A	B	C	D	E	F	G	H	I	J	K	Rubric or student %	Example problem	Outcome #	**B C E** — EE 332 Electronic Circuits and Devices (3) – Outcomes Reviewed 2013
1		2		2	1					1		E1	1	Study of IC Operational Amplifiers, its design in different configuration, and application. Design and simulation of IC operational amplifier circuit using SPICE.
1		2											2	Demonstrate knowledge of solid state device parameters, specifications and performance characteristics for diodes, bipolar junction transistors (BJT) and MOS field effect transistors (MOSFET).
		2						1		1			3	Utilize SPICE simulation to model diode characteristics for a simple limiter or clamping circuit. Design of full wave rectifier circuit.
		2						1		1			4	Apply BJTs, MOSFETs to electronic circuits, and analyze the circuit performance (including various currents, voltages, power, gain, bandwidth, frequency response characteristics, efficiency). Utilize SPICE to model BJT and MOSFET. Design and SPICE simulation of amplifier circuits using BJTs and MOSFETs.
1		2						1		1		C1	5	Demonstrate knowledge of the concept of electronic amplification, the differences between small signal and large signal (power) amplifier design constraints and the AC and DC analysis of differential and multistage amplifiers using BJT, MOSFET, and with active load.
		2						1		1			6	Utilize SPICE model for difference amplifier and SPICE simulation of difference amplifier.
1		2			1			1		1		C2	7	Demonstrate knowledge of the different performance capabilities for various amplifier classes (A,B,C) in small and large signal amplifier applications. Class A, Class B, and Class AB output stages analysis and design. Design and simulation of output stages and power amplifier using SPICE.
1	2	2			1							B2	8	Demonstrate knowledge of the importance and stability factors that must be considered in the design of small signal and large signal amplifier DC bias circuits.
1	2	2			1			1		1		B1	9	Analyze and design multistage amplifiers with gains, frequency response, efficiency, and impedance specified.

1=supporting contribution
2=significant contribution

Rubric	
	a. an ability to apply knowledge of mathematics, science, and engineering
	b. an ability to design and conduct experiments, as well as to analyze and interpret data
5: Excellent Mastery of Outcome By Vast Majority of Students	c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
4: Good Mastery of Outcome By Vast Majority of Students	d. an ability to function on multi-disciplinary teams
3: Adequate Mastery of Outcome By Majority of Students	e. an ability to identify, formulate, and solve engineering problems
2: Marginal Mastery of Outcome By Most Students	f. an understanding of professional and ethical responsibility
1: Lack of Mastery of Concept By Most Students	g. an ability to communicate effectively

Improvement Suggestions or Comments:

h. the broad education necessary to understand the impact of engineering solution in a global, economic, environmental, and societal context

i. a recognition of the need for, and an ability to engage in life-long learning

j. a knowledge of contemporary issues

k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice