasting
 - Economic Dispatch
 - Environmental dispatch
 - Unit commitment.
 - Security Assessment
 - Alarm Processing
 - State Estimation
 - Control
 - Deregulation
 - Other issues

References:

Appropriate lists and copies of technical papers will be distributed or listed for your collection. A list of recent text-books and other technical record will be suggested to you. However, you are also required to research and obtained other pertinent materials related to the topics covered.

ASSISTANCE: Please try to see Dr. Mohammed during his listed office hours or through the communication forum on the web page. If this proves impossible, a personal appointment should arranged by calling my direct phone number or the ECE department secretary at extension (305-348-2807).

ABSENCE: Class attendance (physical or virtual) is very important and is considered in your overall performance in the course. Students are responsible for all material covered in that class.

IMPORTANT RULE: Students are encouraged to discuss the course topics with the professor and with each other. Any work submitted (Homework, Tests, projects, etc.) should be pledged and signed as the students' own work, and that there is no any unauthorized help was obtained. Violators will be subject to academic misconduct, which might lead to dismissal from the university.

Homework & Projects	30%
Mid-term	30%
Final Exam	40%
Total	100%

TERM PROJECT:

A good practical experience: During the semester you will be assigned a project based on a proposal submitted by the student. The project will involve the analysis of an actual system. The project should involve analyzing practical systems by an AI technique for the creation of the decision making process. Final presentation (oral and written) of the overall project results will be required. Software and/or laboratory hardware is available in the lab for this class can be utilized for the projects.

Term Project Report:

All students will be required to write technical reports as articles for possible submission to an IEEE conference. Significant developments in the project are required from doctoral students which result in a possible submission for a journal.