Soil Resources and Conservation  
AGRN 5083/6086  
Syllabus

Credit Hours: 04  
Instructor: Dr. Dennis A. Shannon  
Email: shannda@auburn.edu  
Telephone: 334-844-3963  
Pre-requisites: AGRN 2040 Basic Soil Science (or equivalent), Senior standing.

Required Text:

Required Materials:
- Videos of laboratory sessions – provided online in Blackboard
- Videos & Films – provided online in Blackboard
  - Wind erosion
  - Conservation tillage
  - Earthworms
  - No-Till
  - Guest Lecture – 1 – Ben Moore
  - Guest Lecture – 2 – Eve Brantley
  - Guest Lecture – 3 – Earl Norton
- Booklets mailed by Auburn University
- Other materials mailed by Auburn University

Course Overview:

This course covers topics related to land use planning and the management of soils as a resource for sustainable crop production, urban and industrial development, and environmental protection. In the first unit, we will cover various ways to assess land for agricultural and other uses, the long-term consequences of land use, soil erosion by water and by wind, and soil and water conservation measures. The second unit will cover soil quality for agriculture and soil assessment for non-agricultural uses. The third unit will cover wetlands. The fourth unit will deal with water related issues: non-point source (NPS) pollution and best management practices for abatement of NPS pollution, and finally stormwater management.
Objectives of Course:

- Provide sound principles and procedures for planning the wise use and management of soil resources for agricultural and non-agricultural purposes.

Course Content:

There are 21 topics spread across four units including four open book and one proctored final examinations. You are expected to read the assigned textbook readings, lecture outlines, watch lecture presentations in the form of Microsoft PowerPoint, take self-quizzes, work on and watch videos of laboratory demonstrations. More information is given about these activities in the Course Requirements section in this document. The proctored final examination is taken under the supervision of an approved proctor. The Distance Learning & Outreach Technology (DLOT) office of Auburn University verifies the proctors for the examinations. More information about the proctors is given in the Examination Process section in this document.

A variety of media provided by Blackboard are used for communication among class members and the instructor. These are online submission of assignments, email, and discussion board.

Course Topics:

The topics in this course are as follows:

Unit I: Land Use, Soil Erosion and Conservation

Section 1: Soil Resources
1. Historical Overview - World & United States, Worldwide importance of soil resources and conservation
2. Land Resource Regions & Major Land Resource Areas, National Resources Inventory, Land Capability Classification

Section 2: Soil Erosion and Sedimentation
3. Geologic and water erosion and sedimentation
   3A. Geologic Erosion and Sedimentation - Accelerated Erosion and Sedimentation
   3.B. Water Erosion and Sedimentation
4. Wind Erosion and Sedimentation

Section 3: Predicting Soil Loss
5. Predicting Wind Erosion: Wind Erosion Equation
6. Predicting Water Erosion
   6A. Universal Soil Loss Equation
   6B. Soil Loss Tolerance
   6C. Other Water Erosion Prediction Models,
   6D. Estimating Gully Erosion

**Section 4: Erosion Control Measures**

7. Erosion Control Measures for Agricultural Lands
   7A. Categories of Erosion Control
   7B. Erosion Control where Water is in Excess
   7C. Erosion Control while Maximizing Water Retention

8. Erosion Control Measures for Agricultural Lands (cont.)
   8A. Terraces and Other Conservation Structures
   8B. Wind Erosion Control
   8C. Requirements for Conservation of Highly Erodible Land
      (Conservation Compliance)

**Unit II. Soil Quality for Agricultural and Non-Agricultural Uses**

**Section 5: Soil Quality**

9. Soil Quality Concepts, Definitions, Overview and Indicators
10. Cropping Systems to Improve Soil Quality and for Carbon Sequestration
  10A. Managing Soil Quality
  10B. Soil Conditioning Index

11. Lecture on Soil Quality by NRCS Agronomist, Ben Moore

**Section 6: Soil Interpretation for Non-agricultural Uses**

12. Potential of Soils for Residential, Commercial and Other Uses – Lecture 1
  12A. Concepts Relevant to Soil Interpretation Ratings
  12B. Soil Interpretation Ratings

