RREN 312 - Aquatic Field Techniques
Credits: 3     Lec: 2     Lab: 3
Intranet: Q:\Nrc\RREN 312 AqFldTech
Term: Fall Semester, 2012

INSTRUCTOR: Professor William Snyder
107 Bicknell Hall,
Office Phone: 315-684-6237
E-mail: SnyderW@morrisville.edu
Office Hours: MWF 10-11; RF 11-12

PREREQUISITES: NATR 250

COURSE DESCRIPTION: A comprehensive study of sampling theory and methodologies currently used in the aquatic sciences. Course specifically addresses research sampling considerations and strategy design; sampling and characterization of lake, river and wetland ecosystems; aquatic vertebrate, invertebrate, and flora collection techniques; watershed and catchment delineation; and, aquatic ecosystem remediation techniques. Course includes field dress and safety, field data management, watercraft operation, system modeling and biometry, and reference collection curation.

MAJOR COURSE OBJECTIVES: Upon completion of this course, the student will be able to:

1. prepare and conduct a field operation, observing guidelines of strategic planning and safety;
2. maintain and operate watercraft and observe watercraft safety;
3. accurately describe and characterize a drainage basin;
4. accurately describe and characterize a stream in terms of reach, channel morphometry, flow, and bankfull stage;
5. accurately describe and characterize a riparian zone in terms of corridor dimensions and bank conditions;
6. identify and delineate stream channel microhabitats;
7. identify, describe and bathymetrically map lake basins;
8. create a valid fish sampling strategy appropriate to sampling objectives and gear available;
9. accurately describe and characterize fish communities and populations based on diversity and structural indices; and,
10. conduct a field research investigation and literature search on a specific aquatic habitat, utilizing valid, scientific reference materials, and then communicate those findings in both written and oral forms.

REQUIRED TEXTS: Aquatic Habitat Assessment: Common Methods, Bains & Stephenson
Glossary of Aquatic Habitat Inventory Terminology, Armantrout
RREN 312 Supplemental Course Materials Packet

STUDENT REQUIRED EQUIPMENT: 3-ring binder for handouts; scientific calculator, notebook and texts; hand lens; chest waders and appropriate dress for scheduled sampling operations (lab exercises will be conducted regardless of weather).
SYLLABUS:

Week 1
Lec 1.1: Introduction to Course; 4 “Knows” of Effective Field Habits
Lec 1.2: Research, Management & Sport; The Management Process
Lab: Canoe Handling Skills; Canoe Rescue; Boat and Trailer Preparation; Trailer Handling

Week 2
Lec 2.1: Sampling Theory and Design – part 1: Top Down Planning
Lec 2.2: Sampling Theory and Design – part 2: The Costs of Sampling
Lab: Boat Launching; Boat Handling; Rules of the Road; Water Rescue

Week 3
Lec 3.1: Sampling Theory and Design – part 3: Designing the Sample
Lec 3.2: Sampling Theory and Design – conclusion
Lab: Water Sampling; Water Quality Testing and Analysis

Week 4
Lec 4.1: Sampling Physicochemical Parameters: Temperature, Dissolved Oxygen & pH
Lec 4.2: Sampling Physicochemical Parameters: Dissolved Solids, BOD, ORP
Lab: Sampling Fish Populations; Net Handling

Week 5
Lec 5.1: Biological Parameters: Rate Functions & Population Dynamics
Lec 5.2: Population Dynamics: Mortality
Lab: Fish Community Sampling: Population Estimation: Multiple Run Depletion Sampling

Week 6
Lec 6.1: Population Dynamics: Growth
Lec 6.2: Population Dynamics: Recruitment
Lab: Use of Statistics in Sampling I

Week 7
Lec 7.1: Population Dynamics: Conclusion
Lec 7.2: Midterm Examination I
Lab: Use of Statistics in Sampling II

Week 8
Lec 8.1: No Lecture – Columbus Day Break
Lec 8.2: Overview of Fish Sampling Equipment
Lab: No Lab - Columbus Day Break

Week 9
Lec 9.1: Analysis of Length Data: Modal Analysis
Lec 9.2: Analysis of Length Data: Stock Densities
Lab: Interpretation of Fish Population Data: Length-based Indices

Week 10
Lec 10.1: Analysis of Weight Data: Condition Factors
Lec 10.2: Analysis of Weight Data: Relative Weights
Lab: Interpretation of Fish Population Data: Weight-based Indices

Week 11
Lec 11.1: Analysis of Age and Growth Data
Lec 11.2: Hard Parts Analysis
Lab: Interpretation of Fish Population Data: Hard-Parts Analysis

Week 12
Lec 12.1: Midterm Examination II
Lec 12.2: Introduction to Riverine Ecosystems
Lab: Stream Channel Morphology

Week 13
Lec 13.1: Riverine Habitat Differentiation
Lec 13.2: Riverine Habitat Descriptive Models
Lab: Stream Flow and Discharge Comparisons

Week 14
Lec 14.1: Assessing Substrate and Cover
Lec 14.2: No Lecture: Thanksgiving Break
Lab: Instantaneous Particulate Retention Coefficients

Week 15
Lec 15.1: Role of Flooding: Channel development
Lec 15.2: Macro- and MicroHabitats
Lab: Riverine Microhabitat Analysis

Week 16
Lec 16.1: Role of Flooding: Modeling Bankfull Stage
Lec 16.2: Sampling the Human Component
Lab: Watershed Delineation

NOTE 1: Syllabus subject to change at the professor’s discretion
NOTE 2: This is a field course. Twelve of the fifteen labs will be conducted outdoors, regardless of weather conditions. This is a required, non-negotiable portion of this course. Be prepared.
EVALUATION OF THE STUDENT

Evaluation is a shared responsibility between the teacher and the student. The purpose of the evaluation is to demonstrate how well the professor has taught and the student has learned specific course materials, the principles, concepts and terms relevant to the renewable resources and environmental science field, and to determine the students' ability to apply that knowledge to specific situations.

