COURSE TITLE: **ALIEN INVADERS: All About Invasive Species**

NO. OF CREDITS:	**5 QUARTER CREDITS**	**WA CLOCK HRS:**	**50**
	[semester equivalent = 3.33 credits]	**OREGON PDUs:**	**50**
		CEUs:	**5.0****

INSTRUCTOR: **EVA VARGA, M.A.**
541/388-5004
eva_varga@me.com

COMPLETION DATE:
6 months from your registration date.

LEARNING ENVIRONMENT:
This course requires assignment responses to be posted in a password-secured ONLINE website hosted by The Heritage Institute.

COURSE DESCRIPTION:
Invasive non-native plants and animals are changing the landscape of the United States, coming in as a result of globalization of transportation and trade, and putting U.S. ecosystems and lands at an increasingly greater risk of damage due to invaders. Weeds take over important habitat areas for wildlife, devastating shelter and forage while reducing the diversity and quantity of native plants. Non-native animals out-compete endemic and native species for food and thereby upset the natural balance.

Teachers at all K-12 grade levels can integrate lessons on the cultural, historical, ecological and economic impact of invasive species into their curriculum. This course will provide field experiences in the region of choice and thereby enable teachers to become familiar with their local habitats and the threats of non-native species therein. Text fee will vary with your choice of books and bookseller.

LEARNING OUTCOMES:
Upon completion of this course, participants will:

1. Have prepared a field journal of observations and discoveries to use as a basis for instructional planning as well as a reflection tool.
2. Have developed drawings or taken photos of at least 12 non-native species of plants and/or animals that threaten their local ecosystems.
3. Have observed first-hand the biological diversity of their local area and how these non-native species threaten the balance and complex ecology.
4. Have talked with resource specialists to learn about the strategies they are using to eradicate invasives and their efforts to combat the threats they impose.
5. Have prepared lesson plans to use this information in classroom instruction.

COURSE REQUIREMENTS:
Participants will complete assignments and post responses online to specific questions outlined for each assignment. Completion of all specified assignments is required for issuance of hours or credit. The Heritage Institute does not award partial credit.

****HOURS EARNED:**
Completing the basic assignments (*Section A. Information Acquisition*) for this course automatically earns participants their choice of 50 Washington State Clock Hours, 50 Oregon PDUs or 5 CEUs (Continuing Education Units), which translates to 50 hours. The Heritage Institute is an approved provider of Washington State Clock Hours, Oregon PDUs, and CEUs by IACET (International Association of Continuing Education and Training, an official national and international certifier of CEUs).

UNIVERSITY QUARTER CREDIT INFORMATION:

• UNIVERSITY QUARTER CREDIT OPTION 400 & 500 LEVEL

Teachers may opt to register for five (5) Antioch University, Seattle, 400 or 500 level quarter credits, instead of hours, and will be required to:

1. Complete all assignments for clock hours/CEUs (*Section A: Information Acquisition*)
2. Complete the extra reading/viewing, writing and classroom application assignments specified in the syllabus for the 400 or 500 level credit option (*Section B: Learning Application*)
3. Complete an Integration Paper by answering five (5) questions (*Section C: Integration Paper)*

• REQUIREMENTS FOR UNIVERSITY QUARTER CREDIT

Antioch University Seattle requires 75% or better for credit at the 400 level (Upper Division) and 85% or better to issue credit at the 500 level (Post-Baccalaureate). These criteria refer both to the amount of work submitted as well as the quality of work as determined by each instructor

1. Completion of Information Acquisition assignments 30%
2. Completion of Learning Application assignments 40%
3. Completion of Integration Paper assignment 30%

• CREDIT/NO CREDIT (No Letter Grades or Numeric Equivalents on Transcripts)

Antioch University Seattle Continuing Education Quarter credit is offered on a Credit/No Credit basis; neither letter grades nor numeric equivalents are on a transcript. 400 level credit is equal to a "C" or better, 500 level credit is equal to a "B" or better. This information is stated on the back of the transcript.

ADDITIONAL COURSE INFORMATION

COURSE MATERIAL and/or TECHNICAL REQUIREMENTS:

You will need high-speed (DSL) Internet access in order to easily view online resources. Some of the reading materials may be provided in the online course environment as PDF documents, a format readable by computers with Adobe Acrobat Reader. You may download a free copy of Acrobat Reader from our website, if it is not already on your computer.