  13A. Use of Soil Interpretation Rating Guides
  13B. Soil Interpretation Ratings by Soil Series

**Unit III: Wetlands**

**Section 7 Wetlands**

14. Wetlands Definitions and Classification Systems
  14A. Introduction to Wetlands
  14B. Wetland Classification Systems

15. Wetland Determination and Delineation
  15A. Introduction to Army Corps of Engineers Wetlands Delineation Manual
  15B. Wetland Vegetation
  15C. Wetland Soils
  15D. Wetland Hydrology
  15E. Wetland Determination and Delineation

16. Wetland Regulations and Programs
  16A. Clean Water Act Requirements (jurisdictional wetlands), Wetlands Mitigation Banking, Drainage of Non-wetlands
Unit IV: Influence of Soil Management on Water Quality

Section 8. Nonpoint Source Pollution
17. Non-Point Source (NPS) Pollution: Definitions, Overview and Pollutants
18. Best Management Practices (BMP’s) for Mitigation of NPS pollution in Agriculture and Forestry
   18A. Categories of BMPs and Control Points
   18B. BMPs Categorized by Pollutants they Control
   18C. Agroforestry Practices and BMPs / USDA Programs that Address NPS Pollution

Section 9: Stormwater Management
19. Stormwater management
   19A. Introduction to Stormwater Management
   19B. Stormwater Management Principles
   20A. Stormwater Regulations (Clean Water Act (CWA) of 1972 and Amendments; Requirements for Stormwater Management; State and Local Regulations Relating to Construction Sites; The Surface Mining Control and Reclamation Act of 1977 (PL - 95-87);
   20B. Stormwater Management Practices
   20C. Estimating Runoff from a Watershed: NRCS
21. Lecture by Eve Brantley on stormwater management, NPS pollution control and water quality.
22. Erosion and Sediment Control Concepts Related to Construction Sites:
   22A. Lecture by Earl Norton
   22B. Materials for erosion control in construction and urban environments

Course Laboratory Sessions:
1. Raindrop Erosion and Site Slope Evaluation
2. Field Inventory of Soil Resources
3. Estimating Soil Loss with USLE equation
4. Using the Revised Universal Soil Loss Equation (RUSLE2) to Compare Soil Erosion Management Strategies
5. Planning Erosion Control Systems for Cropland
6. Evaluating Soil Quality Indicators
7. Planning Cropping Systems using Soil Indices
8. Identifying Wetlands – hydric soils and hydrology
10. Applied Conservation Management Systems in Forests
11. Evaluating Field Suitability for Septic Tank Absorption System
12. Uses of Soil Survey for agricultural and non-agricultural uses
13. Observation of Stormwater Management Systems
14. Applied Conservation Management Systems on Farm
15. Determining Runoff using the NRCS Curve Number System

Suggestions for Study:

The course units are divided into several basic elements: the reading assignment, the lecture outline, the lecture presentation, resources from websites, self-study quizzes. Never rush through a unit. Remember to follow each step specified to achieve the course goal. Some of the reading assignments are very long and include many examples. After reading them, you may wonder if you have mastered the material. In these cases the lecture outline notes should help you to realize if you need to review the reading.

A Note on Using the Lecture Outline:

The lecture notes are not simply an outline of the readings. They are a guide to the most important concepts and terms, some of which are not covered in the readings. They contain the same information as in the Powerpoint presentations, but in a form that should facilitate study. The textbook and other readings present the material from a different perspective and contain information that complement the lectures. I suggest that before you do the readings, scan over the outline in order to get an idea of what you are about to read. Then, after reading and listening to the Powerpoint lectures, check your understanding of the material by again going over the outline. If parts of the material seem confusing, you will have a good indication of what you need to review in the reading. The lecture notes are not a substitute for the reading. They are a tool to use to better understand the material. It also helps to relieve some of the stress involved with learning many new concepts and terms.

Course Requirements:

1. Lectures:

Lecture outlines and lecture presentations for each topic are made available in the course website on Blackboard.

