

ELT 220

LINEAR INTEGRATED CIRCUITS

5 cr. (3-4)

**COURSE DESCRIPTION:**

This course will introduce the student to applications of various devices covered in digital and solid states, such as switching and sensing devices. Various industrial power systems and equipment, such as load centers and motor and control circuits, will be covered.

**PREREQUISITES:**

ELT 110 or consent of instructor

**COURSE OBJECTIVES:**

Upon completion of this course the student will be able to:

1. Analyze, and construct a discrete differential amplifier.
2. Analyze, construct, and troubleshoot the following circuits using the 741 op-amp:
  - a. non-inverting amplifier
  - b. inverting amplifier
  - c. integrator
  - d. differentiator
  - e. comparators
  - f. summing amp
  - g. differencing amp
  - h. instrumentation amp
  - i. averaging amp
  - j. active filters
3. Analyze, construct, and troubleshoot the following circuits using the CDA:
  - a. inverting amp
  - b. non-inverting amp
  - c. comparators
4. Analyze, construct, and troubleshoot the following circuits using the OTA:
  - a. inverting amp
  - b. non-inverting amp
  - c. amplitude modulation
  - d. automatic gain control
5. Analyze, construct, and troubleshoot circuits using the following electronic timers:
  - a. 555 timer
    - 1) one shot
    - 2) bistable multivibrator
  - b. 565 VCO
    - 1) oscillator
    - 2) frequency modulator
6. Analyze, construct, and troubleshoot circuits using the following demodulators:
  - a. 566 PLL
  - b. 567 TTD
  - c. 2907/2917 linear frequency to voltage converter

**COURSE OUTLINE:**

1. 741 Op-amp
  - a. non-inverting amplifier
  - b. inverting amplifier
  - c. integrator
  - d. differentiator
  - e. comparators
  - f. summing amp
  - g. differencing amp
  - h. instrumentation amp
  - i. averaging amp
  - j. active filters
2. CDA
  - a. inverting amp
  - b. non-inverting amp
  - c. comparators
3. OTA
  - a. inverting amp
  - b. non-inverting amp
  - c. amplitude modulation
  - d. automatic gain control
4. Electronic timers
  - a. 555 timer
    - 1) one shot
    - 2) bistable multivibrator
5. Frequency-to-voltage converters
  - a. 566 PLL
  - b. 567 TTD
  - c. 2907-2917 linear frequency to voltage converter

**COURSE REQUIREMENTS:**

1. Tests will comprise 80% of the final grade.
2. Lab projects will comprise 20% of the final grade.
3. All tests, except the final, will be 100 pts.
4. All tests will be comprehensive to include the final.
5. The final exam will count 200 pts.
6. All homework and quizzes will be added to the total possible points.
7. All assigned labs must be complete and included in a portfolio in order to receive a passing grade. Without prior arrangements, no missed tests will be made up. The low test score will be dropped.
8. All students will be required to purchase a number of electronic components. The purchase of the components will be integrated into a class activity to familiarize students with the process of selecting and purchasing electronic components to perform specific tasks.

**Student Success Center.** Tutors may be obtained through the Student Success Center. Contact the staff in C219 if this service is desired. John A. Logan College will make reasonable accommodations for students with documented disabilities under Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act of 1990. Any student with a disability that may have some impact on work in this class, who feels she/he needs an accommodation, should make an appointment with the Coordinator of Services for Students with Disabilities on campus, Christy McBride, room C219, extension 8516. Before services can be provided, this advisor must determine eligibility and arrange appropriate academic adjustments. **It is the student's responsibility to register in advance of a school term with this office and to turn in a schedule each term to ensure that there is every opportunity for success in this class.**

**English Writing Center/Tutoring:** For assistance with writing assignments in any college courses, students are encouraged to visit "The Write Place" in E109. English instructors are available for one-on-one tutoring each semester during hours posted at the center.

**Financial Aid.** Students who receive financial assistance and completely withdraw from classes prior to 60% of the semester being completed (approximately 2-3 weeks after midterm) could be responsible to return a portion of their Federal Pell Grant award. Prior to withdrawing from courses, students should contact the Financial Aid Office.

### **METHOD OF EVALUATION:**

Grading:                    93 - 100 = A  
                                   86 - 92 = B  
                                   73 - 85 = C  
                                   70 - 72 = D  
                                   69 or less will receive a failing grade

### **METHOD OF PRESENTATION:**

The course will be taught in a lecture, lab format.

**TEXT:**                    None

**INSTRUCTOR:**        Andrew Knepler

**DATE:**                    Fall, 2005

### **John A. Logan College Telephone Numbers:**

Cartersville and Williamson County .....985-3741 (operator)  
 985-2828 (direct extension access)  
 Carbondale and Jackson County.....549-7335 (operator)  
 457-7676 (direct extension access)  
 Du Quoin..... 542-8612  
 West Frankfort ..... 937-3438  
 Crab Orchard, Gorham, & Trico areas..... 1-800-851-4720  
 TTY (hearing-impaired access)..... 985-2752

**John A. Logan College does not discriminate on the basis of race, religion, color, national origin, disability, age, or gender.**