Table 3-2. Matrix of contribution of courses to BE educational objectives and outcomes.

Objectives	1. Fundamentals of engineering			2. Design, manufacture, evaluate, and/or operate systems			3. Function in modern society as a professional engineer					
Outcomes	a. solve a problem with differential equations.	b. solve a problem involving: physics; inorganic and organic chemistry; and/or general and micro- biology.	c. solve an engineering problem involving statics, dynamics, fluid mechanics, and thermodynamics	d. design a system, component, or process in which biology plays a significant role.	e. design and conduct experiments to gather information for engineering designs	f. use modern engineering techniques, skills, and tools to define, formulate, and solve engineering problem	g. function effectively on a multi-disciplinary team.	h identify professional and ethical responsibilities.	i. communicate effectively in large and small groups.	j. identify the impact of engineering solutions on the surrounding context.	k. recognize need for and engage in life-long learning	l. intelligently discuss contemporary issues.
ABET criterion 3	*a*	*a*	*a*	*c*	*b*	*e,k*	*d*	*f*	*g*	*h*	*i*	*j*
Courses												
Basic skills and Understanding												
Written Communication							I		D		D	
World Civilizations							I	D		D		D
Arts and Humanities												
Elective										I		I
Elective										I		I
Social Science												
Economics										I		I
Elective										I		I
Mathematics												
Calculus I	D					I						
Calculus II	D				I	I						
Calculus III	D					I						
Calculus IV	D					I						
Statistics & Probability					M							
Physical Science												
Chemistry		D		I							I	I
Chemistry Lab		D		I			I		D		I	
Organic Chem		M		I							D	D
Organic Chem Lab		M		I			I		D		D	

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ABET criterion 3	*a*	*a*	*a*	*c*	*b*	*e,k*	*d*	*f*	*g*	*h*	*i*	*j*
Courses												
Physics I	I	D	I		I	I				I	I	I
Physics Lab	I	D	I		I	I	I		D		I	
Physics II	D	M	D		D	D				I	D	D
Physics II Lab	D	M	D		D	D	I		D		D	
Biology												
Biology I		I					I		I			
Biology I Lab		I			I		D		D			
Biology II		D					I		I			
Biology II Lab		D			D		D		D			
Biology Elective		M					D		M		D	
Biology Elective Lab		D			M		D		M			
Computer Programming												
C Programming				I		D	D		I			
Engineering Topics												
Engineering Mathematics	M	M	D			D						
Circuit Analysis	M	I			D	D	D			I	I	
Statics	I	D	M			D	D			D		
Dynamics	I	D	M			D	D			D		
Thermodynamics	D	D	M			D	D			D		
Fluids/WI	D	D	M		D	D	D		D	D		
**All BE Classes have significant design and biology content :*												
BE Required												
Mass and Energy Balances (260)	D	I	M	D	I	I	D		M	D	I	D
Dynamic Systems Modeling (350)	M	D	D	D		M			D	D		

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ABET criterion 3	*a*	*a*	*a*	*c*	*b*	*e,k*	*d*	*f*	*g*	*h*	*i*	*j*
Courses												
Dynamic Syst. Modeling Lab (350L)	D	I	I	I	M	M	D		M	D	D	D
Transport Phenomena (373)	M	D	M	D	D	M			M	D	D	D
Senior Engineering Design I/WI	M	M	M	M	M	M	M	M	M	M	M	M
Senior Engineering Design II/WI	M	M	M	M	M	M	M	M	M	M	M	M
BE Electives												
Introduction to BE (150)		I	I	I	I	I	I	I	I	I	I	I
Geotech. Engineering (CEE 355)		D	M		M		D	M	D			
Engineering Economics (405)						M	D			D		
Bioconv. for Energy and Fuel (410)	I	D	M	D	M	D	D		D	M	D	D
Food Engineering (411)	I	I	D	D	M	D	M		D		D	
Sensors & Instr. for Biol. Syst. (420)	D	M	D	D	M	M	M		M	I	D	D
Environmental Biotechnology (431)		M		M	M		D		D	M		M
Biosystems Unit Operations (437)	D	D	D	M	D	I	D		D	D	I	
Bioreactor Design and Analysis (460)	M	D	M	M	M	D	D		M	D	D	D
Bioprod. & Bioproc. Design (470)	D	D	D	M	M	M	D		D	D	D	

I = Introductory; D = Developmental; M = Mastery (in at least one of the performance criteria under the given outcome). Greater detail on mastery level is provided in the rubrics in Appendix F, Section A.