Drexel Summer Break in Cameroon:
Biodiversity and Conservation
July 5 –27, 2017

This course is funded by a National Science Foundation – Partners in International Research and Education (NSF-PIRE) grant. Participating students will have their travel and in-country costs funded by the grant. Students will be required to pay a commitment fee, which will be refunded to them upon completion of the course. Because of the nature of this course, students will not only be given tropical field research training, but also be given the opportunity to participate in in a fully funded research project in Cameroon.

Instructors and Teaching Assistants:

Drexel University, USA Dr. Mary Katherine (Katy) Gonder, Associate Professor, Department of Biology Dr. Matthew Mitchell, Postdoctoral Research Fellow, Department of Biology	***University of California Los Angeles, USA*** Dr. Tom Smith, Professor and Director of the Center for Tropical Research Dr. Kevin Njabo, Africa Director of the Center for Tropical Research
Garoua Wildlife College Serge Kamgang, Lecturer and PhD Candidate, Dept. of Mammalogy & Wildlife Management	***University Halle-Wittenberg, Germany*** Dr. Alexandra Ley, Scientific Assistant, Institute of Geobotany
Higher Institute of Environmental Sciences (IBAY-SUP), Cameroon Dr. Zac Tchoundjeu, Dean	***University of Hong Kong*** Dr. Tim Bonebrake, Assistant Professor, School of Biological Sciences
National University of Equatorial Guinea (UNGE) Dr. Maximilliano Fero Meñé, Vice-Dean of Environmental Sciences Dr. Demetrio Bocouma Meñe, BBPP Postdoctoral Associate, UNGE Professor	***Wildlife Conservation Society - Cameroon*** Roger Fotso, WCS Country Director Bernard, Fosso, WCS Project Director Mbam Djerem National Park
University of Buea, Cameroon Dr. Eric Fokam, Chairman Department of Zoology	***Teaching Assistants*** *Fabrice Kentachime, MSc; Flaubert Djondzo, DVM; Alvine Dadjo, MSc, Ian Nichols, BA*

Course participants: U.S., Cameroon and Equatorial Guinea students studying towards a Bachelor's degree or Master's 1 in Biology.

Location: This course includes activities at the Congo Basin Institute (CBI) and the International Bilingual Academy of Yaoundé (IBAY-SUP) in Yaoundé, Cameroon, and the training center of the Wildlife Conservation Society (WCS) at Mbam Djerem National Park.

Course Overview: This is an intensive three week field course with a strong focus on hands-on experiential learning and training in biodiversity research. For US students

registered through Drexel, this course will be taught as a Special Topics course with an option for two credits. All US students are also suggested to have taken at least one course in the French language at the college level, but preferably more. US students are also expected to be in possession of a valid passport, Cameroon visa and take all required vaccinations prior to travel. All other expenses (travel, board and lodging) will be covered by the program.

Specific Aims: The overall aim of this course is to provide training in the fundamentals of tropical field research. US and Cameroon students will work collaboratively in teams to: 1) design an independent research project in tropical ecology; 2) collect data and analyze results; 3) write a report in the format of a scientific publication summarizing the aims, methods, results and conclusions of the research project; 4) present project findings to participants and instructors at the end of the course.

Learning goals:

- Understand the basic principles of conservation biology and evaluate how these principles are applied to problems in conservation
- Read the assigned literature and be able to critically assess the key concepts in a discussion and written format
- Demonstrate how to gather primary research data, work through spread-sheet exercises and manipulate software applicable to solving conservation problems
- Co-design an original research project and work effectively as a team member in a group environment
- Demonstrate an ability to effectively communicate research findings and key concepts through both oral and written presentation

Preparatory seminar: All U.S., Cameroon and Equatorial Guinea undergraduate participants will be required to attend a *mandatory* 1-3 week on-line seminar in the Spring semester prior to their departure to Africa. Topics covered include tropical field ecology and conservation research, health and safety guidelines, French language training, vaccinations and visa/passport issues. U.S., Cameroon and Equatorial Guinea students will also be placed into research teams and encouraged to get to know one another via Skype.

Travel and logistics: This course will run from July 5th –27th, 2017 and be based entirely in Cameroon. A total of 20 undergraduate students will participate in this course, half of which will be from U.S. institutions and the other half from Cameroon and Equatorial Guinea universities. U.S. students will travel to Cameroon and meet US course instructors upon their arrival in Yaoundé. All students will spend the first three days of the program attending classroom-based lectures, literature discussions and guided seminars focused around the development of their team research project in Yaoundé. The entire class and instructors will then travel to the WCS training center at Mbam

Djerem National Park for ten days. During this time, students will be expected to collect field data in teams and organize their data for analysis. All students will be expected to keep a field log while they are at Mbam et Djerem. Students will then return to Yaoundé to analyze their data, present their research findings and write up their project report.

Travel: Students arriving from the U.S. will arrive at Yaoundé Nsimalen International Airport. US students should plan on arriving in Yaoundé no later than the evening of July 6th and plan on leaving Yaoundé no earlier than the evening of July 27th. All Cameroon and US course participants will travel to Mbam Djerem National Park from Yaoundé by train and private vehicle for the field component of the course.

Accommodation: While in Yaoundé, students will be housed within easy reach of the CBI & IBAY-SUP campuses. Students will stay at the WCS Training Center at Mbam Djerem National Park (MDNP).

Classroom activities: Lecture materials and literature discussions will be focused around topics relevant to tropical ecology and conservation. In addition to these core readings, students will be expected to select a number of technical articles relevant to the 'hands-on' research projects they plan to carry out. An electronic library of scientific articles will be made available to students in order to support their independent research reports. Additionally, laboratory-based activities may be included and students will have access to these facilities for their group projects at CBI.

