

LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:	Senate Action Date:
		09-40 e	App-12/8/09	App 1/24/10

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person(s) David Pistole & B. Gail Wilson	Email Address dpistole@iup.edu bgwilson@iup.edu
Proposing Department/Unit Liberal Studies	Phone 357-5715, 357-2612, 357-3210

Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

- 1. Course Proposals (check all that apply)**
- | | | |
|--|--|---|
| ☐ New Course | ☐ Course Prefix Change | ☐ Course Deletion |
| ☐ Course Revision | ☐ Course Number and/or Title Change | ☐ Catalog Description Change |

<u>Current Course prefix, number and full title</u>	<u>Proposed course prefix, number and full title, if changing</u>
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- 2. Additional Course Designations: check if appropriate**
- | | |
|--|--|
| ☐ This course is also proposed as a Liberal Studies Course. | ☐ Other: (e.g., Women's Studies, Pan-African) |
| ☐ This course is also proposed as an Honors College Course. | |

- 3. Program Proposals**
- | | | |
|---|---|--|
| ☐ New Degree Program | ☐ Program Title Change | ☒ Other |
| ☐ New Minor Program | ☐ New Track | Liberal Studies Criteria for
Mathematics/Fine Arts/
Philosophy & Religious Studies/
Natural Science |

Liberal Studies Criteria for
Natural Science

<u>Current program name</u>	<u>Proposed program name, if changing</u>
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4. Approvals		Date
Department Curriculum Committee	N/A	
Chair(s)		
Liberal Studies Department Chair(s)	David H. Pistole	11/11/09
College Curriculum Committee Chair	N/A	
College Dean	David H. Pistole	
Director of Liberal Studies *	David H. Pistole	11/11/09
Director of Honors College *		
Provost *	David H. Pistole	11/20/09
Additional signatures as appropriate:		
(include title)		
UWUCC Co-Chairs	Gail S. Schust	12/8/09

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Liberal Studies

Natural Science

Students are required to complete two (2) courses in Natural Science. Unless specified by their major department or college, students may choose Natural Science Option 1 of eight credits (two lab science courses) or Option 2 of seven credits (one lab science course and one non-lab science course). With either option, students are not required to take the same science prefix for both courses unless that requirement is specified by their major department or college. Lab science courses cover a core set of laboratory practices and scientific methodology concepts and include a laboratory component for at least one credit.

1. Natural Science Lab-Science Courses

Lab-Science Courses Expected Undergraduate Student Learning Outcomes

Syllabi for courses designed to fulfill the Liberal Studies Natural Science lab-science requirement must provide course content that enables students to achieve the Expected Undergraduate Student Learning Outcomes identified below. Course proposals may identify additional objectives from the list of Expected Undergraduate Student Learning Outcomes as appropriate to the course content.

As Informed Learners students will demonstrate knowledge and understanding of:

- the natural world or the ways of modeling the natural, social and technical worlds

Empowered Learners students will demonstrate:

- problem solving skills using a variety of methods and tools
- critical thinking skills including analysis, application and evaluation

Responsible Learners students will demonstrate:

- intellectual honesty

Lab Science Required Course Content

Courses designed to meet the Liberal Studies Natural Science lab-science requirement must include content and instruction that provides opportunities for students to:

- examine a body of knowledge of natural science that will contribute to an understanding of the natural world and an appreciation of the impacts that natural sciences have on the lives of individuals and the world in which they live
- understand the difference between science as a knowledge base and science as a process that generates knowledge
- develop an inquiring attitude consistent with the tenets of natural science
- understand the empirical nature of science
- understand the concept of bias and the efforts to which scientists go to avoid it
- to learn the proper application of scientific methodology in an appropriate context

Individuals proposing courses to fulfill the Natural Science non-lab science requirement are encouraged to include course material and instruction in which students:

- develop skills in effective use of oral and written communication as appropriate
- apply problem solving and critical thinking skills to reach conclusions

Lab Science Common Learning Objectives

All courses designed to fulfill the Liberal Studies Natural Science lab-science requirement will establish the following common course learning objectives.

