

Department of Electrical Engineering			
Electronic Circuits III (63412)			
Total Credits	3		
major compulsory			
Prerequisites	P1 : Electronic Circuits II (63313) OR Electronic Circuits II (63363)		
Course Contents			
General Frequency response of transistor amplifier. Concept of bode plots, Effects of coupling capacitors on the transistor amplifier frequency (low) response, High frequent transistor model. Hfe variation with frequency, Cascade and Cascode amplifiers, Miller effect, Feedback amplifiers types and analysis. Stability of feedback amplifiers , oscillators, Op-Amps Circuits and Applications :Frequency response of Op-Amp Circuits and methods of compensation			
Intended Learning Outcomes (ILO's)		Student Outcomes (SO's)	Contribution
1	How the transistor respond to low and high signal frequencies	E	30 %
2	How to analyze negative feedback amplifiers	E	30 %
3	The stability criteria for amplifiers and freq compensation methods	E	20 %
4	The concept of oscillation and type oscillators	E	15 %
5	Introduction to phase locked loops	E	5 %
Textbook and/ or References			
Microelectronic Circuits , Sedra / Smith , Integrated electronics , Millman-Halkias , Electronics III , Class lecture notes Mazen Rasekh			
Assessment Criteria		Percent (%)	
First Exam		20 %	
Second Exam		20 %	
Homeworks		10 %	
Final Exam		50 %	
Course Plan			
Week	Topic		
1	General Frequency response of transistor amplifier, Low and High Cutoff frequencies / definitions and significance ,Decibels concepts and Bodes Plots		
2	Effects of coupling capacitors on the transistor amplifier frequency (low) response (coupling cap. Acting alone)		
3	Interaction effect of capacitors in amplifier circuit on the overall response of the amplifier (all capacitors acting together)/ Expression of V_{out}/ V_{in} in S-notation, solved examples		
4	High frequent transistor model , BJT Forward current gain variation with respect to frequency , deriving formulae for hfe cutoff frequency interns of bias conditions		
5	Cascade and cascode amplifiers / calculation of the combined circuit cut-off frequencies , solved examples		
6	Tutorials and First Exam		
7	Miller capacitances and their influence on the frequency response of amplifiers , the case for using composite transistor configurations to reduce miller effect		
8	Concepts of feedback and Feedback Amplifiers ,Negative and Positive feedback		
9	Configurations (types) of negative Feedback ,Gain Response of an amplifier with negative feedback		
10	General Methods of analysis of feedback amplifiers Transistor Circuit Z_i and Z_{out} (with		

	feedback) calculations
11	Tutorial and second Exam
12	Practical feedback circuits Stability condition of circuits with feedback
13	Niquist Plot ,Concepts of Oscillation in Transistor Circuits
14	Theory of oscillators , wien bridge , collpits and heartly , xtal oscillators
15	Frequency Compensation techniques (Op-Amp circuits), solved examples
16	Final Exam