



Course Approval Form

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

Action Requested:

Create new course Inactivate existing course

Modify existing course (check all that apply)

Title Credits Repeat Status Grade Type

Prereq/coreq Schedule Type Restrictions

Other: _____

Course Level:

Undergraduate

Graduate

College/School: Department:

Submitted by: Ext: Email:

Subject Code: Number: Effective Term: Fall Spring Summer Year:

(Do not list multiple codes or numbers. Each course proposal must have a separate form.)

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

New Fulfills Mason Core Req? (undergrad only)

Currently fulfills requirement

Submission in progress

Credits: (check one) Fixed Variable or Repeat Status: (check one) Not Repeatable (NR) Repeatable within degree (RD) Repeatable within term (RT)

Maximum credits allowed:

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

Schedule Type: (check one) Lecture (LEC) Lab (LAB) Recitation (RCT) Internship (INT)

Independent Study (IND) Seminar (SEM) Studio (STU)

Prerequisite(s):

CHEM 211, Math 113 or equivalent, BIOL 308, PHYS 243 or permission of instructor

Corequisite(s):

Instructional Mode:

100% face-to-face

Hybrid: ≤ 50% electronically delivered

100% electronically delivered

Restrictions Enforced by System: Major, College, Degree, Program, etc. (include code)

Equivalencies: (check only as applicable)

YES, course is 100% equivalent to:

YES, course is being renumbered to/will replace the following:

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)	
The course provides an overview and introduction of challenges and opportunities that urban environments present to the plants and animals inhabiting cities and the ways that those organisms and entire ecosystems respond. The course teaches ecosystem ecology for engineered ecosystems along with reviews on urban metabolism, energy budgets, water cycles, and soil ecology. Creating and restoring green infrastructure is discussed.		The course will require students to design and conduct a small-scale green infrastructure experiment/project on the campus.	
Indicate number of contact hours:	Hours of Lecture or Seminar per week:	Hours of Lab or Studio:	
	<input type="text" value="2hrs 40 min."/>	<input type="text" value="2hr sand 40 min."/>	
When Offered: (check all that apply) <input checked="" type="checkbox"/> Fall <input type="checkbox"/> Summer <input checked="" type="checkbox"/> 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
BIOL	Larry Rockwood		
CEIE	Liza Durant		

For Graduate Courses Only

Graduate Council Member _____ Provost Office _____ Graduate Council Approval Date _____

Course Proposal Submitted to the College of Science Curriculum Committee (COSCC)

The form above is processed by the Office of the University Registrar. This second page is for the COSCC's reference. Please complete the applicable portions of this page to clearly communicate what the form above is requesting.

FOR ALL COURSES (required)

Course Number and Title: BIOL442 Urban Ecosystems and Processes

Date of Departmental Approval: sometime in October 2016

FOR INACTIVATED/REINSTATED COURSES (required if inactivating/reinstating a course)

- Reason for Inactivating/Reinstating:

FOR MODIFIED COURSES (required if modifying a course)

- Summary of the Modification:
- Text before Modification (title, repeat status, catalog description, etc.):
- Text after Modification (title, repeat status, catalog description, etc.):
- Reason for the Modification:

FOR NEW COURSES (required if creating a new course)

- Reason for the New Course: There is a great need among students to learn more about urban ecosystems, and ecological principles for the built environment.
- Relationship to Existing Programs: This course provides unique opportunity to learn more about urban environment that has been extensively altered by human activities, which leads to altered water cycles, foods and waste production, and energy budgets. The course harnesses recent interests among students who would like to learn more about urban sustainability and aims to provide fundamentals for urban ecosystem ecology, including lectures and review on the nexus of water, energy, and foods (soils), including a hands-on project on green infrastructure.
- Relationship to Existing Courses: This course captures the essence of systems ecology applied to urban environment, relating to such existing courses in ESP curricula as Ecological Sustainability, Ecosystem Restoration, Freshwater Ecology and Ecological Engineering.
- Semester of Initial Offering: Fall 2017
- Proposed Instructors: Dr. Changwoo Ahn
- Insert Tentative Syllabus Below