At the conclusion of the course the student should be able to:

- understand a body of knowledge in a science domain
- understand that science knowledge is generated by an empirical approach to nature and analyze problems from the perspective of a natural scientist
- demonstrate an understanding of intellectual honesty in the context of scientific methodology, and contrast science with pseudoscience
- understand how science knowledge is relevant to non-scientists
- use critical thinking skills and scientific methodology.

2. Natural Science Non-lab Science Courses

Non-lab Science Expected Undergraduate Student Learning Outcomes

Syllabi for courses designed to fulfill the Liberal Studies Natural Science non-lab science requirement must provide course content that enables students to achieve the Expected Undergraduate Student Learning Outcomes identified below. Course proposals may identify additional objectives from the list of Expected Undergraduate Student Learning Outcomes as appropriate to the course content.

As Informed Learners students will demonstrate knowledge and understanding of:

- the natural world or the ways of modeling the natural, social and technical worlds

Empowered Learners students will demonstrate:

- problem solving skills using a variety of methods and tools
- critical thinking skills including analysis, application and evaluation

Responsible Learners students will demonstrate:

- intellectual honesty

Non-Lab Science Required Course Content

Courses designed to meet the Liberal Studies Natural Science lab-science requirement must include content and instruction that provides opportunities for students to:

- examine a body of knowledge of natural science that will contribute to an understanding of the natural world and an appreciation of the impacts that natural sciences have on the lives of individuals and the world in which they live
- understand the difference between science as a knowledge base and science as a process that generates knowledge
- develop an inquiring attitude consistent with the tenets of natural science
- understand the empirical nature of science

- understand the concept of bias and the efforts to which scientists go to avoid it

Non-lab Science Common Learning Objectives

All courses designed to fulfill the Liberal Studies Natural Science non-lab science requirement will establish the following common course learning objectives.

At the conclusion of the course the student should be able to:

- understand a body of knowledge in a science domain
- understand that science knowledge is generated by an empirical approach
- demonstrate an understanding of intellectual honesty in the context of scientific methodology, and contrast science with pseudoscience
- understand how science knowledge is relevant to non-scientists
- use critical thinking skills and scientific methodology

Additionally, individuals proposing courses to fulfill the Natural Science lab-science requirement are encouraged to include course material and instruction in which students:

- develop skills in effective use of oral and written communication as appropriate
- apply problem solving and critical thinking skills to reach conclusions.

From: Sandra Newell
To: David H Pistole
Cc: Carl S. Luciano
Sent: Friday, October 30, 2009 12:52 PM
Subject: LS Natural Science

David,

With regard to the revised LS Natural Science criteria (both lab and non-lab), the Biology Department suggests further condensation of the point "Apply problem solving and critical thinking skills to reach conclusions." deleting the phrase "including understanding ethical and behavioral consequences..." With this deletion, the Biology Department voted unanimously to support the revised Natural Science criteria proposed by the LS Committee. Do you need anything further from us on the Natural Science criteria?

Sandy

Sandra J. Newell, Ph.D.
Department of Biology

From: Mary Lou Zanich
To: dpistole@iup.edu
Cc: sjnewell@iup.edu ; Sanwar.Ali@iup.edu ; Raymond Pavloski ; Michael Poage ; John Woolcock ; Daniel A Burkett ; Stanley Sobolewski
Sent: Tuesday, November 03, 2009 12:42 PM
Subject: Natural Science Criteria

Dr. Pistole,

As you know the College of Natural Sciences and Mathematics formed an Ad Hoc Committee to review and develop recommendations, if necessary, regarding the Liberal Studies criteria for the Natural Science and Mathematics areas. There were very few concerns with the criteria for the Mathematics area. We made numerous suggestions regarding the content (and number) of the criteria for the Natural Science requirement. We were pleased with the Committee's initial responsiveness to our suggestions and to the suggestions of the Biology Department. We believe that the criteria, as we saw them, represent an improvement; we would support the criteria as revised. As you know, we still have some questions about the process which will be followed in implementing the criteria.

Thanks you for your openness .

Mary Lou Zanich, Ph.D.
Interim Dean, College of Natural Sciences and Mathematics
Professor of Psychology