Lecture Instructor
Dr. Aakriti Sharma, Ph.D.
Office: Agriculture, room 122A
Email: Aakriti.Sharma@sfasu.edu
Office Hours: TTh 1:00 – 2:00 pm, or by appointment.

AGRI 5344- Soil-Plant Relationships
Credit hours: 3
Level: Graduate

Course Description
This course will provide an understanding of how soil conditions affect plant growth. The students will be introduced to the concepts of cation exchange, soil-plant interaction and their mutual relationships, factors affecting availability of nutrients, the characteristics of soil and how it influences plant growth, soil reaction, nitrogen fixation, soil analysis and fertilizer materials.

Course prerequisites: 12 hours of Agriculture or related field

Class Time and Place: Tuesday and Thursday 11:00 am – 12:15 pm; Agriculture Rm 108

Textbook: Soil Fertility and Fertilizers – 8th edition by Authors: Havlin, Tisdale, Nelson, and Beaton
Publisher: Pearson Education

Useful References:
- Plant Analysis Handbook II: A Practical Sampling, Preparation, Analysis, and Interpretation
Program Learning Outcomes (PLOs):

1. The student will communicate an understanding of scientific discovery and the diffusion of information as it applies to the industry of agriculture.
2. The student will demonstrate competence in the major technical subject matter areas of their graduate program.
3. The student will exhibit problem solving skills based on quantitative and analytical reasoning.
4. The student will demonstrate effective communication skills. Students will demonstrate competence in both written and oral communications.
5. The student will exhibit leadership and other interpersonal skills needed for career placement and advancement.

Expected Student Learning Outcomes: Upon successful completion of this course students will be able to:

1. Describe the influence of chemical, biological, and physical properties of soil on nutrient availability to plants.
2. Identify soil fertility and plant nutrition problems and recommend proper corrective action.
3. Identify soil and nutrient management practices that maximize plant productivity and profitability while maintaining or enhancing environmental quality.

Major Learning Objectives:
- Describe how aluminum toxicity contributes to soil acidity and plant growth.
- Explain the concept of cation exchange capacity and how it affects nutrient availability in plants.
- Calculate ECEC, %Al Saturation, CaCO3 equivalent and make lime recommendations.
- Identify different types of liming materials.
- Define nitrification, denitrification, mineralization, and immobilization.
- Describe how soil-plant interacts in the context of symbiotic N fixation.
- Explain how soil properties (e.g., soil texture) affect P bioavailability in soil.
- Describe the traditional and novel pathways for K fixation in soil.
- Interpret the Soil Test Report
- Develop professional skills (e.g., presentation skills) and learn how to review and summarize research papers (e.g., literature review)
Assessment and Grading*

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Quantity</th>
<th>Points Each</th>
<th>Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework/take-home assignments</td>
<td>~4</td>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>Group Presentation</td>
<td>1</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Exams (including Midterm, Final)**</td>
<td>3</td>
<td>100</td>
<td>300**</td>
</tr>
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*The quantity of specific assignments, and thus the total number of points available in this course, are approximate and subject to minor changes.

Grading Scale

<table>
<thead>
<tr>
<th>Percentage of Total Points Earned¹</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>90-100%</td>
<td>A</td>
</tr>
<tr>
<td>80-89%</td>
<td>B</td>
</tr>
<tr>
<td>70-79%</td>
<td>C</td>
</tr>
<tr>
<td>60-69%</td>
<td>D</td>
</tr>
<tr>
<td>&lt;60%</td>
<td>F</td>
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</table>

¹. Individual assignment grades are based on a points system (e.g., 8/10 points instead of 80%). Your grade at the end of the semester will be calculated based on how many points you accumulated out of the total possible points available in the course (e.g., 900 points earned ÷ 1070 total points = 84% = B)

*Any questions or concerns about student grades must be addressed in a face-to-face meeting, either during office hours or by appointment. I will not typically answer questions about grades via email or phone.

Exams: Exams in this class (administered face-to-face) are designed to test your knowledge, critical thinking, and communication skills. Questions for the midterm exams will focus heavily on material preceding each exam. The final exam will be comprehensive and focus on all of the material covered throughout the semester.

Group Presentation: Students will be randomly selected to form a group of two. Each member in the group will collaborate and contribute to the presentation equally. For presentation, choose a research paper of your interest that is relevant to soil-plant relationships (e.g., soil nutrient availability, plant nutrition, soil fertility, nutrient management etc.) and synthesize the paper and present it as “Oral Presentation”. Limit your presentation to 20 minutes.

Right before the Spring Break you will need to give me the topic of your presentation. The presentation will be evaluated and graded!
SFA AG DEPARTMENT ATTENDANCE AND PUNCTUALITY POLICY (referencing university policy, 6.7)

Attendance and punctuality are core skills to have as an engaged student and for a successful career. Excuses can either be provided as hard copy or electronically. Documentation for excused absences is due within 10 business days of the absence.

For reference, below are examples of excused absences.
- Death of family member
- Hospitalization — admitted into the hospital for health purposes (medical or mental)
- Personal emergency — this can include car accidents or drastic life events, such as a fire
- Administrative and other — this can include jury duty, court subpoena, etc.

If you miss class for any other reason and feel your absence should be excused, you must provide an email explaining why the absence should be excused and provide appropriate documentation. This email must be provided within 10 business days of the absence. All other absences are considered unexcused.

