Course Approval Form

For instructions see: *http://registrar.gmu.edu/facultystaff/catalog-revisions/course/*

Action Requested:
- [x] Create new course
- [ ] Inactivate existing course
- [ ] Reinstate inactive course
- [ ] Modify existing course (check all that apply)
  - [ ] Title
  - [ ] Prereq/coreq
  - [ ] Other:
  - [ ] Credits
  - [ ] Schedule Type
  - [ ] Repeat Status
  - [ ] Restrictions
  - [ ] Grade Type

Course Level:
- [x] Undergraduate
- [ ] Graduate

College/School: College of Science
Department: Biology
Submitted by:
Ext:
Email:

Subject Code: BIOL **Number:** 443
(Do not list multiple codes or numbers. Each course proposal must have a separate form.)

Effective Term:
- [ ] Fall
- [x] Spring
- [ ] Summer

Year 2016

Title:
Current
Banner (30 characters max w/ spaces)
New: Tropical Ecology

Fulfills Mason Core Req? (undergrad only)
- [ ] Currently fulfills requirement
- [ ] Submission in progress

Credits: (check one)
- [x] Fixed — or
- [ ] Variable — to

Repeat Status: (check one)
- [ ] Not Repeatable (NR)
- [ ] Repeatable within degree (RD)
- [ ] Repeatable within term (RT)

Maximum credits allowed: 3

Grade Mode: (check one)
- [x] Regular (A, B, C, etc.)
- [ ] Satisfactory/No Credit
- [ ] Special (A, B C, etc. +IP)

Schedule Type: (check one) LEC can include LAB or RCT
- [x] Lecture (LEC)
- [ ] Lab (LAB)
- [ ] Recitation (RCT)
- [ ] Internship (INT)
- [ ] Independent Study (IND)
- [ ] Seminar (SEM)
- [ ] Studio (STU)

Prerequisite(s): BIOL 308 or POI

Corequisite(s):

Instructional Mode:
- [x] 100% face-to-face
- [ ] Hybrid: ≤ 50% electronically delivered
- [ ] 100% electronically delivered

Restrictions Enforced by System: Major, College, Degree, Program, etc. Include Code.

Are there equivalent course(s)?
- [ ] Yes
- [ ] No

If yes, please list

Catalog Copy for NEW Courses Only (Consult University Catalog for models)

Description (No more than 60 words, use verb phrases and present tense)	**Notes** (List additional information for the course)
An introduction to the abiotic and biotic factors that define tropical habitats. The course emphasizes evolution, taxonomic diversity, and plant-animal interactions in terrestrial tropic forests	

Indicate number of contact hours: Hours of Lecture or Seminar per week: 3 Hours of Lab or Studio:
When Offered: (check all that apply) [ ] Fall [ ] Summer [x] Spring

Approval Signatures

Department Approval — Date

College/School Approval — Date

If this course includes subject matter currently dealt with by any other units, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

Unit Name	Unit Approval Name	Unit Approver's Signature	Date

For Graduate Courses Only

Graduate Council Member — Provost Office — Graduate Council Approval Date

For Registrar Office's Use Only: Banner_____ Catalog_____

revised 10/16/14

Course Proposal Submitted to the Curriculum Committee of The College of Science

1. **COURSE NUMBER AND TITLE**: BIOL 443: Tropical Ecology

   Course Prerequisites: BIOL 308 or permission of instructor

   Catalog Description: BIOL 443 is an introduction to the abiotic and biotic factors that define tropical habitats. The course emphasizes evolution, taxonomic diversity, and plant-animal interactions in the tropics and focuses on a cross-continental comparison of flora, fauna, and contemporary indigenous cultures.

2. **COURSE JUSTIFICATION**: BIOL 443 is the only undergraduate level course offered that provides a detailed investigation of tropical terrestrial plant and animal biological diversity.

   Course Objectives: The purpose of this class is to introduce students to basic ecological and evolutionary concepts within the context of tropical biology. Upon completion of this course, students are expected to understand:

   - The planetary, climatological, geological and geographic conditions that dictate the locations of lowland wet forests and other tropical habitats
   - The physiognomy, diversity and continental variability of contemporary tropical habitats
   - The taxa, diversity, evolutionary origins, and ecosystem services provided by the major vertebrate and invertebrate tropical fauna
   - The taxa, diversity evolutionary origins, and ecosystem services provided by the major flora of tropical forests
   - The role of abiotic and biotic factors in maintaining tropical biological diveristy
   - The pre-historic, historic and current distribution of humans within tropical forests
   - The contemporary conservation issues concerning terrestrial, aquatic, and marine tropical habitats

   Course Necessity: This course fills a need for upper level elective courses for biology students pursuing conservation, environmental sciences, or certificates. It is critical for students interested in

   Course Relationship to Existing Programs: This will be an elective within the BA and BS in Biology.

