ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT
CLEMSON UNIVERSITY
ECE 8620

REAL-TIME COMPUTER APPLICATIONS IN POWER SYSTEMS

INSTRUCTOR: Dr. G. Kumar Venayagamoorthy
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CLASS TIME: Mondays: 2.00 pm to 5 pm
CLASSROOM: 310 Watt Innovation Center
OFFICE HOURS: Mondays: 9.00 am – 10.00 am or by appointment. Email is the best way to contact me.

EMAIL COMMUNICATIONS: When you send me an e-mail message, use a descriptive subject line that starts with the course identifier (“ECE8260”). This can significantly reduce the response time of the reply. If you do not receive a response with 48 hours, resend the message. It may have been caught in a spam filter.

COURSE OBJECTIVES: The objectives of this course is to explore and develop a knowledge of the power engineering and economic aspects involved in operational planning, and real-time operation and control of power generation and transmission systems in electric utilities.

COURSE CONTENTS:
- Concepts of Energy Control Centers
- Synchrophasors – Phasor Measurement Units
- Load Frequency and Automatic Generation Control
- Demand Forecasting
- Unit Commitment
- Open Access Strategies and Impact of Deregulation on Power System Operations and Control
- State Estimation in Power Systems
- Power System Security
- Optimal Power Flow
- Wide Area Monitoring for Control and Protection


REFERENCES:
1. Papers from IEEExplore and Sciencedirect databases.
2. Additional material will be handed out in class by the instructor.

GRADING:
Class participation 20%
Assignments: 20%
Tests (two, can include quizzes): 20%
Final Exam: 20%
Project: 20%

Above 90% - A; 80-90% - B; 65-79% - C; & Below 65% - F.
All disputes about an evaluation of any graded work during the semester must be submitted in writing (typed, not handwritten) within one week after an assignment, test or project has been distributed to students in the class. Any grade challenges must provide specific justifications for why the grade would be changed.

**ATTENDANCE:**

Regular class attendance and participation in discussions is expected with attendance taken as iROAR requires entry of student’s last date of class attendance. Students are responsible for all material covered and assigned readings during the semester. If you anticipate not being able to attend a class for a particular reason, please e-mail me with the information (before the class to be missed). The optimal classroom learning experience depends on both a professional teaching environment and student participation.

**CLASS PARTICIPATION:**

Class participation is critical to the learning process. The optimal classroom learning experience depends on both a professional teaching environment and student participation. You need to prepare prior to coming each class. Preparation includes having read the required materials or completed the expected assignments/homeworks. Class discussions are critical to learning and everyone in the class is expected to contribute. If you are not prepared you will weigh down the rest of the class besides losing class participation points.

**ASSIGNMENT/POST/HOMWORK:**

It is anticipated that there will be at least five assignments and no more than ten.

All course submissions shall be submitted using Canvas no later than **11.55 pm of the posted due date**. No late submissions beyond a day will be accepted. Late submissions require approval of the instructor and may be subjected to a 50% loss of points.

Any homework assigned will not be required for submission but they are mandatory readings. Quizzes and class discussions may be based on homework (missed quizzes will have no make-ups).

**TESTS AND FINAL EXAM:**

Absence from the tests/final exam will be excused only for medical reasons or serious immediate family problems. A student who anticipates missing a test/exam for legitimate university or professional activities shall discuss with the instructor at least one week prior and set up an alternative arrangement to have test taken before the intended date.

**PROJECT WORK:**

The projects will require written reports (in IEEE PES paper format) consisting of the following items:

- Title
- Abstract
- Introduction and motivation to the project topic with references
- Development of applied theory
- Description (algorithm, flowchart) and implementation of the computer program
- Results and discussions
- Summary (including future work)

**TEST/FINAL EXAM DATES (*tentative days):**
*First Test*: February 19th, 2018, class time
*Second Test*: April 2nd, class time
**Final Examination**: May 3rd, 2018, Thursday, 3.00 pm to 5.30 pm

**ACADEMIC INTEGRITY**:  
The following is Clemson’s official statement on academic integrity:

“As members of the Clemson University community, we have inherited Thomas Green Clemson’s vision of this institution as a ‘high seminary of learning.’ Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form. In instances where academic standards may have been compromised, Clemson University has a responsibility to respond appropriately and expeditiously to charges of violations of academic integrity.”

Please refer to the graduate academic integrity policy, approved March 26, 2007 by the Provost’s Advisory Council, at [http://gradspace.editme.com/AcademicGrievancePolicyandProcedures#integritypolicy](http://gradspace.editme.com/AcademicGrievancePolicyandProcedures#integritypolicy).

Each student should read this policy annually to be apprised of this critical information.

**STUDENTS WITH DISABILITIES**:  
“It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities. Students are encouraged to contact Student Disability Services to discuss their individual needs for accommodation.” Any student with an official Clemson University recognized learning disability must inform the instructor within the first week of class meetings so that arrangements can be made to meet the student’s needs. Details on policies and procedures are available at [www.clemson.edu/sds](http://www.clemson.edu/sds).

**CLEMSON UNIVERSITY TITLE IX STATEMENT**  
The Clemson University Title IX (Sexual Harassment) statement: Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran’s status, genetic information or protected activity (e.g., opposition to prohibited discrimination or participation in any complaint process, etc.) in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. The policy is located at [http://www.clemson.edu/campus-life/campus-services/access/non-discrimination-policy.html](http://www.clemson.edu/campus-life/campus-services/access/non-discrimination-policy.html). Jerry Knighton serves as Clemson’s Title IX coordinator and he may be reached at knightl@clemson.edu or 656-3181.

**COPYRIGHT STATEMENT**:  
Materials in some of the courses are copyrighted. They are intended for use only by students registered and enrolled in a particular course and only for instructional activities associated with and for the duration of the course. They may not be retained in another medium or disseminated further. They are provided in compliance with the provisions of the Tech Act. Students should be reminded to refer to the Use of Copyrighted Materials and “Fair Use Guidelines” policy on the Clemson University website. Additional information is detailed at [http://libguides.clemson.edu/copyright](http://libguides.clemson.edu/copyright).

**PREFERRED NAME POLICY**: Fostering an environment of inclusion is one of the major goals of Clemson University’s new strategic plan, ClemsonForward. Some of the most important elements of inclusion are the ways we interact with one another every day. To help foster interactions that support this goal, Clemson has approved a “Preferred Name Policy”. Simply put, it is now Clemson’s official policy that we all, as members of the Clemson Family, address one another using preferred names (i.e., the name an individual prefers to use even if different from his or her legal name). I therefore request you inform me of your preferred name if different than what I have in my records.
FINAL CONSIDERATIONS:

Learning:
At the end of the day it is how much you have learned from this course that matters. You are advised to be active course participant so that you will receive feedback to assist you with your learning and maximize your throughput.

Changes:
Any portion of this syllabus may be changed during the semester by the instructor as needed. You will be notified as soon as possible.

Agreement:
If you disagree with any of the policies or procedures stated above or cannot accommodate the time and work requirements of the course, you need to drop the course as soon as possible. By continuing, you agree to comply with all the policies and procedures described in the course syllabus.

EMERGENCY PROCEDURES:
Emergency procedures have been posted in all buildings and on all elevators. Students should review these procedures for their own safety on a regular basis and be aware of them at all times.

Last updated: January 22, 2018