



### **Academic Integrity**

Students are required to perform all the work specified by the faculty and are responsible for the content and integrity of all academic work submitted, such as papers, reports, and examinations. A student will be guilty of violating the Rule of Academic Integrity if he or she:

- knowingly represents the work of others as his or her own;
- uses or obtains unauthorized assistance in any academic work;
- gives fraudulent assistance to another student.

### **Temporary Grade Policy**

If you do not complete the course requirements by the end of the semester, and you have a prior agreement with the instructor, you may be given an INC (incomplete). INC indicates that the instructor is affording extra time to earn a grade in the course. The amount of extra time is determined by the instructor, up to a maximum of 16 calendar weeks after grades are submitted. A INC grade which has not been resolved within 16 calendar weeks is changed to an F or NC (no credit) grade, as appropriate to the course.

### **Letter Grades**

Letter grades have the following quality point values: A=4, B=3, C=2, D=1, and F=0. Other grades do not count in the quality point average.

### **Audit**

If you audit the course, you will receive an “AU” grade—this cannot be changed to a letter grade.

### **Withdrawal Course Requirements**

To receive a W grade for any course, a student must consult with the course instructor or an appropriate division representative and then withdraw officially before two-thirds of the course has been completed by submitting a withdrawal form to the Office of Student Records. Withdrawal after this point results in a grade other than W (usually F). At any time before two-thirds of the course has been completed, the instructor may also withdraw with a W grade any student who has been absent excessively. A student thus withdrawn will not be entitled to any refund of tuition or fees. The student may appeal this action.

## **GENERAL OBJECTIVES**

Students will gain:

1. An understanding of linear integrated circuits such as the 741 OP-AMP, 311 Comparator, and 555 timer.
2. An understanding of the design requirements for inverting and noninverting amplifiers, diff. amps, and comparators.
3. An understanding of DC & AC limitations of OP-AMPS.
4. An understanding of the design procedure for pulse stretchers and pulse oscillators.

## **GRADING**

The final grade will be based on lecture test grades averaged with a lab grade.

There will be no make-up tests.

To earn an	A	your average must be	> 92
	B	"	> 83
	C		> 74
	D		> 65

On the following pages are the lecture topics for each week. Also shown are the chapters in the textbook which you are responsible for studying. The outline will list the problems which you are expected to be able to do. The test questions will be very similar to these so that if you do the homework you should be able to pass the course. In addition, each test will have one or more questions which will be challenging for "A" level students.

Lab Grade: The lab grade will be determined from lab experiments over the first ten weeks and a lab report based on a pulse width modulated temperature controller. This controller will be built over the last five weeks of the semester.

WEEK	TOPICS	CHAP/SECT	HW
1	<b>Introduction to Linear I.C.</b>	1.1 to 1.6	
	a. Monolithic - hybrid	2.0 to 2.1	1 to 4
	b. Arrays (transistors, diodes, resistors)		
	c. Ideal Op-Amp, Diff. Amp, push-pull output		
2	<b>Simple Op-Amp Circuits</b>	2.2 to 2.5	5 to 9
	a. Non-ideal Op-Amp		
	b. Voltage level detectors		
3	<b>Op-Amp Applications</b>	2.6 to 2.8	10 to 16
4	<b>Inverting Amplifier</b>	3.0 to 3.4	1 to 8
	a. Summing Amplifier/Inverting Adder		
	b. Inverter		
5	<b>Noninverting Amplifier</b>	3.5 to 3.10	8 to 17

### TEST ONE

6 & 7	<b>Comparators with Feedback</b>	4.0 to 4.5	1 to 8
	a. Upper and Lower Trip points		
	b. Transfer function		
	c. Hysteresis		
8 & 9	<b>Comparator Applications</b>	4.6 to 4.10	9 to 15
	a. Controllers		
	b. Precision Comparators		
	c. Window Detector		
10	<b>Op-Amp Applications</b>	5.0 to 5.10	1 to 19
	a. Voltage Measurement		23, 24
	b. Current Measurement		
	c. Phase Shifter		
11 & 12	<b>Signal Generators</b>	6.1, 6.3, 6.4	1, 2, 3, 7
	a. Triangle		8, 9, 10
	b. Sawtooth		
	c. Sinewave		
	d. Voltage to Frequency Converters		

### TEST TWO

<b>13</b>	<b>Differential Amplifier</b> a. Simple Diff. Amp. b. Buffered Diff. Amp. c. Instrumentation Amplifier	8.0 to 8.4	1, 2, 3, 8, 9, 10
<b>14</b>	<b>Op-Amp Limitations (A.C.)</b> a. Band Width b. Slew Rate	10.0 to 10.3	1, 2, 3, 8, 9, 10
<b>15</b>	<b>Integrated Circuit Timers</b> a. 555 Timer b. Applications	13.0 to 13.6	1 to 10

**TEST THREE**