REQUIRED TEXTBOOK:

Cost will vary with your selection of 2 books from the Bibliography.

GETTING STARTED:

- Once you have registered for the course, you will be sent an email that contains the website address, password and course key that you need to access your online course, along with instructions on how to log into the online system.
- The assignments listed in this syllabus are also listed at the bottom of each online course document. Access each assignment and enter your responses online. We suggest that you write your responses in a WORD document and then do a copy/paste function into the Responses box.
- When you have completed all assignments for the course, CLICK the 'ALL ASSIGNMENTS COMPLETED' option. The instructor will be notified that you have completed all assignments.
- The instructor will review your work and enter responses online. You will be emailed when the instructor has marked the course completed, and you will be instructed to log in and view the instructor's comments. Then you can also SAVE a complete copy of the assignments and responses.

NOTES TO ALL PARTICIPANTS:

- Unlike a live workshop, you are not required to be present (i.e. online) at specific days or time, participants will work at their own pace.
- All responses will be posted online. Large documents or files may be attached as part of your response by using the "Share A File" option.
- To maintain privacy, please do not refer to students in your papers by their actual names, but rather use an alias or designation such as "Student A."

ASSIGNMENTS for CLOCK HRS/PDUs, CEUs, 400 or 500 LEVEL UNIVERSITY QUARTER CREDIT

A. INFORMATION ACQUISITION

Assignment # 1:
Conduct research on non-native species, specifically those in your local area. Conduct research about the ecology of your selected area using course bibliography, library, bookstores and the World Wide Web. This research will provide insight into the focus of your project proposal. Record your findings in a journal noting the name, location, effect on the local ecology and a photo of at least three species. In the online response box summarize your journal notes. You may upload photos using the "Share A File" option.

Assignment # 2:
Create a list of five (5) interview questions to ask the resources specialists for numerous agencies (Forest Service, Fish & Wildlife, Bureau of Land Management, Soil & Water Conversation District, Watershed Councils, etc.). Interview three resource specialists and report their responses to your questions in a 2-3 page paper. Post your paper in the online response box.

Assignment # 3:
Select one book from the bibliography to read and write a 2-page reaction paper in which you describe what aspects of your reading may be applicable to your professional situation.

Assignment # 4:
Visit three distinctly different local habitats (e.g. open meadow or field, coniferous forest, deciduous forest, riparian area, stream, etc.) and make observations of the vegetation. Maintain a journal of your observations. This will provide you with a detailed record of your experiences.
Include a variety of 12 drawings, photographs, facts and personal reactions. Address these issues in your journal:

a) Describe and give examples of any symbiotic relationships encountered during your field experience.
b) Compare the distinctive features of the three habitats you selected.
c) Discuss the history of the area, addressing both natural and human impacts (i.e. forest fire, landslides, dams or dikes, major restoration work, etc.).
d) Identify any non-native plants or animals present.
e) Identify the economic impact these non-native species will have if left 'un-checked'.
f) Discuss the effects of the introduction of non-native species in these ecosystems.
g) Create a glossary of ecology words you learned.

When complete, transfer your notes, drawings and photos to a digital report which you can upload using the "Share A File" option.

Assignment # 5:
Create a resource list that you will use with students. Post your resource list in the online response box or upload your document. It should include:

a) Fact Sheets with graphics/photos on some of the more prominent local invasive species.
b) A bibliography of printed materials.
c) A list of web sites and
d) Any other materials you feel would be useful in lesson planning.

Assignment # 6:
Go to www.squidoo.com to research invasive species. Write a 1-page commentary on how you can use squido.com with your students.

This completes the assignments required for Washington Clock Hours, Oregon PDUs, or CEUs.

Continue to the next section for additional assignments required for University Quarter Credit.

ADDITIONAL ASSIGNMENTS REQUIRED for 400 or 500 LEVEL UNIVERSITY QUARTER CREDIT

B. LEARNING APPLICATION

Assignment # 7:
(400 and 500 Level)
Select one of the books listed in the bibliography (different than the one used in assignment #3), or a book of your own choosing (with the instructor's prior approval). Write a 2-3 page paper in which you summarize the main points of the chapters you read and indicate what ideas, resources and statistics cited could be useful in your classroom.

Assignment # 8:
For 400 Level – Complete Part A only
For 500 Level – Complete Part A and Part B

Part A: (400 & 500 Level)
Create a project proposal that you can use in your classroom. This should cover a minimum of two-weeks instructional time. This assignment will guide you in selecting one of several options to help you integrate the learning from this online course into your classroom.