Absences and Missed Assignments
- You are responsible for regularly checking the D2L for any announcement and assignments.
- You may have special circumstances during a test, assignment, etc. All special requests must be made via email as a record of the request. This allows me to reply with confirmation of any changes to a test or exam.
- There will be no make-up assignments for missed tests unless you notify me before the test and explain why you can’t be there and you provide proper documentation for your absence (doctor’s note, etc.). I realize unexpected events occur, and again, proper documentation for your absence (doctor’s note, etc.) is required.
- It is your responsibility to make arrangements to take a make-up exam. Failure to follow this procedure will result in a 0 (zero) grade for any missed hour exam.

Electronics
Computers, tablets, phones, electronic devices, communication through watches, etc. will not be allowed to be used in class as it is very distracting to other students. Hand-writing notes is recommended as students tend to learn better as they are forced to synthesize and process information.
Some students have special learning needs and may need to use computers and tablets. In that case, send me an email request.

Calculator: Basic, non-programmable, non-graphing scientific calculator for exams. NO phones allowed.
UNIVERSITY POLICIES

Academic Integrity (4.1)

The Code of Student Conduct and Academic Integrity outlines the prohibited conduct by any student enrolled in a course at SFA. It is the responsibility of all members of all faculty, staff, and students to adhere to and uphold this policy.

Articles IV, VI, and VII of the new Code of Student Conduct and Academic Integrity outline the violations and procedures concerning academic conduct, including cheating, plagiarism, collusion, and misrepresentation. Cheating includes, but is not limited to: (1) Copying from the test paper (or other assignment) of another student, (2) Possession and/or use during a test of materials that are not authorized by the person giving the test, (3) Using, obtaining, or attempting to obtain by any means the whole or any part of a non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters without permission of the Faculty member, (4) Substituting for another person, or permitting another person to substitute for one’s self, to take a test, (5) Falsifying research data, laboratory reports, and/or other records or academic work offered for credit, (6) Using any sort of unauthorized resources or technology in completion of educational activities.

Plagiarism is the appropriation of material that is attributable in whole or in part to another source or the use of one’s own previous work in another context without citing that it was used previously, without any indication of the original source, including words, ideas, illustrations, structure, computer code, and other expression or media, and presenting that material as one’s own academic work being offered for credit or in conjunction with a program course or degree requirements.

Collusion is the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on academic dishonesty, including disclosing and/or distributing the contents of an exam.

Misrepresentation is providing false grades or résumés; providing false or misleading information in an effort to receive a postponement or an extension on a test, quiz, or other assignment for the purpose of obtaining an academic or financial benefit for oneself or another individual or to injure another student academically or financially.

Withheld Grades Semester Grades Policy (5.5)

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. Please read the complete policy at http://www.sfasu.edu/policies/5.5_course-grades.pdf
Students with Disabilities (6.1)
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/

Responsible Use of Technology
It is expected that all students will only use cell phones, PDAs, laptop computers, MP3 players and other technology outside of class time or when appropriate in class. Answering a cell phone, texting, listening to music or using a laptop computer for matters unrelated to the course may be grounds for dismissal from class or other penalties.

Acceptable Student Behavior
Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy 10.4). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed. Please read the complete policy at http://www.sfasu.edu/policies/student-code-of-conduct_10.4.pdf

Tentative Lecture Schedule*

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<thead>
<tr>
<th>Week*</th>
<th>Topic(s)</th>
<th>Book Chapter</th>
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<tbody>
<tr>
<td>Week 1 (Jan. 18)</td>
<td>Syllabus, Introduction</td>
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<tr>
<td>Week 2 (Jan 23-25)</td>
<td>Basic Soil-Plant Relations</td>
<td>Ch. 2</td>
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<tr>
<td>Week 2 (Jan 23)</td>
<td>Research paper review assignment</td>
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<tr>
<td>Week 3 (Jan 30)</td>
<td>Research paper discussion</td>
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<tr>
<td>Week 3 (Feb 1)</td>
<td>Chemical units Review</td>
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<tr>
<td>Week 4 (Feb 6-Feb 13)</td>
<td>Soil Acidity and Liming</td>
<td>Ch. 3</td>
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<tr>
<td>Feb 15</td>
<td>Exam 1</td>
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<tr>
<td>Week 5-8 (Feb 20-Mar 7)</td>
<td>Nitrogen</td>
<td>Ch. 4</td>
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<tr>
<td>Feb 22</td>
<td>Guest Lecture on Nitrogen</td>
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<tr>
<td>Week 9 (March 11-15)</td>
<td>Spring break</td>
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<tr>
<td>Week 10-11 (Mar 19-26)</td>
<td>Phosphorus</td>
<td>Ch. 5</td>
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<td><strong>March 26</strong></td>
<td><strong>Guest Lecture on Phosphorus</strong></td>
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<tr>
<td>Week 12 (Mar 28-Apr 2)</td>
<td>Potassium</td>
<td>Ch. 6</td>
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<tr>
<td>Week 13 (Apr 4-9)</td>
<td>Soil Testing and Plant Analysis</td>
<td>Ch. 9</td>
</tr>
<tr>
<td><strong>April 11</strong></td>
<td><strong>Exam 2</strong></td>
<td></td>
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<tr>
<td>April 16-30</td>
<td>Group Presentation and Discussions</td>
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<tr>
<td>May 2</td>
<td>Recap and Review</td>
<td></td>
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<tr>
<td><strong>May 07 (Tuesday)</strong></td>
<td><strong>Exam 3 - Final Exam</strong>, 10:30 a.m. to 12:30 p.m.</td>
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*The dates and topics for individual lectures are subject to change. Any alterations to this schedule will be announced in advance during class sessions.

** To prevent personal or academic conflicts for the final exam, or to look up exam times for other classes, see the official SFA final exam schedule:

https://www.sfasu.edu/registrar/registration-information/final-exam-schedule