Urban Ecosystems and Processes

INSTRUCTOR: Dr. Changwoo Ahn
Professor of Environmental Science and Policy
OFFICE: 3034 David King Hall (office hour: by appointment)
PHONE: (703) 993-3978
E-MAIL: cahn@gmu.edu
WEBSITE: <https://esp.gmu.edu/faculty-staff/faculty-bios/changwoo-ahn/>
<https://ecoscienceplusart.wordpress.com/>

TA: TBD
CLASS TIME: Lecture/discussion: 4:30 -7:10 pm, **Wednesday**
Fields/Lab: **Saturday** 10:30AM-1:10 PM

CLASS LOCATION: **IN 323**
IN 323 / Ahn Wetland Mesocosm Compound/Fields
(Friday lab/fields if necessary since most activities will be outdoors and trips)

CREDIT HOURS: 4

PREREQUISITE: CHEM 211 General Chemistry, Math 113 (calculus) or equivalent, BIOL 308 Ecology, PHYS 243 College Physics. In case of not meeting prerequisite requirements permission of instructor is required to take the course. Please see me if you have any questions concerning this.

COURSE DESCRIPTION: This undergraduate/graduate course will provide an overview and introduction of challenges and opportunities that urban environments present to the plants and animals inhabiting cities and the ways that those organisms and entire ecosystems respond. The course describes general ecosystem ecology for engineered ecosystems along with review on urban metabolisms, energy, and the ecological footprint. In addition, the course focuses on urban water cycles and nutrient dynamics that are critical in urban ecosystem restoration involving streams, rivers, and wetlands. The course will engage students in studying up-to-date information on green infrastructure planning and applications. The objective of this course is to provide you with an introduction of system modeling approach on designing and managing urban ecosystems.

COURSE OBJECTIVES: the course is intended to involve students in:

- 1) A firm grasp of ecological principles for the built environment by *studying* relevant contemporary issues through peer-reviewed journal articles and other literature;
- 2) An understanding of system approaches of designing and planning urban ecosystems and ecological processes to create and restore ecosystem services with water, energy, and food and/or;
- 3) Designing and conducting a small-scale green infrastructure experiment/project on the campus or in local areas

REQUIRED TEXT:

Frederick R. Alder and Colby J. Tanner, 2013. Urban Ecosystems –Ecological Principles for the Built Environment

RECOMMENDED TEXT

COURSE FORMAT: Class will be a mixture of lecture, intensive paper reading and discussion, case studies presentation, class discussion, and urban ecosystem design projects with presentations. I expect you to complete the assigned readings prior to each class. Each class participant will be required to participate in a class project and prepare presentations on the outcomes of the project. Grades will be based on paper review summary, field trip report, mid-term, group activities for design project, final project presentation. The course may also involve one longer, field trip, depending on logistics (TBD).

READING ASSIGNMENT FOR CLASS AND PAPER DISCUSSION:

Each student is required to read papers or book chapters assigned before class, submit a summary of the paper (2 pages-1000 words limit, single spaced, 1" for all margins), and get ready for lecture and group discussion. Your summary of the chosen paper should include **two** questions minimum (not included in 1000 words limit) of yours at the end of the summary on terminology, concepts and interpretation of the results presented in each paper. This will require you to do some research on-line or through library materials to share the answers with the rest of the class. One group will present the summary of the paper chosen for your review (individual or group activity) in class for 10-15 minutes (ppt presentation) to be followed by the lecture and discussion. The group that presents a paper summary will lead a discussion session after the presentation. The list of papers will be provided by the instructor.

URBAN ECOSYSTEM PROJECT:

Students will work as a group (e.g., 2-3 students per group) develops from scratch an ecological model of an urban ecosystem to create or restore, including green infrastructure and ecosystem processes to be supported by it. The final project for each student can be to develop a research paper or a grant proposal (following NSF Environmental Sustainability proposal format). Students will be required to complete the following on their project:

1. an oral presentation of their concepts and design
2. An electronic copy (via emails) of written manuscript (either for a paper or a proposal)
*There will be a lecture on the styles and formats to strictly follow on the final project material for both proposals and research papers.

The project proposal should include the topic, a conceptual model, and on-going literature review..

FINAL PAPER AND PRESENTATION:

Each student is required to write a research paper on a specific subject of urban ecosystem processes with literature review as part of the class for grades. Specifics on the subject and the format will be explained and discussed during the course of the class. Power point presentation of each paper is also required (15-20 minute presentation and 5 minutes Q &A). Students are allowed to use a variety of media, including photos, videos, and web blog to be created to tell a story of the project with further discussion with the instructor. Email me ppt files at least a couple of days before final presentation or earlier for my feedback.

