
TOPICS IN SCIENCE: INTRODUCTION TO BIODIVERSITY in Fall 2019 (SC1091B)

Course Code	SC1091B	Professor(s)	Manuel Caballer Gutierrez
Prerequisites	None	Office Number	C202
Class Schedule	TF: 10:35-11:55 in C-102	Office Hours	By appointment
Credits	4	Email	mcaballergutierrez@au p.edu
Semester	Fall 2019	Office Tel. Ext.	614

Course Description

The Earth is changing. It has been constantly changing since before the origin of Life, but at the present it seems to be changing much faster than ever before. So fast that hundreds, probably thousands, of species become extinct every year because their habitats are being dramatically altered. So fast that teenagers all over the planet are organizing "strikes 4 Climate". So fast, that even politicians are starting to think about doing something about it.

Exponential technological development during the last century, together with the concentration of the world's human population in these artificial environments that we call cities, have led us to believe that we are independent from the environment. However, in the context of global change, the general public is "re-discovering" that the human species actually depends on the proper functioning of ecosystems and on the services they provide. Our survival depends on biodiversity and its conservation.

The term biodiversity (or biological diversity) is commonly used in newspapers, in political debates, and even in social media. But, what is it? The extent and complexity of the study of biodiversity makes necessary an interdisciplinary approach that mixes biological, political, social and economic sciences. Nevertheless, at the present there seems to be a general consensus about the great value of biodiversity, and its conservation has become a global priority. Those with a solid background in this field and the skills to identify strategies to preserve diversity from new perspectives are professionals in demand.

This broad course will provide an overview of biological diversity and will place it in an evolutionary and ecological context. The course will also focus on the conservation and management of biodiversity, from social, economic, and political perspectives. During the semester, we will answer questions such as: Why is biodiversity important? How do species evolve or become extinct? Is the human being responsible for the loss of biodiversity? Can we assign an economic value to the services provided by biodiversity?

This course emphasizes science literacy and critical thinking through the study of biological diversity. Students will be guided by a text book for some lectures, but not for all, given that to date, any published book covers all the topics.

Course Learning Outcomes

General Education

This course fulfills the AUP Science General Education requirement GE130.

Course Outline

Classes	Date	Subject	Unit
September 2nd, All courses begin			
1	Tue 3 Sept	<i>Syllabus presentation</i>	Intro to the course
2	Fri 6 Sept	Biodiversity: what is it? General concepts	Unit 1: Biological diversity
September 8th, Last day to DROP/ADD course online			
3	Tue 10 Sept	History of evolutionary thinking	Unit 1: Biological diversity
Lab 1	Tue 10 Sept	Scientific method – hypothesis	
4	Fri 13 Sept	Theory of evolution	
Lab 1	Fri 13 Sept	Scientific method – hypothesis	
5	Tue 17 Sept	Genetic diversity versus inbreeding. Speciation	
6	Fri 20 Sept	Diversity of species versus dominance. The magnitude of biodiversity	
Labs 2-3	Sat 21 Sept	Visit to MNHN: evolution	
7	Tue 24	The tree of Life 1	

	Sept		
Lab 4	Tue 24 Sept	Microscopy: different kinds of cells and tissues	
8	Fri 27 Sept	The tree of Life 2	
Lab 4	Fri 27 Sept	Microscopy: different kinds of cells and tissues	
9	Tue 1 Oct	Ecosystems diversity	
10	Fri 4 Oct	How biodiversity is measured: surveys, collections, taxonomists and new technologies to accelerate the catalogue of Life (from digitization to artificial intelligence)	
Labs 5-6	Sat 5 Oct	Visit to the Aquarium: species diversity	
11	Tue 8 Oct	How biodiversity is measured: biodiversity indexes to metagenomics	
Lab 7	Tue 8 Oct	Biodiversity sampling	
12	Fri 11 Oct	Ecology	Unit 2: Biodiversity processes
Lab 7	Fri 11 Oct	Biodiversity sampling	
13	Tue 15 Oct	Midterm	
Lab 8	Tue 15 Oct	Biodiversity indexes calculation	
October 16th, Mid-semester			
14	Fri 18 Oct	Ecology	Unit 2: Biodiversity processes
Lab 8	Fri 18 Oct	Biodiversity indexes calculation	
October 18th, Mid-semester grades due			
15	Tue 22 Oct	Biodiversity distribution	Unit 2: Biodiversity processes
16	Fri 25 Oct	Biodiversity gradients	
Labs 9-10	Sat 26 Oct	Visit to the zoo: species ID using AI (app)- ecosystems recognition- phylogenetic relationships among species from different ecosystems	
17	Tue 29 Oct	Great extinctions and climate change	
October 30th to November 3rd, Fall break (no classes)			
November 4th, Last day to withdraw from a course/Last day to choose CR/NC grading option			
18	Tue 5 Nov	Biodiversity Services	Unit 2: Biodiversity processes
Lab 11	Tue 5 Nov	Extinction caused by invasive species	
19	Fri 8 Nov	Conservation (IUCN) and	

