Development of a new course. 

*My objectives in developing this course were:*

1. To complement the humanities courses in our Latin American Studies Concentration with a course that explores the biological diversity and current environmental issues of Latin America from a scientific point of view.

2. To increase students’ understanding of the geographic and biological diversity in Mexico, Central America, South America, and the Caribbean.

3. To familiarize students with the current status of representative sites of particular natural value in Latin America.

4. To integrate the theme of sustainability into the course as a framework for exploring specific “challenges” of how current public policies and technological developments are impacting various environments in Latin America.

5. To provide students with the opportunity to critically evaluate cases where the goal of sustainability has been applied to an environmental system.

*The goal of the course* is to help students understand how the natural processes in this region made possible the tremendous diversity of habitats and organisms, in what ways these habitats and organisms are threatened today, and how individuals and organizations are trying to plan a sustainable future for Latin American environments.

**Course overview:**

After exploring the geologic, geographic, and evolutionary history of the terrestrial, freshwater, and marine environments of Latin America, students will apply this basic scientific knowledge to examine the current status of representative sites in Latin America. They will critically examine scientific data from the literature on the environmental status of a particular site in Latin America and apply them to understand the potential for sustainability at that site. Finally, students will investigate a specific environmental issue through an independent project, collect and interpret their data, and present their findings in writing and in an oral presentation to the class. They will research the pertinent geologic, geographic, natural, and land-use history of the area, explain all sides of the current issue, and propose a reasonable, sustainable solution.
Biol. 204: Environmental Issues in Latin America
Proposal for a new course
Janice Voltzow
Department of Biology

The geologic, geographic, and evolutionary history of Latin America have produced a region that has an enormous range of habitats, houses some of the most diverse ecosystems on earth, and presents some of the greatest challenges for conservation biology and habitat preservation. The goal of the course is to help students understand how the natural processes in this region made possible this tremendous diversity of habitats and organisms, in what ways these habitats and organisms are threatened today, and how individuals and organizations are trying to plan a sustainable future for Latin American environments.

Objectives for students:
1. Students will explore the geologic, geographic, and evolutionary history of the terrestrial, freshwater, and marine environments of Mexico, Central America, South America, and the Caribbean region.
2. Students will apply this basic scientific knowledge to examine the current status of representative sites in Latin America.
3. Students will critically examine scientific data from the literature on the environmental status of a particular site in Latin America and apply them to understand the potential for sustainability at that site.
4. Students will investigate a specific environmental issue through an independent project, collect and interpret their data, and present their findings in writing and in an oral presentation to the class.

Course schedule: Three one-hour sessions per week

Course format: Lecture and discussion

Grading will be based on:
Class participation and homework exercises 50 points
Quizzes (3 x 50 points each) 150 points
Projects 200 points
Total 400 points

Course assessment and mechanisms for improvement:
Student responses to homework assignments will be used to gauge their comprehension of specific topics and progress in achieving the objectives of the course and of general education courses in natural science. Topics that seem more difficult will be reviewed in class. Mid-way through the course and at the end of the course students will be asked to complete questionnaires regarding which aspects of the course they feel are the most and least valuable and why. Their responses will be used to alter the topics and exercises integrated into the course.
Environmental Issues in Latin America

Voltzow

Course materials:
As with many interdisciplinary topics, there is no single text or resource that matches the objectives of this course. The text has been chosen to provide students with background regarding the geologic and geographic history of Latin America, as well as patterns of human settlement, agriculture, and urbanization. This material will be supplemented with specific articles from the primary and secondary literature related to the biological diversity and structure of the major marine, freshwater, and terrestrial biomes of Mexico, Central America, South America, and the Caribbean.

Text:

Supplemental materials (representative list):


