



# 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

Fixed:  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):

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)

<b>Description</b> (No more than 60 words, use verb phrases and present tense) Provides an overview of the challenges and opportunities that urban environments present to the plants and animals inhabiting cities and the ways that those organisms and entire ecosystems respond. Includes ecosystem ecology for engineered ecosystems, along with reviews of urban metabolism, energy budgets, water cycles, and soil ecology. Students design and conduct a small-scale green infrastructure experiment/project on campus.	<b>Notes</b> (List additional information for the course) This course will co-meet with EVPP 542. Undergraduate students in this course will be graded according to a different rubric than the graduate students.
Indicate number of contact hours: Hours of Lecture or Seminar per week: <input type="text" value="3"/> Hours of Lab or Studio: <input type="text" value="3"/>	
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		

### 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.

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### **FOR ALL COURSES** (required)

Course Number and Title: EVPP 442 Urban Ecosystems and Processes

Date of Departmental Approval: sometime in March, 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 a unique opportunity to learn more about urban environments that have 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. The course is relevant to both Environmental Science (BS) for its concentrations of Conservation, Ecological Science, Environmental Health, and Human and Ecosystem Response to Climate Change and Environment and Sustainability Studies (BA) for its all concentrations.
- Relationship to Existing Courses: This course captures the essence of urban systems ecology applied to urban environment management and design, relating to such existing courses in ESP curricula as Ecological Sustainability, Ecological Engineering and Ecosystem Restoration, and Freshwater Ecosystems. Yet none of those courses mentioned deal with cities and urban environment, including built environment.
- 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  
3034 David King Hall (office hour: by appointment)  
**OFFICE:** (703) 993-3978  
**PHONE:** cahn@gmu.edu  
**E-MAIL:** <https://esp.gmu.edu/faculty-staff/faculty-bios/changwoo-ahn/>  
**WEBSITE:** <https://ecoscienceplusart.wordpress.com/>

**TA:** TBD  
**CLASS TIME:** Lecture/discussion: 4:30 -7:10 pm, **Wednesday**

**CLASS LOCATION:** Fields/Lab: **Saturday 10:30AM-1:10 PM**  
**IN technology classroom (each student needs a computer)**  
**EXPL L502**

**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. Especially, 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 through field trips and visits. The objective of this course is to provide you with an introduction of system 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**

Travis Beck. 2013. Principles of Ecological Landscape Design. Island Press  
Meg Calkins. 2012. The Sustainable Site Handbook. Wiley

**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. Your final paper is due by December 7.

**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 COMMUNICATING 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.

### **LABS & FIELD TRIPS:**

Students are required to participate in scheduled field trips and fieldworks, and to do lab assignment as necessary. Field trips are usually scheduled for Saturdays 10:30 AM – 1:10 PM and on-campus lab sessions (in L502, EXP) for Saturdays between 10:30 AM –1:10 PM as well. Based upon previous experience field trips to the locations may end by around 12:45 PM. One field trip scheduled to visit Green Homestead in Culpeper VA will take a longer drive that will require students to be able to leave at least an hour from the campus to get to the location by 10:30 AM. All other locations are within 30 minute to less than an hour from the campus (either by car or by Metro (to DC)). L502 can be made available later on in the semester while each student group will be working on its class project if needed. Additional work in any of lab or fields should be arranged with both Dr. Ahn and Dr. Ahn’s designated graduate student as necessary for your class project. Limited yet laboratory space for your class project work, if needed, can be made available in Ahn Wetland Ecosystem Lab 1(3071 David King Hall) and Lab 2 (3079a). Coordination with Dr. Ahn on lab and equipment use is imperative. I don’t expect any time conflict for our field trips with other classes you may be taking, but if so please let me know ahead of time so that I can adjust to make necessary changes in scheduling.

Most field trips involve visiting green buildings, homestead, and green infrastructure sites with significant portion being indoors. However, for one or two field trips that may involve walking on fields you may want to wear shoes that can get wet or soiled. Transportation will not be provided for local field trips, car-pooling is strongly recommended. The cost of food (water and lunch) and your share of the transportation costs (i.e., gas) are at your own expense. Field trips usually

**Also needed for field trips may include** field notebook (e.g., paper or electronic –phone, pads), pencil, calculator, old clothes and boots/shoes for fieldwork, rain gear upon weather conditions

### **LAB REPORT**

Each field lab will require a short written report (2 pages; 800 - 1000 words limit) that will be due by next field/lab session. Specific instruction will be provided for each field trip with addresses and directions for the locations a week prior to the trip

### **GRADING:**

### **% of Grade**

Reading assignment and discussion (I/G)	30 (25/5)
Mid-term (I)	20
Fields trip report/design exercise (I/G)	20

Final Project Paper (I) and presentation (G) 30 (20/10)

TOTAL POINTS 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:

<b>Date</b>	<b>Topic</b>
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Aug 27	Course Overview, Research tools (library sources), Research Project, engineered ecosystems Student backgrounds, syllabus orientation, group assignment, research topics & sites
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Sep 3	Urban ecosystems and the science of ecology, Literature review assignment
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Sep 10	Urban habitats and organisms
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Sep 17	The goal of urban ecology
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Sep 24	Urban metabolism and Ecological footprints
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Oct 1	Urban energy budgets
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Oct 8	Urban ecological footprint
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Oct 15	No class (Columbus Day Recess)
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Oct 22	<b>Mid-term</b>
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Oct 29	Urban processes –water cycles, mid-term review
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Nov 5	Urban water cycles
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Nov 12	Urban Soils – nutrient dynamics with food production
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Nov 19	Urban Soils 2- nutrient dynamics with food production
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Nov 26	Urban biodiversity –invasive species and biotic homogenization
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Nov 30	<b>Student research project presentation</b>
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Dec 7	<b>FINAL PAPER (= Final exam) DUE</b>
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**LAB COURSE SCHEDULE (subject to minor change):**

<b>Date</b>	<b>Locations</b>	<b>Topics and activities</b>
Aug 31		Orientation, working group assignment
Sep 7	Ahn Wetland Mesocosm Compound and Ecological Observatory Area-Urban campus green area building and maintenance	
Sep 14	US Botanic Garden, Washington DC (Sustainable Sites Initiative (SITES) and Landscapes for Life) –Ray Mims and James Willmott (guided tour)	
Sep 21		No field trip scheduled – individual group work
Sep 28	WSSI Green Building Tour (Gainesville, VA) – urban stormwater management and rainwater harvesting	
Oct 5	Green Homestead Project (Culpeper, VA; host: Lenna and Pete Storm)	
Oct 12		Class project design and planning charrette (L502, Exploratory Hall)
Oct 19	Fairfax City Hall (Stormwater and Sustainability Division, Alexander Christina-Stormwater Management Engineer for City of Fairfax)	
Oct 26	American Landscape Architecture Building Green Roof Tour, Washington DC	
Nov 2	Urban Ecosystem Project –Individual or group work on a research project	
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 and discussion (L502, EXP)
Dec 3		Student presentation (L502, EXP)

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