

Course name	ECE 55400 Introduction to Electronics Analysis and Design
Credit and contact hours	(3 cr.) Class 3
Course coordinator's name	Maher Rizkalla
Textbook	<i>ECE55400</i> <i>Lecture Notes accessible on CANVAS Course Site at IUPUI</i>
Reference	<i>Electronic Circuit Analysis and Design, Second Edition,</i> <i>Donald A Neamen, McGraw-Hill, 2001</i>
Course information	ECE 55400 Electronic Instrumentation and Control Circuits (3 cr.) P: ECE 25500 and ECE 30100 or Graduate Standing. Class 3. Analysis and design of special amplifiers, pulse circuits, operational circuits, DC amplifiers, and transducers used in instrumentation, control, and computation. Prerequisites/ Co-Requisite ECE 25500 and ECE 30100 or graduate standing Required, Elective, or Selected Elective: EE Elective, CE Elective
Goals for the course	Upon successful completion of the course, students should be able to 1 Study the sag algorithm in the time domain amplifier circuits. [1] 2 Determine parameters compensate for the low frequency limitations of the various MOSFET and BJT configurations. [1, 2] 3 Apply control tools for optimizing the high frequency performance of voltage amplifiers. [1] 4 Determine stability range of high frequency network utilizing wide band transistors. [1] 5 Analyze and design wide band amplifier circuits with input and output compensation. [1, 2] 6 Design amplifiers with base compensated feedback circuitries. [1,2] 7 Design electronic circuits for optimum noise performance. [1,2] 8 Design wide band video amplifiers. [1,2] 9 Apply control tools for optimum design of switching regulators. 10. Use of software tools for wide band stability. [1,6,2]
List of topics to be covered	1. Device reviews and DC and AC amplifier models - One week 2. High frequency amplifiers and the sag algorithms- One week 3. Rise time limitations- One week 4. Applications of control tools in electronics circuits- One week 5. The intrinsic feedback of high frequency devices. - One week 6. High frequency stability, compensation tools, and the use of Linville pla - Two weeks

	7. Algorithm of high frequency stability- One week 8. Noise in electronic circuits and optimization techniques- Two weeks 9. Feed back in analog design- Two weeks 10. Video amplifier design- One week 11. Switching regulators- Two weeks One week for Midterm exam
Syllabi approved by	Maher Rizkalla
Date of approval	04/22/2021