Conservation Biology and Ecology Option of the BS in Biological Sciences.
Summary of undergraduate curriculum assessment
15 September 2014

For undergraduates within the Conservation Biology and Ecology Option of the BS in Biological Sciences, four broad elements of competence (Tables 1 & 2) were assessed in the first round of annual assessment. Because the option is new, data were not available for all of the specific elements listed in Table 1. With the available data, 8 of the specific elements identified in Table 1 could be assessed with data from 2 upper division classes, with at least one element assessed for each of the 4 broad elements. In all 8 cases, student scores substantially exceeded the acceptable thresholds identified in the assessment document. Thus, no changes to the curriculum are recommended on the basis of these data.

The elements assessed and mean student scores are reported immediately below **in bold**, with the required threshold shown *in italics*.

Demonstrate effective written and oral communication
BIOE 455: Grant proposal and mock review panel

Grant proposal (written): mean = **89%** > *70%*
Proposal reviews (written): mean = **93%** > *70%*
Mock review panel (oral): mean = **95%** > *70%*

BIOE 440: Scientific review paper: mean = **85%** > *70%*
Essay exams: mean = **91%** > *70%*

Demonstrate an understanding of the process by which scientific knowledge is generated and evaluated
BIOE 455: Grade on primary literature discussions
Primary literature discussions: mean = **83%** > *70%*

BIOE 440: Scientific review paper: mean = **85%** > *70%*

Demonstrate an understanding of the ways that ecological principles can be used to solve practical problems
BIOE 455: Selected assignments or exam questions
Debates (e.g., "We should perform assisted migrations", "Wildfires should be allowed to burn", etc.): mean = **94%** > *70%*

Demonstrate basic understanding of the ways that economic, legal and social issues affect conservation problems, policies and solutions

BIOE 440: Exam 1 (material on climate change, human population growth, anthropogenic extinction): mean = **90%** > *70%*

Table 1: Assessment Design for Conservation Biology and Ecology Option, BS in Biological Sciences

	Curriculum Component	**Specific Element Assessed**	**Threshold**
Demonstrate effective written and oral communication.	WRIT 201 COM 110 or CLS 101US BIOE 440 BIOE 455	Completion of course entirely devoted to writing Completion of course with heavy emphasis on speaking Scientific review paper Grant proposal and mock review panel	≥C- ≥C- ≥70% ≥70%
Demonstrate an understanding of physical and chemical factors that influence organisms, their physiology, and ecosystem function.	CHMY 141, 143, 211 BCHM 380 or ENSC 245 PHYX 205 BIOO 412 or BIOO 433 BIOE 428	Completion of general and organic chemistry Completion of biochemistry or soil science Completion of general physics Selected questions on physiological ecology Selected questions on biogeochemistry, ecosystem ecology	≥ C- ≥ C- ≥ C- ≥70% ≥70%
Demonstrate the ability to apply quantitative reasoning and appropriate mathematical and statistical methods to describe or explain phenomena in the natural world.	STAT 216, 217, 410 BIOE 370 BIOE 440	Completion of 3 semesters of statistics Selected questions on population models Selected questions on population models	≥ C- ≥70% ≥70%
Demonstrate basic understanding of the major disciplines in biology including physiology, genetics, evolution, ecology and systematics.	BIOO 412 or BIOO 433 BIOB 375 BIOB 420 BIOE 370 BIOO 415,475, 470 or BIOE 428 BIOB 480	Completion of course entirely devoted to physiology Completion of course entirely devoted to genetics Completion of course entirely devoted to evolution Completion of course entirely devoted to ecology Selected questions on ecology, physiology, genetics and evolution Selected questions on genetics and evolution	≥ C- ≥ C- ≥ C- ≥ C- ≥70% ≥70%
Demonstrate an understanding of the process by which scientific knowledge is generated and evaluated.	BIOB 103CS BIOE 440 BIOE 4## Cons Biol Res BIOE 455 BIO 428	Selected questions on scientific method Scientific review paper Selected assignments emphasizing analysis & hypothesis testing Grade on primary literature discussions Literature discussions and written interpretations	≥70% ≥70% ≥70% ≥70% ≥70%
Demonstrate the ability to use logic and reasoning to evaluate one's own work and the work of others.	PHL 236 BIOE 4## Cons Biol Res	Completion of course entirely devoted to formal logic Selected assignments emphasizing interpretation of data and inferences	≥ C- ≥70%
Demonstrate understanding of the major areas of population ecology, interspecific interactions and interactions with the physical environment.	BIOE 370 BIOE 428 or 455	Selected questions on population ecology, interspecific interactions and interactions with the abiotic environment Selected questions on population ecology, interspecific interactions and interactions with the abiotic environment	≥70% ≥70%
Demonstrate understanding of ecological patterns and processes at levels of organization above the population, including community ecology and ecosystem ecology	BIOE 370, 455, 428	Selected exam questions	≥70%

Demonstrate an understanding of the ways that ecological principles can be used to solve practical problems	BIOE 455 BIOE 428	Selected assignments or exam questions Selected exam questions	≥70% ≥70%
Demonstrate an understanding of current patterns of biodiversity and extinction, and why these patterns are of concern	BIOE 440	Selected essay questions	≥70%
Demonstrate an understanding of the ways that natural and human related factors alter population dynamics and extinction risk, community dynamics ecosystem function and evolutionary processes.	BIOE 440 BIOB 480 BIOE 428	Selected essay questions Selected exam questions Selected exam questions	≥70% ≥70% ≥70%
Demonstrate an understanding of the methods by which conservation problems are identified and addressed	BIOE 440 BIOE 440 BIOE 428	Review paper Selected essay questions Selected essay questions	≥70% ≥70% ≥70%
Demonstrate basic understanding of the ways that economic, legal and social issues affect conservation problems, policies and solutions	Social sciences block	Completion of 3 or more courses focusing entirely on environmental issues in economics, law or sociology	≥C-

Table 2. Timeline for assessment of each element: Conservation Biology and Ecology Option, BS in Biological Sciences

	Assessment Year			
Learning Outcome	2011-2012	2012-2013	2013-2014	2014-2015
Demonstrate effective written and oral communication.	X			
Demonstrate an understanding of physical and chemical factors that influence organisms, their physiology, and ecosystem function.		X		
Demonstrate the ability to apply quantitative reasoning and appropriate mathematical and statistical methods to describe or explain phenomena in the natural world.			X	
Demonstrate basic understanding of the major disciplines in biology including physiology, genetics, evolution, ecology and systematics.				X
Demonstrate an understanding of the process by which scientific knowledge is generated and evaluated.	X			
Demonstrate the ability to use logic and reasoning to evaluate one's own work and the work of others.		X		
Demonstrate understanding of the major areas of population ecology, interspecific interactions and interactions with the physical environment.			X	
Demonstrate understanding of ecological patterns and processes at levels of organization above the population, including community ecology and ecosystem ecology				X
Demonstrate an understanding of the ways that ecological principles can be used to solve practical problems	X			
Demonstrate an understanding of current patterns of biodiversity and extinction, and why these patterns are of concern		X		
Demonstrate an understanding of the ways that natural and human related factors alter population dynamics and extinction risk, community dynamics ecosystem function and evolutionary processes.			X	
Demonstrate an understanding of the methods by which conservation problems are identified and addressed				X
Demonstrate basic understanding of the ways that economic, legal and social issues affect conservation problems, policies and solutions	X			