CENTRAL TEXAS COLLEGE
SYLLABUS FOR AGCR 2318
SOIL SCIENCE

Semester Hours Credit: 3

Instructor:
Office Hours:

I. INTRODUCTION

A. The purpose of this course is to introduce the student to the basic concepts of soils which will encompass the aspects of formation, use, management, and conservation of the world’s soils.

B. The course is an elective course which may be taken to meet curriculum requirements for the Associates in Science Degree, Horticulture Associate of Applied Science, and Agriculture Technology Certificate of Completion.

C. This course is occupationally related and serves as preparation for careers in the fields of the agricultural sciences, farm and ranch management, and perhaps other fields as well.

D. Prerequisite: None

II. LEARNING OUTCOMES

Upon successful completion of this course, Soil Science, the student will:

A. Identify the soil and the basic concepts of the soil.

B. Describe the relationship between the major soil components.

C. Describe the movement of water within the soil.

D. List and describe the methods of soil water retention.

E. Define soil water management and its importance to society.

F. Describe the importance of soil aeration.

G. Identify the importance of soil temperature to crop production.

11/09/10
III. INSTRUCTIONAL MATERIALS

Text:
The instructional materials identified for this course are viewable through www.ctcd.edu/books

I. COURSE REQUIREMENTS

A. Reading Assignments: Reading assignments may be assigned in accordance with and in addition to class work and lab activities. Students will be responsible for all assigned material on exams.

B. Class Projects: Class projects may be assigned in accordance with and in addition to class work and lab activities. Point value of each project will be assigned in accordance with the complexity of the project. Failure to complete each project in the assigned time frame will result in an automatic grade of zero.

C. Class Performance: Class attendance is required and expected. Attendance will be taken at each lecture. Arriving late to class, for any reason, will constitute an absence. Anyone with four (4) absences will automatically be dropped from the class and receive an F for the class (CTC Policy). Work for excused absences must be completed and turned in prior to the absence. Students absent will be responsible for acquiring class notes from other class members. Any work or exam not completed will be assigned a grade of zero.

II. EXAMINATIONS

A. Three or four major exams and a comprehensive final exam will be given. The exams will be mainly objective, to be graded by the instructor and returned to the student.

B. A review will be given prior to each exam.

C. Missed exams will be scored as a zero.

D. Make-up exams will not be given.
III. SEMESTER GRADE COMPUTATION

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Points</th>
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<tbody>
<tr>
<td>Major exams</td>
<td>100 points (each)</td>
</tr>
<tr>
<td>Project</td>
<td>100 points (if assigned)</td>
</tr>
<tr>
<td>Lab work</td>
<td>100 points (approximately)</td>
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<tr>
<td>Final exam</td>
<td>200 points</td>
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</table>

The letter grade for the course is based upon a percentage of total points throughout the semester. Grades will be computed as follows:

- 90% - 100% = A
- 80% - 89% = B
- 70% - 79% = C
- 60% - 69% = D
- 0% - 59% = F

IV. NOTES AND ADDITIONAL INSTRUCTIONS FROM COURSE INSTRUCTOR

A. Course Withdrawal: It is the student's responsibility to officially drop a class if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file an Application for Withdrawal or an Application for Refund. The withdrawal form must be signed by the student. Application for Withdrawal will be accepted at any time prior to Friday of the 12th week of classes during the 16-week fall and spring semesters. The deadline for sessions of other lengths is as follows:

- 11-week session: Friday of the 8th week
- 8-week session: Friday of the 6th week
- 5½-week session: Friday of the 4th week

The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

Students who officially withdraw will be awarded the grade of "W", provided the student's attendance and academic performance are satisfactory at the time of official withdrawal. Students must file a withdrawal application with the college before they may be considered for withdrawal. A student may not withdraw from a class for which the instructor has previously issued the student a grade of "F" or "FN" for nonattendance.
B. **Administrative Withdrawal**: An administrative withdrawal may be initiated when the student fails to meet College attendance requirements. The instructor will assign the appropriate grade on the Administrative Withdrawal Form for submission to the registrar.

C. **Incomplete Grade**: The College catalog states, "An incomplete grade may be given in those cases where the student has completed the majority of the course work but, because of personal illness, death in the immediate family, or military orders, the student is unable to complete the requirements for a course..." Prior approval from the instructor is required before the grade of "I" is recorded. A student who merely fails to show for the final examination will receive a zero for the final and an "F" for the course.