		sustainability	
Lab 11	Fri 8 Nov	Extinction caused by invasive species	
November 11-12, Armistice break (no classes)			
20	Fri 15 Nov	The economic value of biological diversity	Unit 3: Biodiversity and Economy
Lab 12	Fri 15 Nov	Calculate the economic value of biodiversity's services	
21	Tue 19 Nov	Global economy and biodiversity	
Lab 12	Tue 19 Nov	Calculate the economic value of biodiversity's services	
22	Fri 22 Nov	Rachel Carson (Silent spring). Greenpeace and other NGOs	Unit 4: Biodiversity and Social movements
23	Tue 26 Nov	Modern social symbols of biodiversity: Greta Thunberg against the panda	
24	Fri 29 Nov	Legislation as a tool for conservation	Unit 5: Biodiversity and Politics
Lab 13	Fri 29 Nov	Study case: decision-making on an environmental study case (biodiversity+economy+society+politics)	
25	Tue 3 Dec	Decision-making	
Lab 13	Tue 3 Dec	Study case: decision-making on an environmental study case (biodiversity+economy+society+politics)	
26	Fri 6 Dec	Questions before final exam	
December 6th, last day of classes			
May 7th - 11th, reading days			
27	Fri 13 Dec	Final exam (08:30)	
Thu Jan 2nd, All grades due			

The schedule is subject to change and will be revisited as the course progresses.

Saturday visits to: the National Natural History Museum in Paris, the Zoo of Paris, and the Aquarium will be scheduled early in the semester. These visits will count as double labs (assistance/evaluation).

During the course, in class time, every student must make a Power Point presentation (10 minutes), about any theme related to biodiversity of his/her interest or related to his/her background. Any theme is acceptable if the student is able to find a link to biodiversity.

There might be other members of the Department of Computer Science Math and Environmental Science invited as guests' professors.

Textbooks

This course doesn't have any textbook.

Attendance Policy

Specific attendance policy:

Students arriving more than 10 minutes after the regular start time, for whatever reason, will not be allowed in class.

Any student that fails 5 labs or more fails the course (for whatever reason).

Quizzes cannot be retaken for any reason. If you don't do the quiz you have a 0 (1 quiz every week). But the 2 lowest grades don't count.

Attendance policy:

Students studying at The American University of Paris are expected to attend ALL scheduled classes, and in case of absence, should contact their professors to explain the situation. It is the student's responsibility to be aware of any specific attendance policy that a faculty member might have set in the course syllabus. The French Department, for example, has its own attendance policy, and students are responsible for compliance. Academic Affairs will excuse an absence for students' participation in study trips related to their courses.

Attendance at all exams is mandatory.

IN ALL CASES OF MISSED COURSE MEETINGS, THE RESPONSIBILITY FOR COMMUNICATION WITH THE PROFESSOR, AND FOR ARRANGING TO MAKE UP MISSED WORK, RESTS SOLELY WITH THE STUDENT.

Whether an absence is excused or not is ALWAYS up to the discretion of the professor or the department. Unexcused absences can result in a low or failing participation grade. In the case of excessive absences, it is up to the professor or the department to decide if the student will receive an "F" for the course. An instructor may recommend that a student withdraw, if absences have made it impossible to continue in the course at a satisfactory level.

Students must be mindful of this policy when making their travel arrangements, and especially during the Drop/Add and Exam Periods.

ENGLISH LANGUAGE PROFICIENCY STATEMENT: As an Anglophone university, AUP is strongly committed to effective English language mastery at the undergraduate level. Most courses require scholarly research and formal written and oral presentations in English, and AUP students are expected to strive to achieve excellence in these domains as part of their course work. To that end, professors include English proficiency among the criteria in student

evaluation, often referring students to the university Writing Lab where they may obtain help on academic assignments. Proficiency in English is monitored at various points throughout the student's academic career, most notably during the admissions and advising processes, while the student is completing general education requirements, and during the accomplishment of degree program courses and senior theses.

Grading Policy

Item	Num.	Duration	Evaluation	Perce
Class quizzes	10	20 minutes	Percentage of right answers	20 %
Midterm	1	2 hours	Percentage of right answers	25 %
Final written	1	3 hours	Percentage of right answers	30 %
Presentation	1	10 minutes	Theme chosen and performance	5 %
Lab reports	13	N/A	Average of top 11 scores	20 %

Other