2. Laboratory:

Exercises will cover a number of topics related to the lectures. Videos of field exercises will provide an opportunity to experience a “hands-on” application of principles relating to subjects such as site inventories and evaluations, estimating soil loss, determining highly erodible cropland, determining wetlands, planning erosion control systems on agricultural and nonagricultural lands and field estimates of soil quality attributes. Watch for a video on variety of conservation practices used in the area that are typical of those used in the Southeastern U.S. Reports will be assigned to provide students opportunities to practice and demonstrate principles learned during the laboratory exercises.
3. **Self Study Quizzes:**

There are self-study quizzes available on Blackboard and you are expected to take these as many times as possible to master the content.

4. **Term Paper and PowerPoint Presentation:**

Each student will prepare a written report and an MS PowerPoint presentation on an assigned topic related to one of the lecture topics. The grade for the report and presentation will reflect the quality of the document and the presentation (factors of importance related to the document include extent of relevant information, extent of research through references, organization of materials, clarity and completeness).

5. **Exams:**

You will use the Blackboard for taking these exams. There are four timed open book examinations and a final proctored examination.

6. **Proctored Final Examination:**

The proctored final examination is at the end of course and will be available in the course website on Blackboard. This examination gives you an opportunity to assess your assimilation of the learning objectives of the course. The examination will include material from the assigned textbook readings, lecture outline, quizzes, lecture presentations and laboratory assignments. It will consist of multiple-choice questions, true/false, matching questions and other questions answered by computations and written statements. This is NOT an open book examinations. More information about the proctors is given in the Examination Process section in this document.

**Examination Process:**

After the first session, you must select a proctor to supervise the final examination. Examples of approved proctors are academic administrators in the learner’s locale: school superintendents or principals, academic deans or department heads at colleges, or an independent learning office test supervisor at another college, or an education officer at a military installation. All proposed proctors are verified for appropriateness by Distance Learning and Outreach Technology (DLOT) student services staff at 334-844-3106 or audl@auburn.edu. At the time of the final examination, the proctor and the student fill out the Examination Information Verification form. This form along with any written
material is mailed in a confidential self-addressed sealed envelope to DLOT office.

Grading and Final Examination:

The grade for this course will be based upon four timed exams during the semester, 15 laboratory reports, a term paper and PowerPoint presentation, and a proctored final exam. Graduate students will be expected to present a longer report and cite more references than undergraduate students. The final course grades on all quizzes, laboratory reports, final presentation and exams are determined by the following scale:

Grades:

<table>
<thead>
<tr>
<th></th>
<th>AGRN 5083/4</th>
<th>AGRN 6086</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>10 %</td>
<td>Exam 1</td>
</tr>
<tr>
<td>Exam 2</td>
<td>11 %</td>
<td>Exam 2</td>
</tr>
<tr>
<td>Exam 3</td>
<td>16 %</td>
<td>Exam 3</td>
</tr>
<tr>
<td>Exam 4</td>
<td>10 %</td>
<td>Exam 4</td>
</tr>
<tr>
<td>2 Quizzes</td>
<td>1 %</td>
<td>2 Quizzes</td>
</tr>
<tr>
<td>Laboratory Reports</td>
<td>15 %</td>
<td>Laboratory Reports</td>
</tr>
<tr>
<td>Final Term Paper</td>
<td>8 %</td>
<td>Final Term Paper</td>
</tr>
<tr>
<td>Final Presentation</td>
<td>7 %</td>
<td>Final Presentation</td>
</tr>
<tr>
<td>Final Exam</td>
<td>22 %</td>
<td>Final Exam</td>
</tr>
</tbody>
</table>

90-100% = A (Superior)
80-89%  = B (Good)
70-79%  = C (Acceptable)
60-69%  = D (Passing but unsatisfactory)
below 60% = F (Failure)

The following criteria are used in assessing the letter grades:

A: Shows that the work is superior and exemplary. You have demonstrated that you have mastered the material and have successfully conveyed your mastery in your responses.
B: Shows that the work is good. You have demonstrated that you have a good understanding of the material and can apply that understanding.

C: Shows that you have responded satisfactorily. A response that meets the basic requirements will receive a C grade.

