COURSE TITLE: **ENGR 202 Electrical Fundamentals II: AC Circuits**

CREDITS: **4**

ROOM: **(Online)**

CRN: **42892**

LECTURE/RECITATION: **(Pre Recorded Lectures Online)**

LABS: **(Pre Recorded Labs Online)**

INSTRUCTOR: **Craig Munsee**

EMAIL: **munseec@linnbenton.edu**

OFFICE: **IA-206**

OFFICE HOURS: **(Zoom Meeting)**
Monday 2:00 pm - 2:50 pm
Tuesday 2:00 pm - 2:50 pm
Wednesday 2:00 pm - 2:50 pm
Friday 2:00 pm - 2:50 pm
Others by Appointment

Course Description:
Covers AC circuit analysis techniques; covers sinusoidal steady state and analysis of three-phase circuits; introduces mutual inductance and transformers; looks at resonant circuits; investigates filters and continues to look at op-amp circuits.

Prerequisite(s):

Prerequisite: ENGR 201 Electrical Fundamentals: DC Circuits with a grade of C or better.

Course Outcomes:
Upon successful completion of this course, students will be able to:
1. State how Ohm's law, Kirchhoff's laws, Thevenin's theorem and Norton's theorem as modified for the analysis of ac circuits.
2. Apply the concepts of frequency-dependent impedance to solve problems involving inductive and capacitive components and the relationships between voltage, current, power and power factor in ac circuits.
3. State and apply circuit analysis laws and theorems to single-phase ac circuits using phasors to calculate power, apparent power and reactive power.
4. Apply circuit analysis laws and theorems to both balanced and unbalanced three-phase circuits to calculate line- and phase-voltage, line- and phase-current, power and energy.
5. State and apply Faraday's law to both single-phase and three-phase circuits.
6. Solve problems involving self- and mutual- inductance, inductive voltage division and multiplication, and the principle of transformers.
7. Apply the principles of frequency dependence of inductive and capacitive components to analyze passive and active filters.

Text Book:
Alexander, Charles. K., **Fundamentals of Electric Circuits**, (3rd, 4th, 5th, or 6th Edition), McGraw-Hill. **This same text will be used for ENGR 202 and ENGR 203.** Copies of the text are on reserve in the library and can be checked out for two hours at a time.

Course Topics:

Chapter 9:	Sinusoids and Phasors
Chapter 10:	Sinusoidal Stead-State Analysis
Chapter 11:	AC Power Analysis
Chapter 12:	Three-Phase Circuits
Chapter 13:	Magnetically Coupled Circuits
Chapter 14:	Frequency Response

Grading:

Assignment:	Number:	Percentage:
Homework (best 8 of 9)	9	20%
Labs	6	20%
Midterms	2	40%
Final Exam	1	20%
Total		**100%**

90-100% A, 80-89.9% B, 70-79.9% C, 60-69.9% D, < 59.9% F

Homework:
Homework problem sets are linked in Moodle and will be turned in by 11:55 PM on the day they are due. Homework is to be scanned to a PDF and turned in to Moodle. **Late homework will not be accepted unless prior arrangements have been made with the instructor.** Each problem will be checked for a reasonable attempt at solving. The lowest weekly homework score will be dropped. Solutions to the homework problems will be posted in Moodle after the homework is due. **The Student is responsible for turning the homework in on time and in the recommended format. They are responsible for turning in all of the pages and putting them in the correct order. They are also responsible for turning in the correct homework.**

Exams:
Exam I: (**Thursday April 24, 2020, at 3:00 – 6:00 pm**)
Exam II: (**Thursday May 15, 2020, at 3:00 – 6:00 pm**)
Final Exam (**Thursday June 11, 2020, at 3:00 – 6:00 pm**)

The exams will be online timed tests and will only be given on the day and time indicated above. You will also be given a link where you will need to submit your work for partial credit. To get full credit, a correct answer will need supporting work to be included.

If you have a time conflict for the test, you will need to contact your instructor to arrange for a different time.

Labs:
Each lab report will be graded on conformance with specific criteria, which will be reviewed during the first week's lab session. Lab reports are due for grading at the beginning of the next lab, with dates indicated in Moodle. Late lab reports will lose 10% per day for each day the report is late.

Links to the experimental procedures can be found in Moodle and should be reviewed carefully before coming to lab.

