Course No.: INEL 4202 Electronics II 3 Credits August 10, 2010

Pre-requisite: INEL 4201, INEL 4102
Textbook: Microelectronics: Circuit Analysis and Design, Neamen, 3rd ed., McGraw Hill, 2007.

COURSE DESCRIPTION
Study of frequency response, feedback and stability in amplifiers. Analysis and design of multi-stage amplifiers, wave generation and power circuits.

Primary objectives of course:

1. To develop the ability to analyze and design wide band analog multi-stage amplifiers with and without feedback, as well as circuits based on operational amplifiers, active filters, and power amplifiers.

Reference Books:

1. Microelectronic Circuit Design, Jaeger and Blalock, 2nd ed., McGraw Hill, 2004.
2. Engineering Electronics, Robert Mauro, Prentice Hall, 1989

Examinations and Grading:

Three partial examinations and a final examination will be administered during the semester.

Preliminary Schedule

Lesson (Date)	TOPIC	Article	Problems
1 (8/13)	Introduction, frequency response, Bode plots	7.1, 7.2	
2 (8/18)	Bypass and coupling capacitors	7.3 …	7.13, 14, 16, 18, 20, 26, 37
3 (8/20)	BJTs and FET high frequency models	7.4	7.38, 39, 40, 42, 43, 44, 45
4 (8/25)	Common emitter and common source amplifiers, Miller's theorem	7.5, 7.6	7.47, 50, 52, 54
5 (8/27)	Common gate and common base amplifiers	7.6	7.55, 56, 57, 62, 63
6 (9/1)	Common drain and common collector amplifiers	7.6	
7 (9/3)	Multistage amplifiers, Effect of bandwidth on pulse response	7.7, 7.2.4	7.68
8 (9/10)	**REVIEW FOR EXAM I**		
9 (9/15)	Feedback and its effect on gain, bandwidth and distortion; Classes of feedback amplifiers, effect of feedback on input and output impedance	12.1, 12.2, 12.3	12.8, 15, 16, 20, 21, 28
10 (9/17)	Feedback topologies. Analysis of feedback amplifiers with discrete devices	12.4 …	12.34, 35, 36, 37, 38, 40, 44, 46,48
11 (9/22)	Analysis of feedback amplifiers with discrete devices (cont.)	…12.7, 12.8	12.50, 52, 54, 57, 58, 61, 63
12 (9/24)	Stability, gain and phase margins	12.9	12.65, 66, 71, 73,
13 (9/29)	Sinusoidal oscillators, RC oscillators	15.2.1-15.2.3	15.21, 22, 23, 25, 26, 27, 28

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14 (10/1)	LC Sinusoidal oscillators,	15.2.4	15.31, 32, 34, 35, 36
15 (10/6)	LC Sinusoidal oscillators, quartz crystal oscillators		
16 (10/8)	**REVIEW FOR EXAM 2**		
17 (10/13)	Operational amplifiers, Summers, integrators, inverting and non-inverting amplifiers	9.1, 9.2, 9.3, 9.4	9.5, 7, 11, 13, 15, 27, 34, 35, 37, 41, 42, 43, 48, 50
18 (10/15)	Applications	9.5	9.51, 61, 65, 66, 72, 73, 74
19 (10/20)	Current sources	10.1…10.4	10.1, 2, 3, 4, 6, 7, 8, 10, 11, 13, 14, 15, 17, 19, 21, 22, 25, 26, 39, 40, 46, 50, 56
20 (10/22)	The differential amplifier	11.1 … 11.3	11.1, 2, 3, 8, 9, 10, 23, 30, 38, 45, 46, 47
21 (10/27)	DC analysis of the 741 opamp	13.1…	13.3, 4, 6, 8, 10, 12, 13, 14, 17, 20
22 (10/29)	AC analysis of the 741 op-amp	13.2	13.21
23 (11/3)	Frequency response and slew rate		
24 (11/5)	CMOS opamp	13.3 …	13.25, 26, 27,
25 (11/10)	CMOS opamp (cont.)		
26 (11/12)	Frequency response and slew rate of CMOS opamp	… 13.3	13.36
27 (11/17)	**REVIEW FOR EXAM 3**		
28 (11/24)	Amplifier classes (A,B,C) Class A output stages, Class B and AB amplifiers, Class AB amplifiers, biasing	8.3, 8.4, 8.5	8.28, 30, 31,34, 36, 38, 41
29 (12/1)	Power amplifiers	Notes	
30 (12/3)	Power Amplifiers	Notes	

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