HANDOUTS: Copies of papers and other documents will be handed out in conjunction with class lectures. Unless otherwise noted, students are generally responsible for material contained in these handouts for course examinations.

COURSE POLICY AND EXPECTATIONS: Class attendance is strongly recommended. Be punctual. Lateness is disruptive and disrespectful to your peers and to me. There will be strong emphasis on active and effective **participation** in class discussions, not only during the class presentations and discussion periods following these presentations, but also throughout all the other class periods. I expect each of you to be present and prepared for each class. This will involve having read the assigned material before each class. I strongly recommend not to use your cell phones during the class. *Academic dishonesty* will not be tolerated (honor code responsibilities). *Minor changes in course organization and content* may be required throughout the semester,

thus students will be made aware and asked for input if such actions are needed. Late assignments will not be accepted.

LET ME KNOW if you have any documented learning or other disability and wish to discuss academic accommodations. The Disability Resource Center can also help you or direct you toward help with a wide range of learning, studying, mental health, career, and physical disability issues (located in Student Union Building I, Room 2500; Tel: 703- 993-2474; <http://ods.gmu.edu/>).

CLASS E-MAIL AND COMMUNICATIONG WITH ME:

I will frequently e-mail to remind you of deadlines or to clarify points from a lecture. Please use GMU e-mail (**@gmu.edu) to facilitate any communication or discussion. Please check your e-mail **daily**. When you email your assignments be sure to label your file with your last name and date (e.g., ahn0205-355). If you email a question of general interest, I will likely send my response to the entire class list. Be sure to take full advantage of your classmates, the library, and the web as learning resources. Finding answers and solutions among yourselves by tapping into the multitude of resources available to you is generally a more gratifying and educationally valuable approach than seeking answers from a single authority.

GRADING:	% of Grade
Reading assignment and discussion (I/G)	30 (25/5)
Mid-term (I)	20
Fields trip/field works/design exercise (I/G)	20
Final Project (I/G) and presentation (G)	30
TOTAL POINTS	<hr/> 100

I: Individual, G: Group

- Failure to meet deadlines for reading assignment and final paper submission will result in losing 5% of total points for letter grade.

LECTURE COURSE SCHEDULE:

Date	Topic
Aug 27	Course Overview, Research tools (library sources), Research Project, engineered ecosystems Student backgrounds, syllabus orientation, group assignment, research topics & sites
Sep 3	Urban ecosystems and the science of ecology, Literature review assignment
Sep 10	Urban habitats and organisms
Sep 17	The goal of urban ecology
Sep 24	Urban metabolism and Ecological footprints
Oct 1	Urban energy budgets
Oct 8	Urban ecological footprint
Oct 15	No class (Columbus Day Recess)

Oct 22	Mid-term
Oct 29	Urban processes –water cycles, mid-term review
Nov 5	Urban water cycles
Nov 12	Urban Soils – nutrient dynamics with food production
Nov 19	Urban Soils 2- nutrient dynamics with food production
Nov 26	Urban biodiversity –invasive species and biotic homogenization
Nov 30	Student research project presentation

FINAL PAPER DUE: NOON, DEC 11

LAB COURSE SCHEDULE (subject to minor change):

Date	Locations	Topics and activities
Aug 31	No lab/fields	
Sep 7	Syllabus, Tour to Wetland Mesocosm Compound and Ecological Observatory Area	
Sep 14	US Botanic Garden (Sustainable Sites Initiative (SITES) and Landscapes for Life) –Ray Mims and James Willmott	
Sep 21	No lab/fields	
Sep 28	US Green Building Council/WSSI Green Building tour –rainwater harvesting	
Oct 5	No lab/fields	
Oct 12	Project design and planning charrette	
Oct 19	No lab/fields	
Oct 26	Field trip to local green infrastructure project (TBA)	
Nov 2	No lab/fields	
Nov 9	Urban Ecosystem Project –Individual or group work on a research project	
Nov 16	Urban Ecosystem Project –Individual or group work on a research project	
Nov 23	Final project progress review	
Dec 3	Student presentation	