Research projects: Research projects can be focused around a choice of taxonomic groups that will include but are not necessarily limited to large mammals (great apes, forest antelope), plants, amphibians, birds and butterflies. Students will also have the opportunity to conduct socio-economic surveys of communities surrounding the field sites. Students will receive hands-on training in the research methods required to undertake these studies. Under instructor supervision, students will formulate hypotheses, collect and analyze field data, and write up short scientific reports on their findings. Each team will be expected to jointly produce one 10-15 page paper and give a presentation of their findings at the end of the course. Students will also be expected to communicate with team members in both English and French although presentations can be given in the speaker's first language.

Reading: Reading materials will be made available online at the course website and through the distributed on-line seminar that will be taught in Spring 2017. In addition, a library of papers relevant to the course will be made available to all students during the course in Cameroon.

Assignments:

Field notes and journal: Students will maintain a daily journal and make records of their field observations throughout the course. This document will be graded as part of their overall research assignment.

Research Project: Students will work collaboratively in teams to design and implement their own research projects at Mbam et Djerem National Park. Students will be expected to formulate coherent hypotheses, document their methods and major findings and discuss these results within the context of their original research question(s). A 10-15 page research paper and group presentation of their project will be due at the end of the course. Specific guidelines for the written and oral presentations will be provided along with guidance in selecting suitable research project. A reference library will be made available to all students during the course.

Grading:

Class participation	**15%**
Field notes and journal	**15%**
Research project report	**40%**
Research presentation	**30%**

Your grade will be based on the five items listed above. The following is an indication of how grades will be assigned:

90% and above	A
80-89%	B
70-79%	C
60-69%	D
Below 60%	F

Attendance: Attendance is mandatory unless a leave of absence is granted in advance.

Academic dishonesty: In group research, students are encouraged to work collaboratively with their peers on their research projects. However, plagiarism is never tolerated and all points will be deducted from any assignments if students are found to have copied their work from another source, published or otherwise.

Students with certified disabilities: Course organizers are committed to providing an environment where all students have the opportunity to equally participate in the academic experience, including students with disabilities. Persons requiring disability-related accommodations should notify the program coordinator at the earliest possible date so that their needs may be properly assessed and accommodated.

Detailed outline: Follows on next page

Drexel – UCLA Field Course Schedule, 5 – 27 July 2017

Date		Morning 0800-1200	Afternoon 1400-1800	Evening 1800 - 2100
Wednesday	5-Jul		US students depart Philadelphia/Dulles	
Thursday	6-Jul		Cameroonian and EG students arrive in Yaounde	US students arrive in Yaounde
Friday	7-Jul	General orientation & settling in (Matt)	Lecture: Introduction to Cameroon and the national parks (Serge); Lecture: Evolutionary biology and its application to conservation (Tom)	Dinner in Bastos
Saturday	8-Jul	Lecture: Data management and statistical analysis (Matt); Discussion of assigned readings in central African tropical ecology and conservation design (Kevin)	Workshop: An introduction to the statistical package R with exercises (Matt)	Dinner in Bastos
Sunday	9-Jul	Lecture: Introduction to GIS (Matt); Lecture: Field methods (Serge/Matt/Alexandra)	Workshop: GPS and field notes (Serge); Workshop: Research teams meet with instructors to finalize project plans (All group mentors)	Evening train departs for MDNP
Monday	10-Jul	Arrive Ngoundal	Arrive MDNP	Rest and orientation at MDNP--rules and logistics at WCS field office.
Tuesday	11-Jul	Fieldwork MDNP	Fieldwork MDNP	Evening Talk, Albert Mounga Abana & Bernard Fosso - MDNP
Wednesday	12-Jul	Fieldwork MDNP	Fieldwork MDNP	Movie, evening work
Thursday	13-Jul	Fieldwork MDNP	Fieldwork MDNP	Tom Smith

Date		Morning 0800-1200	Afternoon 1400-1800	Evening 1800 - 2100
Friday	14-Jul	Fieldwork MDNP	Fieldwork MDNP	Serge Kamgang/Fabrice Kentachime
Saturday	15-Jul	Fieldwork MDNP	Fieldwork MDNP	Matt Mitchell
Sunday	16-Jul	Fieldwork MDNP	Fieldwork MDNP	Eric Fokam/Tim Bonebrake
Monday	17-Jul	Fieldwork MDNP	Fieldwork MDNP	Movie, evening work
Tuesday	18-Jul	Fieldwork MDNP	Fieldwork MDNP	Alexandra Ley/Maxi Fero
Wednesday	19-Jul	Fieldwork MDNP	Fieldwork MDNP	Katy Gonder/Demetrio Bocouma
Thursday	20-Jul	Fieldwork MDNP	Fieldwork MDNP	Party
Friday	21-Jul	Park up and prepare departure	Depart MDNP	Depart Ngaoundal
Saturday	22-Jul	Arrive Yaoundé	Rest	Dinner in Bastos
Sunday	23-Jul	Analysis of Field data	Analysis of Field data	Dinner in Bastos
Monday	24-Jul	Meet with instructors and present preliminary analysis	Begin research project write up & presentation preparation	Dinner in Bastos
Tuesday	25-Jul	Mefou/Ape Action Africa Visit	Research project write up & presentation preparation	Dinner in Bastos
Wednesday	26-Jul	Research project write up & presentation preparation	Student presentations, Evening reception, Key note talk (Zac or Rachid)	Dinner in Bastos
Thursday	27-Jul	Wrap up papers and turn in	Pack up	Evening departure