Computer Requirements:
You will need a computer capable of running LTspice. There is a Windows and Mac version for this avalabe, but the Mac version is difficult to work with. If you wish to use the Mac version, you will need to use the internet to learn how the use the features we will be using in the labs. If you would like to use the Windows version on your Mac, a windows environment would need to be installed on the computer to run the software (VMware Fusion 10).

Holidays:
Memorial Day: LBCC will be closed (**Monday May 25, 2020**)

Course Evaluations:
Student feedback is important to improve this course and to help the instructor know how to adjust teaching methods. Your feedback is taken seriously and does influence future versions of the course. The Student Evaluations of Teaching (SETs) are anonymous, and links to the evaluations will be emailed to your student email account after the 5th week of the term. I encourage you take this opportunity to provide constructive feedback on the class. Thank you in advance for your input!

Academic Integrity:
You may work together and discuss your homework with your classmates, but you are expected to turn in your own work. If you turn in something that is not your work, it is considered cheating (This includes copying and sharing computer files). **Those caught cheating and those who aid them will receive a score of zero for that assignment or test and will be reported to the Dean of Students.**

Drop/Withdraw Policy:
If you are withdrawing from the class you must file a Schedule Change Form with Registration or use WebRunner. If you formally drop the class **before Monday of the second week of the term**, you will receive a tuition refund. If you withdraw after the Monday of the second week of instruction through the seventh week a **'W'** will show up on your transcript. **No withdrawals are allowed after the end of the seventh week**. An instructor may not assign a "W" grade.

If you received financial aid or veteran's benefits, PLEASE talk with associates at the appropriate office to determine what effects on eligibility dropping a course will have. Don't jeopardize your eligibility!! You can contact the Financial Aid Office by calling (541) 917-4850 or by visiting the Financial Aid Office in Takena Hall.

If you stop attending the course without formally withdrawing you will continue to accumulate grades (zeroes for all assignments not turned in) and will receive the grade assigned by the instructor. You will also be held accountable for all charges on your account.

College Policies

Center for Accessibility Resources (CFAR):
You should meet with your instructor during the first week of class if:

1. You have a documented disability and need accommodations.
2. Your instructor needs to know medical information about you.
3. You need special arrangements in the event of an emergency.

If you have documented your disability, remember that you must make your request for accommodations through the Center for Accessibility Resources Online Services web page every term in order to receive accommodations. If you believe you may need accommodations but are not yet registered with CFAR, please visit the CFAR website at http://www.linnbenton.edu/cfar for steps on how to apply for services or call 541-917-4789.

LBCC Comprehensive Statement of Nondiscrimination
LBCC prohibits unlawful discrimination based on race, color, religion, ethnicity, use of native language, national origin, sex, sexual orientation, gender, gender identity, marital status, disability, veteran status, age, or any other status protected under applicable federal, state, or local laws. For further information see Board Policy P1015 in our Board Policies and Administrative Rules. Title II, IX, & Section 504: Scott Rolen, CC-108, 541-917-4425; Lynne Cox, T-107B, 541-917-4806, LBCC, Albany, Oregon. To report: linnbenton-advocate.symplicity.com/public report.

Know your rights and responsibilities:
LBCC students have rights: the right to free speech, the right to assemble, the right of a free press, etc. LBCC students also have responsibilities to their community: the responsibility to participate and engage in class, the responsibility to advocate for their needs (ask for help), the responsibility to support a respectful teaching and learning environment, the responsibility to treat all persons with respect, the responsibility to be truthful and honest in all work and communications, and the responsibility to follow staff directions, local, state, and federal laws.

Rights and responsibilities balance together to create the best learning environment. For example, while you have free speech in the café or courtyard, in class the instructor decides whose turn it is to talk and what the topics for conversation will be. Students are free to believe what they believe, but instructors may require students to learn and recite concepts, principles, or theories for a class even if the student does not believe those concepts. You play a role in creating a positive community at LBCC.

Please review your rights and responsibilities (http://linnbenton.edu/go/studentrights).
If you believe a student is violating your rights, ask to be treated with respect. If that does not cure the situation, report to Associate Dean Dr. Lynne Cox, Takena Hall Rm. 107. If you believe a faculty member or LBCC employee is violating your rights, please report to Human Resources, Scott Rolen, Calapooia Center Rm. 108.

Changes to the Syllabus
I reserve the right to change the contents of this syllabus due to unforeseen circumstances. You will be given notice of relevant changes in class, or through LBCC e-mail.