STUDENT BEHAVIOR: As students in technical program preparing for a professional career, all students are expected to conduct themselves, in both manner and dress, as professionals.

Eating, drinking, or the consumption of any tobacco products is prohibited in the classroom situation (lecture hall, classroom, or in-field). Doing so may result in the student's dismissal from that class period and will count as an unexcused absence.

Cell phones, pagers, etc. must be turned off during the instruction time. Use of or disruption of class by these devices will result in the confiscation of the device by the instructor, and may result in the student's dismissal from that class period and will count as an unexcused absence. The confiscated device may be retrieved at University Police.

GRADE METHOD: All laboratory periods will have a graded component or exercise. Additionally, each student will be evaluated each lab period in terms of field preparedness (readiness, dress, equipment), performance and participation.

Homework assignments will include data analyses and interpretation, critical review of journal articles and research opportunities. The students can expect unannounced quizzes at any time, with at least one quiz per week.

Two midterm exams and one final lecture exam will be given during the lecture period.

Field study/research effort will be required by the student. This effort will consist of student participation and ability relative to established performance-based criteria, qualitative assessment of data collected, and the production of data analyses and laboratory reports.

The course will be graded upon the following distribution:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes, Labs, Homework</td>
<td>30%</td>
</tr>
<tr>
<td>Field Preparedness/Performance</td>
<td>5%</td>
</tr>
<tr>
<td>Midterm exam I</td>
<td>20%</td>
</tr>
<tr>
<td>Midterm exam II</td>
<td>20%</td>
</tr>
<tr>
<td>Lecture final</td>
<td>25%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Extra credit projects will not be granted except in the most extreme of mitigating circumstances. Student effort applied to extra credit projects will only serve to distract the student from the fundamental course competencies.

GRADING SCALE:

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 - 94%</td>
<td>A</td>
</tr>
<tr>
<td>93 - 90%</td>
<td>A-</td>
</tr>
<tr>
<td>89 - 87%</td>
<td>B+</td>
</tr>
<tr>
<td>86 - 83%</td>
<td>B</td>
</tr>
<tr>
<td>79 - 77%</td>
<td>C+</td>
</tr>
<tr>
<td>76 - 73%</td>
<td>C</td>
</tr>
<tr>
<td>72 - 70%</td>
<td>C-</td>
</tr>
<tr>
<td>69 - 65%</td>
<td>D+</td>
</tr>
<tr>
<td>64 - 60%</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 60%</td>
<td>F</td>
</tr>
</tbody>
</table>

ATTENDANCE: Students are required to attend scheduled lectures, labs, and field trips; and to work on class and field assignments as scheduled by the professor. Students are required to attend their scheduled sections for labs, lectures, and examinations, unless authorized by the professor.
Certain lab or class assignments may require students' attendance at a time other than their regular scheduled class period. The professor will do all in his power to inform the students of such scheduling in a timely manner so as to make appropriate arrangements to their work and social schedules. These labs are not optional, thus attendance is required.

If a student must leave class early during a regularly scheduled meeting, he/she must discuss reasons with the professor. If a student must miss a scheduled class meeting due to an acceptable, verifiable time conflict, he/she must resolve the time conflict prior to class.

If a student is unable to attend class because of an emergency, the professor or School of Agriculture and Natural Resources office must be contacted prior to the scheduled class meeting. The telephone number is 684-6237 (Mr. Snyder) or 684-6083 (School office).

Students failing to call ahead or discuss absences prior to the class will be unexcused. **If a student accumulates four unexcused absences, he/she will be given the option of dropping the course or receiving a failing grade for the quarter.** This policy is absolute and non-negotiable.

**STUDENTS WITH DISABILITIES:** If you are a student with a documented disability, who wishes to use academic accommodations you should do the following:

1. Speak with me during the first two weeks of class*.
2. Talk with David Symonds, Coordinator of Services for Students with Disabilities to arrange your test accommodations. You may reach David at 684 6349 or E-mail symondda@morrisville.edu

If you wish to use test accommodations for an exam please speak with me the class before each exam. Doing this will help me accommodate you. All tests must be completed the same day the test is scheduled. Any other arrangements must be made by agreement between the student and the instructor.

**ACADEMIC ASISTANCE:** The Academic Enrichment Center (AEC) is a resource available to all students who need assistance with their coursework. The AEC offers peer tutoring in most subjects as well as professional tutoring in math, reading, and English/writing. Supplemental instruction is also available in a number of courses. The tutors and professional staff at the AEC can also assist students with general study skills such as note-taking, test-taking, time management, and critical thinking. The AEC is located in Butcher Library and can be reached at 684-6042.

**HONESTY POLICY & DISCIPLINE (Due Process):** Honesty and integrity are major elements in professional behavior and are expected of each student. Cheating is considered unacceptable behavior within all University courses. Students having academic problems should consult with their advisor or a college counselor. Instances of cheating will be dealt with in accordance to University policy. Standards of academic honesty and due process procedures for Morrisville College are located in the college Rules and Regulations handbook.

**SAFETY GUIDELINES:** Certain class assignments will require the student to be absent from the professor's immediate supervision. Whether the student is under immediate supervision or not, safe conduct and safe use of equipment shall be the ultimate rule. Failure to comply with prudent safety practice and/or willful disregard for class participants and/or equipment may be cause for immediate dismissal from that particular class session by the professor. Subsequent similar activity may be cause for dismissal from the course by the School Dean.

*Le hasard ne favorise que les esprits prepares.*

Pasteur