Choose **ONE (1)** of the following:

1) Have students create video segments which could be compiled together in a class video to teach others about invasives. You may consider publishing this on *YouTube*. Post the URL to your YouTube (or another) site in the online response box.

OR

2) Engage students in a community-based service-learning project whereby they take action to control invasive weeds in their community. This could be done as a whole-class, in small groups, or individually. Write a 2-page summary of the project; include an outline of the project and results.

OR

3) Using either the *Lesson Plan Template* attached or your district's lesson plan format, prepare a 5-6 lesson unit on any aspect that integrates what you've learned in this course with your teaching situation. Post your lesson plans in the response box or upload using the "Share A File" Option.

OR

4) Choose another application assignment of your own with the instructor's prior approval.

Part B: (500 Level only)
In addition to the 400 level work, Choose **ONE (1)** of the following options:

1) Prepare a narrated slide presentation, videotape, or instructional unit on some aspect of invasive behavior. The unit should also include support materials, lesson plan, worksheets, evaluation, etc. Upload the support materials, plan and worksheets to the online response box.

OR

2) Prepare a presentation to be made to colleagues at a local, state or regional conference that focuses on a local invasive species problem and how to involve students. Upload your presentation outline and any handouts developed.

OR

3) Develop a *Squidoo-lens* http://www.squidoo.com to use in your classroom that informs your students and their parents about the invasive species specific to your area. Post your URL in the online response box.

OR

4) An assignment of your own design with prior approval from the instructor.

ADDITIONAL ASSIGNMENTS REQUIRED for 400 or 500 LEVEL UNIVERSITY QUARTER CREDIT

C. INTEGRATION PAPER

Assignment # 9: Integration Paper
(Required for 400 and 500 Level Credit)
Complete the requirements for university quarter credit by submitting a final Integration Paper of 2-3 pages.
A heading is required; please use the following format.

Your Name:	Date:
Course Name:	Course Number:
# of Credits:	Level: (400 or 500)
Advisor Name:	

Respond to each of the 5 questions below. (First list the question and then write your answer)

1. What did you learn vs. what you expected to learn from this course?
2. What aspects of the course were most helpful and why?
3. What further knowledge and skills in this general area do you feel you need?
4. How, when and where will you use what you have learned?
5. How and with what other school or community members might you share what you learned?

INSTRUCTOR COMMENTS ON YOUR WORK:
Be sure to mark the "All Assignments Completed" section in the online course environment as this will notify the instructor that you have completed the course.
Upon receiving notification of your completion of all course assignments, your instructor will provide written comments online.

QUALIFICATIONS FOR TEACHING THIS COURSE:
Eva Varga, M.A., born and raised in Oregon, has a deep respect for history and nature. Her father instilled the knowledge of tree identification and an appreciation for geography and natural resources at an early age. As an undergraduate, she pursued a dual degree in General Science and International Studies. During this time, she spent a summer abroad in San Miguel de Allende, Mexico. Thereafter, she began graduate work at Oregon State University in Elementary Education, earning a Master of Arts in Teaching degree.

She taught for six years in the public schools (four as an elementary science specialist and two as a fifth grade classroom teacher) and has received numerous awards and grant honors for the development and integration of non-native species curriculum. In 2002, she was selected as an Oregon state finalist for the Presidential Award of Excellence for Math and Science Teaching. She has also volunteered with an *Earthwatch* team studying parasitism of rainforest caterpillars in Ecuador.

ALIEN INVADERS
BIBLIOGRAPHY & SUGGESTED READING LIST

BOOKS

Boersma, P. Dee. *Invasive Species in the Pacific Northwest*. University of Washington Press. 2006.
Invasive Species in the Pacific Northwest examines invasive species of fish, plants, invertebrates, mammals, and birds, such as the American bullfrog, blackberries, domestic cats and pigs, European fruit flies, Japanese eelgrass, Mediterranean mussels, rats, and terrestrial mollusks. For each of 108 species, the book includes: Species description and current range, Impacts on communities and native species, Control methods and management, Life histories and species, and a History of invasiveness.

Bright, Chris. *Life Out of Bounds*. WW Norton & Company. 1998.
Bio-invasion, or "the spread of exotics" as Bright terms it, causes both economic and ecological disasters. Bright discusses the increasingly urgent issue of invasive exotic plants and animals and their ecological impact worldwide on native species. An excellent introduction to the field, loaded with historical examples and heavily referenced.

