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### Basic Course Information

Semester:	Fall 2020	Instructor Name:	Dr. Michael Kanyi
Course No. & Title	AG 120: Soil Science	Email:	michael.kanyi@imperial.edu
CRN #:	11203	Webpage (optional):	
Classroom:	Online	Office #:	3114
Semester Dates:	August 17, 2020 – Dec 11, 2020	Office hours (email, text canvas, pronto)	MTWR 1:00 p.m. -2:00 p.m.
Class Days:	Online	Office Phone #:	760-355-5717
Class Times:	Online	Emergency Contact:	Tisha Nelson, Economic & Workforce Development (760) 355-6361/ (760) 355-6161
Units:	3		

### Course Description

This course provides a basic knowledge of the physical, chemical, and biological properties of soils and their characteristics. Includes fundamental soil properties, soil-plant relationships, soil formation, fertilization and soil management, salinity, pH, erosion management, soil moisture and non-agricultural uses. Laboratory required. Laboratory topics include soil type, classification, soil reaction, soil fertility and physical properties of soil. (CSU, UC, UofA)

### Course Prerequisite(s) and/or Corequisite(s)

Basic Inorganic Chemistry

### Student Learning Outcomes

Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to:

1. Identify soil crop compatibility via research and reporting information obtained from lecture, journal study and text materials in either a written or verbal manner by assigned completion date (ILO1, ILO2, ILO3, ILO4).
2. Conduct lab analysis using prescribed protocols on known samples to derive accurate & repeatable results that are reported in a useful format (ILO1, ILO2, ILO3, ILO4).
3. Develop an accurate and useful recommendation for soil application or amendment for desired crop production within a reasonable soil/crop interaction (ILO1, ILO2, ILO4).

### Course Objectives

Upon satisfactory completion of the course, students will be able to:

1. Analyze local soil quality as affected by human and natural activities and explain local geographical features and their relationship to local soils.
2. Describe and identify the textural class of a soil by feel and laboratory procedures.
3. Evaluate parent rocks and other soil forming processes influence on local and global soils.
4. Describe the physical, chemical, and biological properties of soils and understand their formation and why soils are reservoirs for nutrients, water, and microscopic life. To effectively manage these properties for sustained productivity.

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5. Understand the methods and means by which organic matter may be added to the soil and how it decomposes to maintain and stimulate soil health.
6. Describe the chemical elements necessary for plant growth, identify common deficiency and toxicity symptoms, and keep the soil in an adequate supply and balance.
7. Measure and understand the effects and alleviation of soil compaction in crop production situations.
8. Demonstrate how to determine a Soil Storie Index Rating and a Natural Resources Conservation Service land capability class.
9. Understand the effects of salts on soil structure, pH, productivity, and drainage.
10. Describe use, importance, and function of soil maps utilizing township range and GIS at the local, state, and global levels.

### Textbooks & Other Resources or Links

#### Reference Textbooks

- Brady, N. C. & Weil, R. (2019). Elements of the Nature and Properties of Soils (4th ed.): Pearson ISBN: ISBN-13:9780133254648

#### Other references

- Brady, N. C. & Weil, R. (2017). Nature and Properties of Soils (15th ed.): Pearson
- Plaster, E., J. (2014). Soil Science and Management 6<sup>th</sup> ed. Cengage Learning ISBN: 978-0840024329 ISBN-13: 978-0133254488; ISBN-10: 9780133254488

### Course Requirements and Instructional Methods

Learning activities for this class will include, but not limited to, instructor's guided discussions in canvas, lecture notes posted in canvas, instructional YouTube videos, simulated laboratory activities, outside/field practical experience, assignments, quizzes and tests. **Participation in all course activities is highly encouraged as all these will impact the final grade.** Critical thinking approach to solving agricultural economic issues at the regional, state, national and global level will be emphasized.

**Out of Class Assignments:** The Department of Education policy states that one (1) credit hour is the amount of student work that reasonably approximates not less than one hour of class time and two (2) hours of out-of-class time per week over the span of a semester. WASC has adopted a similar requirement.