**Outline of topics:**

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<tr>
<th>Week</th>
<th>Topic</th>
<th>Resources</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction; Physical environments of Latin America</td>
<td>Blouet and Blouet (2006) chaps. 1 and 2</td>
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<tr>
<td>2</td>
<td>Physical environments continued</td>
<td>Portions of chaps. 8-14</td>
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<td>3</td>
<td>Tropical and subtropical terrestrial biomes</td>
<td>Supplemental sources</td>
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<td>4</td>
<td>Higher latitude and montane biomes</td>
<td>Supplemental sources</td>
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<tr>
<td>5</td>
<td>Freshwater and marine biomes</td>
<td>Supplemental sources</td>
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<tr>
<td>6</td>
<td>Biomes concluded; Presentations of project 1</td>
<td>Supplemental sources</td>
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<tr>
<td>7</td>
<td>Historical geography</td>
<td>Blouet and Blouet (2006) chaps. 3 and portions of 8-14</td>
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<tr>
<td>8</td>
<td>Human demographics</td>
<td>Blouet and Blouet (2006) chaps. 5,6</td>
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<td>9</td>
<td>Challenges: Deforestation and urbanization</td>
<td>Blouet and Blouet (2006) chaps. 6, 13, and supplemental sources</td>
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<td>10</td>
<td>Over fishing, destructive agricultural practices, pollution</td>
<td>Supplemental sources</td>
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<tr>
<td>11</td>
<td>Invasive species and global climate change</td>
<td>Supplemental sources</td>
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<tr>
<td>12</td>
<td>Conservation of indigenous cultures and languages</td>
<td>Supplemental sources</td>
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<tr>
<td>13</td>
<td>Ecotourism</td>
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<td>14</td>
<td>Potential for sustainability in Latin America: Case studies</td>
<td>Supplemental sources</td>
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<tr>
<td>15</td>
<td>Presentations of project 3</td>
<td>Supplemental sources</td>
</tr>
</tbody>
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**Project 1: Ecotourism travelogue**

Each student will compose a short (5 min.) PowerPoint slide show on the natural history of a specific site in Latin America as if they had visited that area and are sharing their photos with their friends. Students will describe the biology of the habitats and organisms they illustrate. Images may come from the web; all sources need to be identified and credited.

**Project 2: World Heritage Sites as examples of conservation efforts**

Each student or pair of students will select one UNESCO World Heritage Sites in Latin America that has been designated because of its biological resources (based either on the natural criteria of the 2002 *Operational Guidelines* or on criteria vii, viii, ix, or x of the 2005 *Operational Guidelines* (http://whc.unesco.org/en/guidelines). Students will
describe the natural resources at the site, the basis for its inclusion as a site, and its current status, including any current threats or dangers. The World Heritage web site (http://whc.unesco.org/) has links to site descriptions and all UNESCO documents. Students will also search for additional documentation outside the UNESCO links to investigate any current controversies or pending issues.

**Project 3: Independent project on an environmental issue in Latin America**  
With the aid of the instructor, each student will select an environmental issue or case study to investigate. Topics may include, but are not limited to, cooperative projects between the private and public sector, debt-for-land swaps, agricultural or fishery projects, scientific studies of biodiversity, or local attempts at sustainability. Students will research the pertinent geologic, geographic, natural, and land-use history of the area, explain all sides of the current issue, and propose a reasonable, sustainable solution. Students will prepare a written report and present their project to the class orally.
Environmental Issues in Latin America

Proposal for Designation as a General Education Natural Science (E) Course

Janice Voltzow

The following addresses how the course fulfills the six major objectives identified for General Education courses in the Natural Sciences.

1. In this course students will consider the evidence generated by scientific inquiry (experiments and systematic observations) of the geologic, geographic, and evolutionary history of the land and organisms occurring in Mexico, Central America, South America, and the Caribbean and uncover how that evidence has been used to develop current models of biological diversity and distribution. Their understanding of the evidence will be assessed through three quizzes during the semester and well as through their incorporation of evidence-based arguments in the course projects.

2. Students will explore the empirical nature of science, as well as the interplay between theory and experiment, through comparisons of methods for determining biological diversity and the results gained from the applications of those methods.

3. Data from studies of global climate change will be compared to test the validity of the various models and predictions for change in Latin America. The abilities of students to apply these techniques for data analysis will be assessed through quizzes.

4 and 5. Many of the observations Charles Darwin made onshore and during his voyage around South America on the *Beagle* led him to develop his theory of evolution by natural selection. Passages from the *Beagle* will be incorporated into the course readings on geology, geography, and biomes and will be linked to corresponding passages from Darwin’s notebooks and from *On the Origin of Species*. This foundation will be expanded to incorporate modern theories to explain current patterns of diversity and biogeography observed in this region.

6. Many of the topics addressed in the “challenges” section of the course will consider how current public policies and technological developments are impacting various environments in Latin America. Students will be addressing specific examples of these policies and challenges in their second and third projects, as well as their potential to achieve sustainability.