D. **Cellular Phones**: Cellular phones will be turned off while the student is in the classroom or laboratory. Any cellular phone that goes off during class will become the property of the instructor.

E. **American's with Disabilities Act (ADA)**: Disability Support Services provide services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Explore the website at [www.ctcd.edu/disability-support](http://www.ctcd.edu/disability-support) for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

F. **Instructor Discretion**: The instructor reserves the right of final decision in course requirements.

G. **Civility**: Individuals are expected to be cognizant of what a constructive educational experience is and respectful of those participating in a learning environment. Failure to do so can result in disciplinary action up to and including expulsion.

H. **Office Hours**: Students are encouraged to take advantage of the instructor’s office hours. No appointment is necessary for such visits.

I. **Unethical Behavior**: Cheating in any form will not be tolerated.

J. **Arriving Late**: Students are expected to arrive to lecture, labs, and exams on time. Students arriving late not only interrupt the instructor but also the class. Students arriving late to exams will not be given additional time to complete the exam.
K. **Disruptive Behavior:** Any type of student behavior that interferes with the rights of fellow students will not be tolerated, and students engaging in such behavior will be asked to leave the classroom.

L. **Common Courtesy:** Students are expected to remove their hats when class meets inside.

M. **Food and Drink:**

V. **COURSE OUTLINE**

A. **Lesson One:** The soils around us.

   1. **Learning Outcomes:** Upon successful completion of this lesson, the student will:

   a. Identify the soil and the concepts of the soil.
   b. Describe the key roles of the soil.
   c. Describe soil formation.
   d. Define a soil profile.
   e. Differentiate between topsoil and subsoil.

   2. **Learning Activities:**

   a. Classroom lecture and discussion
   b. Student homework study
   c. Lab assignments
   d. Reading assignments

   3. **Lesson Outline:**

   a. Key roles of soil
   b. Soil formation
   c. Topsoil and subsoil

B. **Lesson Two:** Interface of air, water, minerals, and life

   1. **Learning Outcomes:** Upon successful completion of this lesson, the student will:

   a. Describe the major components of the soil.
   b. Describe the relationship between the major soil components.
2. **Learning Activities:**
   
a. Classroom lecture and discussion  
b. Student homework study  
c. Lab assignments  
d. Reading assignments

3. **Lesson Outline:**
   
a. Minerals  
b. Organic matter  
c. Soil water  
d. Pores  
e. Air

C. **Lesson Three: Soil water movement**

1. Learning Outcomes: Upon successful completion of this lesson, the student will:
   
a. Describe the movement of water within the soil.  
b. Describe and list the methods of soil water retention.  
c. List factors that move water within soil.  
d. Describe rate of water movement.  
e. List soil water saturation levels.

2. Learning Activities:
   
a. Classroom lecture and discussion  
b. Student homework study  
c. Lab assignments  
d. Reading assignments

3. Lesson Outline:
   
a. Soil water retention  
b. Modes of water movement  
c. Forces that move water  
d. Factors that affect water potential  
e. Water movement rate  
f. Soil-air water conductivity  
g. Soil water saturation levels
D. Lesson Four: Soil water management

1. Learning Outcomes: Upon successful completion of this lesson, the student will:

a. Define soil water management.
b. Differentiate between irrigated and non-irrigated land.
c. Describe irrigated and non-irrigated land.
d. List methods of irrigation.
e. Discuss future concerns of irrigation.

2. Learning Activities:

a. Classroom lecture and discussion
b. Student homework study
c. Lab assignments
d. Reading assignments

3. Lesson Outline:

a. Non-irrigated land
b. Irrigated land
c. Infiltration
d. Irrigation methods
e. Flood irrigation
f. Furrow irrigation
g. Sprinkler irrigation
h. Drip irrigation
i. Irrigation loss
j. Future concerns of irrigation

E. Lesson Five: Soil aeration, wetlands, and soil temperature

1. Learning Outcomes: Upon successful completion of this lesson, the student will:

a. Define the importance of soil aeration.
b. List and describe the factors affecting soil aeration.
c. Describe the importance of soil aeration management.
d. Identify wetland characterizations.
e. Describe the value of wetlands.
f. Describe the importance of soil temperature to crop production.
g. Describe the affects of soil erosion.
2. Learning Activities:
   a. Classroom lecture and discussion
   b. Student homework study
   c. Lab assignments
   d. Reading assignments