Coates, Peter. *American Perceptions of Immigrant and Invasive Species: Strangers on the Land*. University of California Press. 2007.
Introduced species have transformed our ecosystems and are creating anxiety among environmentalists and the general public. But is American anxiety over this crisis of ecological identity a recent phenomenon? Exploring shifting attitudes to alien species since the 1850s, Peter Coates brings to light the rich cultural and historical aspects of this story by situating the history of immigrant flora and fauna within the wider context of human immigration.

Cox, George W. *Alien Species and Evolution: The Evolutionary Ecology of Exotic Plants, Animals, Microbes and Interacting Native Species*. Island Press. 2004.
Biologist George W. Cox reviews and synthesizes emerging information on the evolutionary changes that occur in plants, animals, and microbial organisms when they colonize new geographical areas, and on the evolutionary responses of the native species with which alien species interact. The author draws on examples from all parts of the world and all major ecosystem types, and the variety of examples used gives considerable insight into the patterns of evolution that are likely to result from the massive introduction of species to new geographic regions that is currently occurring around the globe.

Drake, Jane, and Ann Love. *Alien Invaders: Species That Threaten Our World*. Tundra Books. 2008.
Written for children in grades 3-6, the authors introduce three classic examples of alien invaders: brown rats, cane toads in Australia, and the fungus that caused the potato blight in the U.S. and Ireland. Ten more species are described with a narrative that describes the invader, its life cycle, the damage it causes, and attempts to control it. Further chapters focus on vulnerable habitats, the potential threats of pandemics, and perspectives on the impact of these species and what people are doing and can do to control them.

Elton, Charles S. *The Ecology of Invasions by Animals and Plants*. University of Chicago Press. 2000.
Much as Rachel Carson's *Silent Spring* was a call to action against the pesticides that were devastating bird populations, Charles S. Elton's classic *The Ecology of Invasions by Animals and Plants* sounded an early warning about the invasion of nonnative species. In it he explains the devastating effects that invasive species can have on local ecosystems in clear, concise language and with numerous examples.

Lockwood, Julie, Martha Hoopes, and Michael Marchetti. *Invasion Ecology*. Wiley-Blackwell. 2006.
This book provides a comprehensive introduction to all aspects of biological invasion by non-native species. Highlighting important research findings associated with each stage of invasion, *Invasion Ecology* provides an overview of the invasion process from transportation patterns and causes of establishment success to ecological impacts, invader management, and post-invasion evolution.

Taylor, Ronald J. *Northwest Weeds: The Ugly and Beautiful Villians of Fields, Gardens, and Roadsides*. Mountain Press Publishing Company. 1990.
Northwest Weeds describes and illustrates the weeds of the northwestern United States and adjacent Canada. Full-color photographs and the accompanying text emphasize the weeds' identifying characteristics. The book includes information on the origin, distribution, aggressiveness, and edibility of each weed.

Whitson, Tom D. *Weeds of the West*. Diane Publishing Company. 2006.
Weeds of the West is an extensive, easy-to-use guide written by seven extension specialists and published by the Wyoming Agricultural Extension. The authors describe early growth stages, stages of maturity, and features for the positive identification for each weed.

Uva, Richard H., Joseph C. Neal, and Joseph M. Ditomaso. *Weeds of the Northeast*. Cornell University Press. 1997.
This book provides clear descriptive text and photos. The authors have included photos of seedlings and seeds of each species as well as a section on common weed tree seedlings.

Wilson, Edward O. *The Diversity of Life*. WW Norton & Company. 2000.
Wilson, an eminent Harvard entomologist, details the rise of biodiversity on earth and the human threats to it. In short, Wilson offers with this book a simple, workable environmental ethic that extends the work of other conservationists. His eloquent plea to save the rich variety of plant and animal life will resonate with readers of all ages and educational backgrounds.

ONLINE MEDIA

Bureau of Land Management: Invasive Species
http://www.blm.gov/education/LearningLandscapes/explorers/lifetime/invasive.html
A list of web resources compiled by the Bureau of Land Management. Includes links to specific state agencies.

Bureau of Land Management: How to Prevent the Spread of Noxious Weeds
http://www.blm.gov/education/weed/weed.html
A site developed by the Bureau of Land Management to educate the public about the threats imposed by non-native invasive weeds. Includes suggestions for hands-on learning activities in the classroom.

