	A	B	U	V	W	X	Y	Z	AA
1		**Student Learning Outcomes** **(Objective Levels: I = Introduction; E=Engagement; M=Mastery)**	**CHEM 246**	**LAND 220/LIFE 320**	**BSPM 20? Seminar**	**STAT 301 OR STAT 307**	**BSPM 308**	**BSPM 361**	**HORT 260**
2	**1. Technical Competencies**								
3	*Integrate skills and knowledge to solve problems related to plants, insects, and microbes in natural and managed ecosystems*								
4	**a.**	Identify important plants, insects, and microbes, integrating methods such as molecular approaches and ocular use of taxonomic keys	I	E			E	E	E
5	**b.**	Explain the biology and ecology of important pests and beneficial species		E			E	E	E
6	**c.**	Provide cost effective, socially acceptable, and environmentally sound pest management solutions. • *Students must be able to explain the economic, social, and environmental effects and implications of treatment of pest species (e.g. weeds, insects, diseases)*					E	E	E
7	**2. Agricultural Literacy**								
8	*Demonstrate understanding of social, economic, and biophysical aspects of the management of biological problems in natural and managed ecosystems*								
9	**a.**	Identify participants and evaluate their roles in pest management policy, including regulatory frameworks					E	E	
10	**b.**	Describe the similarities and differences among management of biological problems such as infestations of weeds, insect pests, and or disease in natural and managed ecosystems.		E			E	E	

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11	**c.**	Develop logical, objective, balanced arguments regarding contemporary issues in natural and managed ecosystems . • *Contemporary issues are those that currently affect the productivity and sustainability* of natural and managed systems. They may include, but are not limited to, issues related to (1) how different cultural practices, such as irrigation or tillage, influences pests of plants, (2) the economic, social, and biophysical effects of methods of pest management such as use of synthetic herbicides or other pesticides. The most pressing issues will change over time.*		E					
12	**d.**	Explain the benefits and risks of management practices in natural and managed ecosystems. • *Management practices include, but are not limited to those described in 2c above.*		I			E	E	
13									
14	**3. Critical Thinking**								
15		*Describe, assess, analyze and synthesize knowledge from across the curriculum to create solutions for pests and beneficial species in natural and managed ecosystems*							
16	**a.**	Describe critical problems and gaps in information for natural and managed ecosystems through assessment, analysis, and integration of facts. • *This includes the productivity and sustainability of these ecosystems and issues described in 2c.*		E		E	E		E
17	**b.**	Integrate, synthesize, and apply information from across the curriculum to create solutions to complex problems. • *Complex problems are challenges to productivity and sustainability of natural and managed ecosystems such as described in 2c.*	I	E		E	E	E	E

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18	**c.**	Analyze qualitative (facts) and quantitative (numerical) information and derive conclusions about challenges in the productivity, sustainability, and management of natural and managed ecosystems. • *Qualitative (facts) and quantitative (numerical) information gained from Technical Competencies and Agricultural Literacy objectives.*	I	E		E	E	E	
19									
20	**4. Leadership**								
21	*Promote and practice inclusion to form effective teams that solve complex problems in natural and managed ecosystems*								
22	**a.**	Function effectively within diverse* teams to solve complex problems and achieve desired outcomes in natural and managed ecosystems. • *Complex problems as defined in 3b*				E	E		
23	**b.**	Create and facilitate inclusive and diverse teams. • *Complex problems as defined in 3b*		E		E			
24									
25	**5. Communication**								
26	*Communicate effectively with diverse audiences regarding sustainable pest and pathogen management in natural and managed ecosystems*								
27	**a.**	Engage stakeholders such as researchers, farmers, and industry representatives in the identification of pest and pathogen management needs.					I	I	
28	**b.**	Excel in written and verbal communication of scientific results and analyses of information related to sustainable pest and pathogen management to diverse audiences including peers, stakeholders, public and the media	I	E		E	E	E	