METHODS OF FIELD BIOLOGY FOR EDUCATORS: Monarch Butterfly Ecology and Research

Geared towards K-12 educators!

Instructor: Julie Hein-Frank

Schedule: Tuesday & Thursday, July 15 & 17, 2014 (9:00 a.m.-4:30 p.m.).

July 16 and 18 will be the back-up dates in the event of bad weather.

Location: Sevastopol School District, 4550 Wisconsin 57, Sturgeon Bay, WI 54235, and other field location.

This course will begin at Sevastopol School in Sturgeon Bay. Participants will travel to various sites in Door County as part of this course (most likely within a 30 mile radius). Participants are responsible for transportation to other field trip sites.

Choose from Two Enrollment Options:

One (1) Graduate Credit

Course #: ED & HUD 795-6, 7409 (#0181D)

Prerequisite: Graduate Standing (Must have earned a bachelor’s degree)

Noncredit

Program #: 0181ND

Prerequisite: Must have earned a bachelor’s degree.

Course Description:

This course provides in-depth study of special topics through immersive field sessions where participants explore, develop questions, learn techniques, and experience authentic scientific research. The course provides a unique opportunity to increase content knowledge and explore focused topics in biology, ecology and natural history through hands-on field investigations.

This course is designed for educators who are interested in gaining subject matter content knowledge and integrating inquiry oriented, experienced-based studies into their educational program. Participants will learn ecological field study techniques and participate in and create studies in their local environment.

We will explore ecological relationships, biodiversity and conceptual approaches that are used by field biologists to investigate ecological patterns and processes. Participants will further develop
content knowledge, expertise and inspiration that will deepen their practice of authentic scientific inquiry in the classroom. We will also investigate the role of Citizen Science in today’s ecological studies and the Scientist-Student-Teacher (SST) partnership. After the course, teachers will enrich their classrooms with deeper content knowledge, innovative projects and materials and authentic field experiences to share with their students.

**Course Emphasis:** Topic: Monarch Butterfly Ecology and Research

Monarch Butterfly Ecology and Research will provide content knowledge and practice in authentic scientific inquiry through field investigations while exploring ways these experiences can be translated into instructional practices. The study of monarch ecology will serve as a framework for a deeper understanding of general ecological principals, processes and inquiry. We will explore population dynamics and the natural history of the species. We will participate in data collection, practice field method techniques on adult butterflies and larvae and design plant/organism interaction studies. We will also consider the broader concepts of nectar resource availability and the phenology of milkweed plants and the effects of a changing climate.

We will investigate current research, the cultural, social and economic issues that surround the species and the status of the migration as an endangered biological phenomenon. We will discuss how deepening the study of the monarch butterfly life history can translate into strengthened opportunities for inquiry for both the participant’s professional growth and student understanding of the practices of scientists through the processes of authentic scientific inquiry.

**Rationale - Why Methods of Field Biology for Educators?**

“*Teachers learn by doing, reading and reflecting (just as students do); by collaborating with other teachers; by looking closely at their work and by sharing that they see...*” Darling-Hammond and McLaughlin (1995)

Immersion in a field experience and in the practices of scientists provides teachers with opportunities that allow them to expand and stay on top of new content knowledge, to gain science process skills, and to experience the same kind of scientific inquiry that is expected of their students. McCarty, R.V. (2001) recommends that professional development for teachers “must not only assure that teachers come to understand the nature of science through actual research experience in the field, but help them to build new and personal visions of what it means to practice science in the contexts of their own classrooms” (p. 5).

Oberhauser states in *Effecting Change in Science Classrooms* (2005) “Teachers need to become confident with the content and processes they are to facilitate with their students. The importance of professional development in providing teachers with rich content and numerous opportunities to experience the learning that they are expected to facilitate with students may serve to assist them in translating inquiry practices to their own classrooms.”

A number of researchers (Birman et al., 2000; Darling-Hammond & McLaughlin, 1995; Garet, Porter, Desimone, Birman, & Yoon, 2001; Loucks-Horsley et al., 1998) have echoed how important it is that professional development provides teachers with rich content and opportunities to practice what they are learning through field method experiences.
Course Objectives - Participants will:

- Investigate the natural history and evolution of the monarch butterfly.
- Explore and experience hands-on scientific inquiry through field methods.
- Demonstrate understanding of new content by application in the field.
- Understand the value of authentic scientific inquiry as it relates to professional development and science education.
- Discuss the strengths and drawbacks of field methods and authentic scientific inquiry as a classroom tool.
- Review and analyze existing research on the monarch butterfly and develop a critical analysis of current reports.
- Explore topic specific project opportunities available for educators and students.
- Reflect on and explain how one would translate the inquiry based experiences of this course to the practice of classroom teaching.

Required Readings:

- Journal articles as assigned

Examples of required journal article readings to be provided by the instructor:


Pleasants, John M. ; Oberhauser, Karen S. Milkweed loss in agricultural fields because of herbicide use: effect on the monarch butterfly population, Insect Conservation and Diversity, 2013, Vol.6(2), pp.135-144


Recommended Readings:

http://www.scientificamerican.com/article.cfm?id=climate-change-herbicide-may-doom-monarch-butterfly-migration


Course Requirements, Evaluation, and Assessment:

**Graduate Credit Students – 150 possible points**

- **In-Class Participation and Attendance:** Participants will attend all class sessions and actively engage in all fieldwork, discussions and activities. (50 pts)
- **Critical Analysis Paper:** Participants will write 1 critical analysis paper based on assigned journal articles relevant to the course topic as provided by the instructor. (50 pts)
- **Follow up Reflection:** A foundation of professional development for teachers is the application of course content into the participant’s classroom. Participants will prepare a written reflection to the instructor that describes how they will translate their inquiry based field experiences and course content into their instructional practices. (50 pts)

**Graduate Credit Grading Scale:**

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<th>Grade</th>
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<tr>
<td>A</td>
<td>141-150</td>
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<tr>
<td>AB</td>
<td>132-140</td>
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<td>BC</td>
<td>117-125</td>
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<td>C</td>
<td>111-116</td>
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<td>CD</td>
<td>102-110</td>
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<td>D</td>
<td>91-101</td>
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<td>F</td>
<td>90 points and below</td>
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**Noncredit Students**

- **Attendance and In-Class Participation:** Participants will attend all class sessions, actively engage in activities, and participate in discussions.
- **Reflection Paper:** Participants will write one reflection paper regarding how information from this course will be used in their classroom.

**Certificate of Completion:** Noncredit students will earn a certificate of completion upon satisfaction of the noncredit requirements.

The following Wisconsin Teacher Standards are *addressed* for the Noncredit Students and *assessed* for the Graduate Students:

1. Teachers know the subjects they are teaching
4. Teachers know how to teach.
6. Teachers communicate well.
9. Teachers are able to evaluate themselves.
10. Teachers are connected with other teachers and the community.

*February 27, 2014 - CL*