Invasive Plant Education
http://www.weedcenter.org/
The Center for Invasive Plant Management is a regionally focused center based at Montana State University. They work in partnership with county, state, and federal agencies, tribes, nongovernmental organizations, private industry, commodity groups, and academic institutions. Their website provides links to factual information as well as teaching resources.

The Global Invasive Species Team
http://www.invasive.org/gist/
Part of The Nature Conservancy's response to abating the damage caused to native biodiversity by the human-facilitated introduction of non-native, harmful invasive species. This web site provides many resources designed to help all conservationists deal most effectively with invasive species.

National Geographic Expeditions: Invasive Species.
http://www.nationalgeographic.com/xpeditions/lessons/14/g68/newsinvasive.html
Sample lesson plan on invasive species developed by the National Geographic Expeditions.

National Geographic Expeditions: Aquatic Invaders
http://www.nationalgeographic.com/xpeditions/lessons/14/g68/invaders.html

Another National Geographic Expeditions sample lesson plan, this one focusing on aquatic invasive species.

United States Forest Service: Celebrating Wildflowers
http://www.fs.fed.us/wildflowers/index.shtml
The Celebrating Wildflowers website provide information about events, wildflower viewing areas, wildflower photos, native plant information, and pollinators. Page links include just for kids, coloring pages, teacher resources, ferns, rare plants, plant of the week, pollinator of the month, invasive plants, and wildflower links.

University of Hawai'i Botany Department: Impact of Alien Plants on Hawai'i's Native Biota
http://www.botany.hawaii.edu/faculty/cw_smith/impact.htm
Of the thousands of plant species introduced to Hawai'i, less than 2% have become serious pests of the native ecosystem. Developed by the University of Hawai'i Botany Department, this site explores the impact of these invasives species on Hawai'i's native biota.

University of Hawai'i Botany Department: Hawaiian Native Plant Genera
http://www.botany.hawaii.edu/faculty/carr/natives.htm
An index of native Hawaiian plants, organized according to genera. Includes the name of the plant in native Hawaiian.

University of Hawai'i Botany Department: Hawaiian Alien Plant Studies
http://www.botany.hawaii.edu/faculty/cw_smith/aliens.htm
A list of web pages featuring alien plant species that are among the greatest threats to Hawaiian biota.

Wildlife Habitat Council: Growing Native
http://www.wildlifehc.org/managementtools/backyard-growingnative.cfm
The Wildlife Habitat Council is a nonprofit, non-lobbying group of corporations, conservation organizations, and individuals dedicated to protecting and enhancing wildlife habitat. This site provides several sample lesson plans that can be adapted to your classroom.

THE HERITAGE INSTITUTE
ONLINE COURSE
LESSON PLAN TEMPLATE

Grade Level: _____

Subject: _____

Theme/Topic: _____

Student Outcomes: *(with Connection to State Standards*)

Required Materials and Equipment:

Agenda: (*The major events of the day posted for public viewing. Schedule warm-up, bathroom breaks, surprises (pop quiz), guest speakers, specials, assemblies, movie clips, outside assignments etc. so students can manage their time with you.)*

Warm Up: *(A one to two sentence task, written or drawn on the board, to be completed alone or in groups prior to the beginning of the lesson. At the elementary level it would be used for classroom transitions, and in grades 7-12 to define one content area from another. The warm-up is designed to access learning from the previous lesson and settle students into the flow for the present lesson on hand.)*

Anticipatory Set: *(Attention Getter to kindle student interest)*

Direct Instruction (10-20 mins): (*Input, Modeling/demo, giving directions, check for understanding)*

Guided Practice (x mins): (*Under teacher's direct supervision, students individually apply or practice what they have just learned and receive immediate feedback)*

Closure (x mins): (*Actions designed to cue in students that they have arrived at an important point in the lesson or at the end of the lesson; often closure consists of review and clarifying key points*)

Independent Practice: (*Student directed, may be incorporated before closure or as outside assignment. The aim is repetition in enough different contexts so that the learning may be applied to any relevant situation, not only the context in which it was originally learned.)*

Assessment and Follow-Up: (*Self-reflection, collaborative rubric, other rubric, anecdotal evidence, teacher created quiz/test etc., peer review, standardized test, exhibition, portfolio piece(s))*