   Course Relationship to Existing Courses: This course is similar Tropical Ecosystems, previously taught as BIOL 543, but this course will be phased out due to declining

enrollment interest at the graduate level. Enrollment in BIOL 543 in Spring 2014 was 13 students; however, only 2 were graduate students.

3. **APPROVAL HISTORY**: This course was previously taught in Spring 2012 and Spring 2014 as BIOL 435. Enrollment in Spring 2012 was 28 students.

4. **SCHEDULING AND PROPOSED INSTRUCTORS:** To be offered on Tuesday and Thursday afternoons from 1:30 to 2:45 in the Spring Semester of even numbered years.

   Semester of Initial Offering: Spring 2016

   Proposed Instructors: Dr. Rebecca Forkner

5. **TENTATIVE SYLLABUS**: See attached.

TROPICAL ECOLOGY
BIOL 443
Spring 2016

Instructor: Dr. Rebecca Forkner
3016 David King Hall
Email: rforkner@gmu.edu
Phone: (703) 993-4683
Office hours: Tuesday & Thursday, 12:00 a.m. – 1:00 p.m.

Lectures: Tuesday & Thursday, 1:30 – 2:45 p.m.

Textbook: Kricher, J. (1997) A Neotropical Companion: An introduction to the animals, plants and ecosystems of the New World tropics. 2nd ed. Princeton University Press, New Jersey. (recommended text only, additional reading material will be on reserve at the Johnson Center Library)

Course objectives:

The purpose of this class is to introduce you to the basic scientific concepts of tropical biology, including the origin of tropical forests, their structure, diversity and continental variability. After finishing this course, you should be able to

1) Describe the specific planetary, climatological, geological and geographic conditions that define the "tropics" and dictate their locations. This includes being able to discuss how plate tectonics have contributed to current differences in forest composition on different continents.
2) Describe and give examples of the major types and locations of terrestrial and aquatic tropical habitats, and explain how tropical environments differ from temperate or other non-tropical habitats in structure, diversity, and function. This includes being able to explain how lowland tropical wet forests differ from other tropical habitat types.
3) Describe the physical structure of and ecological and evolutionary processes that maintain tropical rainforest plant communities, and list and describe some common types of plant life forms unique to the tropics. This includes being able to discuss what abiotic and biotic aspects contribute to the high productivity of tropical forests and how these factors differ from those of temperate forests.
4) Describe the patterns of tropical plant and animal diversity. This includes being able to a) give examples of plant and animal taxa endemic to specific areas, b) discuss continental differences in the types of plant and vertebrate taxa present, and c) explain the role of evolutionary convergence or divergence in creating similarities and differences in different continental tropical regions
5) Discuss the abiotic and biotic processes that are hypothesized to create and maintain patterns of tropical biological diversity.
6) Identify and describe contemporary indigenous tropical cultures, and explain the major threats to tropical forests and their inhabitants. This includes being able to identify conservation issues relevant to different continental and marine tropical regions.

Syllabus (tentative):

Date	**Topics Covered**	**Readings**
Jan 21	Tropical Geography & Climate	Kricher – Ch.1, Leopold (1924)
Jan 23	Tropical Regions & Historical Biogeography	Kricher – Ch. 2
Jan 28	Tropical Habitats & Representative sites	Kricher – Ch. 11
Jan 30	Tropical Habitats & Representative sites	Kricher – Ch. 12, pg 422 – 446
Feb 4	Tropical Plants: Structure & Adaptations	Kricher – Ch. 3
Feb 6	Tropical Plants: Diversity	
Feb 11	Tropical Plants: Diversity	
Feb 13	Tropical Productivity and Soils	Kricher – Ch. 10
Feb 18	**Exam I**	
Feb 20	Tropical Animals: Birds	Kricher – Ch.7, Thompson (1989)
Feb 25	Tropical Animals: Mammals I	
Feb 27	Tropical Animals: Mammals II	
March 4	Tropical Animals: Old World Primates	
March 6	Tropical Animals: New World Primates	
March 18	Tropical Animals: Reptiles & Amphibians	
March 20	Tropical Animals: Insects	
March 25	Tropical Plant-Animal Interactions	Kricher – Ch. 8
March 27	**Exam II**	
April 1	Hypotheses of Diversity	Kricher – Ch 4 & 5
April 3	Hypotheses of Diversity	Kricher – Ch. 6
April 8	Aquatic habitats: Rivers & Floodplains	Kricher – Ch. 12, pg 446 – 462
April 10	Aquatic habitats: Lakes, mangroves, coral reefs	Kricher – Ch. 12, pg 463 – 468
April 15	Tropical Islands	
April 17	Tropical Human origins	Kricher – Ch. 13
April 22	Tropical Cultures: Contemporary cultures I	
April 24	Tropical Cultures: Contemporary cultures II	
April 29	**Exam III**	
May 1	Tropical Conservation: Value of Tropics	Kricher – Ch. 14 & 15
May 13	**Comprehensive Final, 12:00 – 2:00 p.m.**	