Eco-Informatics
WLF693 (Fall 2009)
(version 5 August 2009)

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Office hours: 10:15 a.m. – 12:15 pm on Wednesday

TA: TBA

Lecture: Monday and Wednesday 10:30 – 11:35 a.m., 207 Irving 1
Lab: Friday 14:15 p.m. - 17:15 p.m., 103 Irving 1

Course Web Page: http://courses.uaf.edu

Course Description: The discipline of Ecology has greatly progressed last decades, and so has Informatics. Ecosystem-based Management of Wildlife represents the scheme of the day, and data, computing and the internet offer great opportunities to advance such a management and sustainability world-wide. This course will deal specifically with data, computational and online applications in the discipline of Wildlife and Habitat Ecology. It will provide the core themes of Eco-Informatics, such as databases (design and query), data mining, machine-learning, modeling, optimization algorithms (MARXAN), data flow, Open Access data sharing, predictions, visualizations, data policies, in-depth analysis and publication credits for data and manuscripts. It will also focus on analysis in space and time, as well as cloud computing, Biodiversity Metadata, web functionalities such as Genbank, Geographic Information Systems (GIS), Google Earth/Ocean and basics of Remote Sensing. This course will further introduce students to the use of SQL, R, S, XML and similar programming & tagging languages and software packages. It caters graduate-level needs but is also open to other disciplines and advanced undergraduates. Lectures will introduce and explain these relevant Eco-Informatics topics, and a lab will allow to explore, learn and follow-up. This course is specifically designed for motivated students that like inquiry-based learning with the computer (usually online) for Wildlife applications, and who want to apply Eco-Informatics to Ecology, Evolution, Alaska, science, their thesis projects, as well as global sustainable management questions of natural resources.

Course Goals: Students will learn modern core principles and techniques of Eco-Informatics and be able to know and apply relevant details. This course presents the required foundation for upper level courses in a professional research setting. I expect motivated, professionally behaving and fast thinking students because this course involves advanced technology and learning many software packages for real-world applications; it is designed to help students entering the profession of a modern Wildlife Biologist and Researcher.

Pre-requisites: Undergraduate course in ecology or wildlife management, e.g. for UAF students BIOL 271 ‘Principles of Ecology’, WLF201 ‘Principles of Wildlife Management’, BIOLF469/F669 ‘Landscape Ecology and Wildlife Habitat’, graduate
standing or permission of instructor. Knowledge about Statistics (e.g. STAT F200 or F300) and software is an asset. Students without necessary prerequisites are subject to faculty initiated withdrawal (FIW) from this course. Students are also required to fully collaborate, appear punctual to lectures/labs and assignments, attend all laboratories, and hand in assignments in time. Students missing lectures, labs and assignments also may be subject to FIW.

Credits: 3

Grading Policy: Letter grades will be determined from the performance in labs (25%: attendance, paper discussion, performance test), several quizzes (8%), one midterm (12%), two term projects (20%; database project, data mining) and one final exam (35%). The two exams will be based on 15 multiple-choice and 5 qualitative questions. The labs will involve computing applications that require pass/fail and 4 lab assignments with short written reports (handed in digitally). The projects should cover a specific question involving Ecology and Informatics (details to be discussed with the instructor). The new UAF grading policy applies. I can offer extra credits.

Note: This course will make use of (public) software, extensive data sets and advanced data mining techniques. Inquiry-based approaches at the internet and data investigations are promoted. Be prepared to receive a professional editorial review on your digital work and via email and Blackboard. Late assignments will receive a grade of 0. Special arrangements or a doctor’s evaluation of illness are required to make up a test or other assignment. I reserve the right to add additional tests, quizzes or assignments if students do not come to lecture and lab prepared. I reserve also the right to curve tests if I deem this appropriate. You are expected you to do your own work in accordance with the UAF Student Code of Conduct (http://www.uaf.edu/catalog/current/academics/reg3.html). Cheating and plagiarism are very serious offenses, and will not be tolerated. Any exam or paper that contains plagiarized material will receive a grade of zero. Be sure you understand what constitutes plagiarism and cheating (see below for help on this). Any student who turns in a paper not written by him/herself (such as purchased from a company or downloaded from the Internet) will flunk the entire course. The Rasmuson Library has prepared materials to help you better understand how to properly cite sources. For an explanation of what constitutes plagiarism see: http://www.uaf.edu/library/instruction/handouts/Plagiarism.html
For an explanation of how to properly cite sources see: http://www.uaf.edu/library/instruction/handouts/Citing.html
Any details presented in this course outline can be subject to change.

Readings: The course will closely follow the standard journal reference:

Biodiversity Informatics
https://journals.ku.edu/index.php/jbi

Recommended Books (referred to in lectures, labs and assignments. Not required; but for the interested student):


Other references will be relevant as well for this course (see below).

**Supplies required:** Computing environment (word processing, printer, Open Office, R, USB stick and internet access), notebook, pen.

**Disabilities Services:** The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. I will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodation to students with disabilities.