OGLALA LAKOTA COLLEGE

Course Syllabus for
NaS 373 Techniques for Watershed Assessment
Spring 2014

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Course Description: Water quality and quantity are central sovereignty issues for indigenous peoples. In this course, students will learn stream evaluation techniques and aquatic ecology theory in order to characterize and quantify stream health.

Course Goal: Students will learn watershed and stream evaluation techniques and aquatic ecology theory in order to characterize and quantify stream health.

Course Objectives:

- Students will be able to describe physical and chemical properties of freshwater ecosystems;
- Students will be able to describe aquatic food sources and energy flow in freshwater ecosystems;
- Students will be able to describe the general structure and function of freshwater communities;
- Students will be able to identify common locally occurring freshwater invertebrates to family level;
- Students will be able to relate physical, chemical, and biological factors contributing to watershed health.

Recommended Prerequisites: Math 154, Chem 233, NSci 253 completed with a grade of "C" or better. GIS 213 is a recommended co-requisite.

Required Textbooks: Giller, Hauer, R. Richard and Lamberti, Gary A. (2007). Methods of Stream Ecology, Second Edition. Academic Press. 896 pages. ISBN: 0123329080

Supporting Texts (not required): Texts published by the US EPA and available for download from the EPA website. Aquatic ecology journal articles

Descriptive Reading Load: Grade14 reading level. Students are expected to read approximately one chapter a week.

Types and Amounts of Writing Expected: The nature of this course offering requires you write professionally. A course outcome will be that all students will be required to submit a publishable scientific abstract at the end of the semester.

Lakota Perspective: This course stresses **Wolakotakiciapi** or "learning Lakota ways of life in the community". Understanding aquatic ecosystems requires patience and quiet observation.

Participants in this course are expected to practice respect for each other, the instructor, and for all living and natural things that are used during this course. We will also apply knowledge gained through the course to improving the health of the community through service learning.

Course Requirements: This course is somewhat different than other courses. We are applying a constructivist approach (e.g. shorter lectures, and more (mostly) independent research) with a focus on dissemination.

Weekly Course Outline: The general outline for each class is as follows:

Hour 1 Short quiz over last week's reading
Informal presentations by groups on progress
Hour 2: Lecture over new material – about 1 chapter per week
Hour 3: Working together to solve problems with our individual research
Look at methods / understand issues / challenges / etc.

Projects will include the use of aquatic ecology data that has already been collected rather than the collection of new data. These data include:

water quality data,
macroinvertebrate data,
stream stage data
GIS data,
Dissolved oxygen data
Riparian physical habitat data
Stream flow data from USGS gaging stations
And an algal accrual model

Grading: Grading for this class will be made up of the following areas:

In Class and Homework Assignments	25%
Weekly Quizzes	25%
Semester Project - Abstract and Poster	25%
Cumulative Final Exam	25%
Total	100 %

The following scale will be used:
A = 90% - 100%
B = 80% - 89.9%
C = 70% - 79.9%
D = 60% - 69.9%
F = below 60%

Assignments: Students are responsible for a minimum of five hours of work tied to their semester project, including a write-up of the week's progress. The weekly homework will be evaluated by effort (e.g. keeping a log of work) – 33%, written report – 33%, and oral presentation – 33% using the scale below.

Class Participation, In-Class, and Take Home Assignment Grading Rubric

Grade	Points	Description
A	8	Meeting work expectations based on abilities.
B	6	Work somewhat meeting expectations for professionalism or content; moderate enthusiasm for course material.
C	4	Work does not meet expectations for timeliness, professionalism, and/or content; low enthusiasm for course material
D	2	Work and class participation shows minimal effort.
F	0	Unexcused absence; no effort to make up missed work.

All homework involving writing should be completed in paragraph form, which consists of: i) a topic sentence; ii) 3-5 body sentences; and iii) a conclusion or transition sentence. Professional ethics requires referencing the author of any text or pictures that are used in assignments.
The semester project is a publishable abstract, a publishable poster, and a short (12 minute presentation). Student's work will be evaluated using OLC STEM department rubrics.

Semester Projects: At the end of the semester each of you will have a publishable abstract, poster, and oral (powerpoint) presentation (of 12 minutes – that means 10-14 effective slides). The oral presentation of work will be for the OST Environmental Tech Team – which includes the OST Environmental Protection Program (EPP), Natural Resources Regulatory Agency (NRRA), and other partners. We will consider each project to meet the standards of service learning.

Course Philosophy: You are not studying and learning for the instructor, but for yourself. Grades are important for your academic career; nevertheless, your professional life really begins after you graduate. Understanding rivers will help you not only in your professional career, but also to understand and appreciate your surroundings and life itself.

This is a continuing course in environmental science. This is your chance to start build onto your existing knowledge and to excel in it. However, what you take away from this course is ultimately up to you the student. You have to invest your time into learning. The instructor will work to provide time within the allotted class period for students to work on homework in a collaborative fashion.

Tips to Succeed in this Course:
Read chapters **before** trying to do the homework or the quiz. Then it will be much easier for you to follow the online lecture and to use online forums to ask questions about material that you did not understand.

Do not just "read" your textbook. Keep good notes in a separate notebook that you can use to study for the final exam. Use your notebook to comprehend new concepts and define new terms **in your own words.** This notebook will be useful for studying for the final exam.

Homework will include essay questions. Be sure that you can define (in full, comprehensible sentences) any new concepts and key terms when reading through a chapter so that you can use these terms in a meaningful way in your homework.

When you do your assignments, go back through the appropriate chapters and read them carefully a second time to find the answers.

Actively take part in the class laboratories and discussion. This will help you solve problems in your homework in a collaborative fashion.

Weekly Schedule

Week Number	Topic	Assignment
1	Overview	
2	Chapter 1 – Landscapes and Riverscapes	
3	Chapter 2 – Valley Segments, Stream Reaches and Channel Units	
4	Chapter 3 – Discharge Measurements and Streamflow Analysis	
5	Chapter 5: Temperature, Light and Oxygen	
6	Chapter 9 – Phosphorus Limitation, Uptake, and Turnover of Benthic Stream Algae	
7	Chapter 10 – Nitrogen Limitation and Uptake,	
8	Chapters 11-13 – Organic Matter	
9	Chapters 15-16 – Benthic Algae	
10	Chapter 20 - Macroinvertebrates	
11	Chapter 23 – Primary Producer – Consumer Interactions	
12	Chapter 25 – Trophic Relationships of Macroinvertebrates	
13	Chapter 28 – Primary Productivity and Community Respiration	
14	Chapter 35 – Macroinvertebrates as Biotic Indicators of Environmental Quality	
15	Final Exam	
Makeup	Semester Project Presentations	Semester Project Due

Note: The instructor reserves the right to make changes. Students will be informed of any such change.