3. Lesson Outline:
   a. Aeration
   b. Gaseous composition of soil air
   c. Factors affecting soil aeration
   d. Soil aeration management
   e. Wetland characterizations
   f. Wetland value
   g. Soil temperature
   h. Microbial processes
   i. Freezing and thawing
   j. Fire
   k. Solar radiation
   l. Thermal properties of soil
   m. Soil temperature control
   n. Land degradation
   o. Soil - vegetation relation
   p. Geological erosion
   q. Accelerated erosion
   r. On-site erosion
   s. Off-site erosion
   t. Mechanics of water erosion
SYLLABUS FOR AGCR 2318
SOIL SCIENCE
SCANS COMPETENCIES

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<tr>
<th>Course Objectives</th>
<th>Resources</th>
<th>Information</th>
<th>Interpersonal Skills</th>
<th>Systems</th>
<th>Technology</th>
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### Course Objectives

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<tr>
<th>Course Objectives</th>
<th>Basic Skills</th>
<th>Thinking Skills</th>
<th>Personal Qualities</th>
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The know-how identified by SCANS is made up of five competencies and a three-part foundation of skills and personal qualities needed for solid job performance.

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<tr>
<th>COMPETENCY</th>
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<tr>
<td>Resources: Identifies, organizes, plans, and allocates resources.</td>
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<td>C1 Time: Selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules.</td>
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<td>C2 Money: Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives.</td>
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<td>C3 Materials and Facilities: Acquires, stores, allocates, and uses materials or space efficiently.</td>
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<td>C4 Human Resources: Assesses skills and distributes work accordingly, evaluates performance, and provides feedback.</td>
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| Information: Acquires and uses information. |
| C5 Acquires and evaluates information. |
| C6 Organizes and maintains information. |
| C7 Interprets and communicates information. |
| C8 Uses computers to process information. |

| Interpersonal: Works with others. |
| C9 Participates as a member of a team: Contributes to group effort. |
| C10 Teaches other new skills. |
| C11 Serves Clients/Customers: Works to satisfy customer’s expectations. |
| C12 Exercises Leadership: Communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies. |
| C13 Negotiates: Works toward agreements involving exchange of resources; resolves divergent interests. |
| C14 Works with Diversity: Works well with men and women from diverse backgrounds. |

| Systems: Understands complex interrelationships. |
| C15 Understands Systems: Knows how social, organizational, and technological systems work and operates effectively with them. |
| C16 Monitors and Corrects Performance: Distinguishes trends, predicts impacts on system operations, diagnoses system’s performance, and corrects malfunctions. |
| C17 Improves or Designs Systems: Suggests modifications to existing systems and develops new or alternative systems to improve performance. |

| Technology: Works with a variety of technologies. |
| C18 Selects Technology: Chooses procedures, tools, or equipment, including computers and related technologies. |
| C19 Applies Technology to Task: Understands overall intent and proper procedures for setup and operation of equipment. |
| C20 Maintains and Troubleshoots Equipment: Prevents, identifies, or solves problems with equipment, including computers and other technologies. |
| F1 | Reading: Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules. |
| F2 | Writing: Communicates thoughts, ideas, information, and messages in writing; creates documents such as letters, directions, manuals, reports, graphs, and flowcharts. |
| F3 | Arithmetic: Performs basic computations; uses basic numerical concepts such as whole numbers, etc. |
| F4 | Mathematics: Approaches practical problems by choosing appropriately from a variety of mathematical techniques. |
| F5 | Listening: Receives, attends to, interprets, and responds to verbal messages and other cues. |
| F6 | Speaking: Organizes ideas and communicates orally. |

**Thinking Skills:** Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons.

| F7 | Creative Thinking: Generates new ideas. |
| F8 | Decision Making: Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative. |
| F9 | Problem Solving: Recognizes problems and devises and implements plan of action. |
| F10 | Seeing Things in the Mind’s Eye: Organizes and processes symbols, pictures, graphs, objects, and other information. |
| F11 | Knowing How to Learn: Uses efficient learning techniques to acquire and apply new knowledge and skills. |
| F12 | Reasoning: Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem. |

**Personal Qualities:** Displays responsibility, self-esteem, sociability, self-management, integrity, and honesty.

| F13 | Responsibility: Exerts a high level of effort and perseveres towards goal attainment. |
| F14 | Self-Esteem: Believes in own self-worth and maintains a positive view of self. |
| F15 | Sociability: Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings. |
| F16 | Self-Management: Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control. |
| F17 | Integrity/Honesty: Chooses ethical courses of action. |