D: Shows that you have responded unsatisfactorily.

F: You have failed to respond correctly.

**Equipment and Technical Skills:**

The following are necessary for this course:
- A computer with an Internet connection
- Knowledge of basic computer skills and experience using email and the internet

**Class Parameters, Resources and Limitations:**

You are expected to stay on track, especially since the examinations will be focused on each unit’s topics. This type of course allows quite a bit of freedom, for instance, in determining at what time of day and where you do your coursework. It does, however, entail quite a bit of self-discipline and determination in order to keep up with the assignments. There are grade penalties for late work.

**Attendance Policy**

1. Students are expected to review all lectures and laboratory sessions
2. Failure to complete assignments or to take exams at designated times without an acceptable excuse will result in a zero for that assignment or exam.
3. Illness may be discussed with the instructor and prior permission received

Excuses for the following reasons should be discussed prior to submission:
- Illness of the student or serious illness of a member of the student’s immediate family.
- Death of a member of the student’s immediate family.
- Subpoena for court appearance.
- Participation in intercollegiate athletic events (verified by letter from professor, Dean or Athletic Department official)
- Religious holidays
- Other reasons the instructor deems appropriate, e.g. job interview

**Late Submissions:**

As a distance education learner, it is your responsibility to share a significant
responsibility for preparing and discussing course material. If a serious situation arises and you anticipate that you will not be able to meet a deadline, it should be discussed with the instructor, before the due date. If the instructor is contacted, regarding the problem at least several days before the due date, and judges it to warrant special consideration (usually due to illness or injury) the instructor and you will negotiate an alternate due date. If the instructor has not been contacted and special consideration has not been granted, all material turned in after the due date will be penalized 10% of total possible points for each day late on the written assignments and discussion questions. Late exams will be penalized 5 points a day for each day late.

Make-up Examinations:

Make-up exams will only be given with a valid university excuse. This means a Doctor’s statement or other documentation must be provided. You are responsible for informing the instructor prior to missing an examination or no later than one week after the examination’s official date with an official excuse. The student must initiate arrangements to take the make-up immediately after returning to the class. A Make-up must occur within 1 week from the time that the student initiates arrangements for it or the student will receive a zero grade. Exam make-ups (either given before or after the regularly scheduled exam) are essay question exams designed to cover the material.

Learners with Disabilities:

Auburn University is committed to providing accommodations and services to learners with documented disabilities. Any learner with a qualified disability which requires accommodations should contact The Program for Learners with Disabilities, 1244 Haley Center, Auburn University, AL 36849, 334-844-2096 PH, 334-844-2099 FAX, haynemd@auburn.edu. More information is available on their website at www.auburn.edu/disability. The office will fax or mail the required forms to learners to apply for services. Learners who have questions to participate in this course should contact the above office in advance to ensure proper accommodations.

References

The textbook for the course is Soil Resources and Conservation for Productivity and Environmental Protection by Frederick R. Troeh, J. Arthur Hobbs and Roy L. Donahue (2004 Prentice Hall). Additional resources supporting course topics will be provided to each student or be available in the Auburn University Library or in Blackboard. The list of references is made available in the course website on Blackboard.
The Auburn University Oath of Honor

“In Accordance with those virtues of Honesty and Truthfulness set forth in the Auburn Creed, I, as a student and fellow member of the Auburn Family, do hereby pledge that all work is my own, achieved through personal merit and without any unauthorized aid. In the promotion of integrity, and for the betterment of Auburn, I give honor to this, my oath and obligation.”

Plagiarism and Academic Dishonesty:

Plagiarism is the act of presenting directly or indirectly someone else’s work as your own. Plagiarism is a major type of academic dishonesty and will not be tolerated. Similarly cheating on tests in any way, falsifying bibliographies, fraudulent quotes, and similar practices are intolerable forms of academic dishonesty. The University’s policy for academic misconduct in the Learner Code of Conduct will be followed for this course (see the Tiger Cub). If any questions regarding its contents, the learners are expected to contact the instructor.

You are expected to sign a plagiarism creed online in your course on Blackboard.