

## ELEG 5523 – Electric Power Quality

Fall 2017

TIME: **Online** VENUE: N/A

TEXTBOOK: **Electrical Power System Quality**, Third Edition by Dugan, McGranaghan, Santoso and Beaty. (McGraw Hil, 2012, ISBN: 978-0-07-176156-7)

Optional: **Fundamentals of Electric Power Quality** by Surya Santoso. (ISBN 978-1440491023)

INSTRUCTOR: **Dr. J. C. BALDA (3171 or 3218 Bell Engineering Center, Tel: (479) 575-3009, Fax: (479) 575-7967, e-mail: jbalda@uark.edu)**

OFFICE HOURS: **Emails sent to Dr. Balda's account**

### 1.0 COURSE OUTLINE

1. Introduction to Electric Power Quality
2. Power Electronics Background
3. Wiring and Grounding
4. Voltage Sags and Interruptions
5. Harmonics
6. Distributed Generation and Power Electronic Systems
7. Power Quality Benchmarking
8. Instrumentation and PQ Analyzers
9. Transients

### 2.0 GRADING POLICY

3 Tests 70%

Homework Problems 30%

The first test covers items 1 to 3, the second test covers items 4 to 5, and the third test covers items 6 to 9.

Grading system:  $A \geq 90$ ,  $90 > B \geq 80$ ;  $80 > C \geq 70$ ;  $70 > D \geq 50$

Cutting a test will result in a zero grade; i.e., THERE IS NO MAKE UP TEST UNDER ANY CIRCUMSTANCE. A formula sheet with only numbered equations from the textbook is allowed in each test. Drawings, equivalent circuits, solved problems ARE NOT ALLOWED on the formula sheet; failure to satisfy this will be considered academic dishonesty. As written in the UA Academic Integrity website, "As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail. Each University of Arkansas student is required to be familiar with and abide by the University's 'Academic Integrity Policy' which may be found at "provost.uark.edu/457.php". A short video is at

[http://www.youtube.com/watch?v=SQW\\_IoOhjvo&feature=youtu.be](http://www.youtube.com/watch?v=SQW_IoOhjvo&feature=youtu.be)

Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor." Please, refer to [www.ieee.org/about/whatis/code.html](http://www.ieee.org/about/whatis/code.html) for the IEEE Code of Ethics.

### 3.0 ATTENDANCE POLICY

Attendance is voluntary; each student is responsible for the information presented during each class meeting.

### 4.0 GENERAL

Students are advised to make use of the Dr. Balda's office hours in order to reinforce any concept that may not be clear independently of their grades.

Any of the above rules may be changed at any time if the circumstances warrant doing so.

Session ends on October 11, 2016.

Please, email me your proctor name and email. Proctors will receive the tests 2 or 3 days ahead of the dates indicated before.

#### 5.0 EMERGENCY PROCEDURES

Many types of emergencies can occur on campus; instructions for specific emergencies such as severe weather, active shooter, or fire can be found at [emergency.uark.edu](http://emergency.uark.edu).

##### **Severe Weather (Tornado Warning):**

- Follow the directions of the instructor or emergency personnel
- Seek shelter in the basement or interior room or hallway on the lowest floor, putting as many walls as possible between you and the outside
- If you are in a multi-story building, and you cannot get to the lowest floor, pick a hallway in the center of the building
- Stay in the center of the room, away from exterior walls, windows, and doors

##### **Violence / Active Shooter (CADD):**

- **CALL-** 9-1-1
- **AVOID-** If possible, self-evacuate to a safe area outside the building. Follow directions of police officers.
- **DENY-** Barricade the door with desk, chairs, bookcases or any items. Move to a place inside the room where you are not visible. Turn off the lights and remain quiet. Remain there until told by police it's safe.
- **DEFEND-** Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others from attack.

#### 6.0 GUIDE TO RECORDED LECTURES

- You should be watching one lecture per day to keep up with the class.
- The tentative dates for the tests also provide the lectures covering the material in a particular test.
- You must make use of the pdf files and the textbook. The pdf files are based on the material in the textbook but complemented with additional material when necessary.

## **ELEG 5523 – FALL 2017 8W1**

**August 21 to October 10 2017**

### **Relevant Tentative Dates for Homework Assignments and Tests**

The lectures that you are watching were taped in the spring 2017, so the dates referred to the taping of a lecture are for the spring 2017.

#### Homework Assignment Tentative Deadlines

- The first homework assignment dealing with modeling a source is due on Friday August 25 2017.
- The first homework assignment for voltage sags is due on Friday September 1 2017.
- The second homework assignment on voltage sags is due on Friday September 8 2017.
- The first homework assignment on harmonics is due on Tuesday September 12 2017.
- The second homework assignment on harmonics is due on Friday September 15 2017.
- The third homework assignment on harmonics is due on Wednesday September 20 2017.

#### Test Tentative Deadlines

You need to schedule the tests with your proctor within the dates given below; the actual date and time will depend on your time availability and that of your proctor. Tests are closed book and closed notes; you can have a formula sheet with ONLY equations from the textbook or class notes. No solved problems, no graphs, nothing except equations. You can have reasonable extra time for the tests which are set to last 75 minutes. If you think that you may need extra time, do not schedule your test 75 minutes before the testing center closes for the day. The tentative dates are the following:

- Test 1 covers from the lecture taped on January 17 2017 to the beginning of the lecture taped on January 24 2017.  
**This test should be taken between August 30 and 31, 2017.**
- Test 2 covers from the lecture taped on January 26 2017 to the beginning of the lecture taped on March 30 2017.  
**This test should be taken between September 26 and 27, 2017.**
- Test 3 covers from the remainder of the lecture taped on April 6 2017 to May 4 2017.  
**This test should be taken between October 9 and 10, 2017.**