#### What if I need to borrow technology or access to WIFI?

1. To request a loaner laptop, MYFI device, or other electronic device, please submit your request here: <https://imperial.edu/students/student-equity-and-achievement/>
2. If you'd like access the WIFI at the IVC campus, you can park in parking lots "I & J". Students must log into the IVC student WIFI by using their IVC email and password. The parking lots will be open Monday through Friday from 8:00 a.m. to 7:00 p.m.

#### Guidelines for using parking WIFI:

- Park in every other space (empty space BETWEEN vehicles)
- Must have facemask available
- For best reception park near buildings
- Only park at marked student spaces

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- Only owners of a valid disabled placard may use disabled parking spaces
- Only members of the same household in each vehicle
- Occupants **MUST** remain in vehicles
- Restrooms and other on-campus services not available
- College campus safety will monitor the parking lot
- Student code of conduct and all other parking guidelines are in effect
- Please do not leave any trash behind

**-No parking permit required**

If you have any questions about using parking WIFI, please call Student Affairs at 760- 355-6455.

This is an online course and the mode of instruction is asynchronous. You're therefore advised to dedicate ample time for the daily instructional activities and assignments.

**Course Grading Based on Course Objectives**

Students are advised to acquaint themselves with all rules and regulations of Standards of Student Conduct outlined in the Imperial Valley College General Catalog. For writing assignments, it is expected that each student will demonstrate proficiency in the use of the English Language. Grammatical errors and writing that do not express ideas clearly will affect your grade.

***Tests***

There will be a **mid-term test** and a **final comprehensive test**. The date for mid-term test will be announced. The final test will be a comprehensive and will cover all the modules. Test questions may include true/false, multiple choice, matching, and short answer questions. All students are advised to strictly adhere to the dates and times for the tests which will be communicated. **There will be no make-up tests.**

***Distribution of grading points towards the final grade will be as follows***

- Discussion 15%
- Lab/assignments/test 25%
- Quizzes 20%
- Fina test 40%

***Grading Legend***

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

**Attendance**

- A student who fails to attend the first meeting of this class will be dropped by the instructor as of the first official meeting. Should readmission be desired, the student's status will be the same as that of any other

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student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See [General Catalog](#) for details.

- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absence exceed the number of hours the class is scheduled to meet per week may be dropped. **For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.**
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.

### **What does it mean to “attend” an online class?**

Attendance is critical to student success and for IVC to use federal aid funds. Acceptable indications of attendance are:

- Student submission of an academic assignment
- Student submission of an exam
- Student participation in an instructor-led Zoom conference
- Documented student interaction with class postings, such as an interactive tutorial or computer-assisted instruction via modules
- A posting by the student showing the student's participation in an assignment created by the instructor
- A posting by the student in a discussion forum showing the student's participation in an online discussion about academic matters
- An email from the student or other documentation showing that the student has initiated contact with a faculty member to ask a question about an academic subject studied in the course.

**Logging onto Canvas alone is NOT adequate to demonstrate academic attendance by the student.**

### **Classroom Etiquette**

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor.
- Food and Drink are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed by the instructor.
- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the [General Catalog](#).
- Children in the classroom: Due to college rules and state laws, no one who is not enrolled in the class may attend; children are not allowed.

### **How do I act differently if I have an on-ground class during COVID?**

- 1. DO NOT COME TO CAMPUS OR ATTEND AN OFF-CAMPUS CLASS IF YOU FEEL SICK, HAVE A FEVER, OR HAVE A COUGH**
  - a. Even if your symptoms are mild, stay home.
  - b. Email your instructor to explain why you are missing class.
  - c. [If you are sick with COVID-19 or think you might have COVID-19](#), provides CDC guidance.
  - d. If you have tested positive for COVID-19, you must self-quarantine for 14 days and then be without symptoms for at least 72 hours. Clearance is required prior to returning to any face-to-face interaction. It is recommended that you undergo a final COVID-19 test to confirm that you are no longer infected.

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- e. If you are exposed through direct contact with a person known to be COVID-19 positive, then you must submit negative COVID-19 test results prior to returning to any face-to-face interaction.
- 2. ARRIVE AT CAMPUS EARLY (at least 15 minutes early is advised).**
  - a. All people entering the IVC campus will need to pass a screening process, which will occur at the gates as your drive onto campus. You will need to take a short questionnaire and get your temperature taken (the screening is completely touchless and will take place while you remain in your car).
- 3. BRING A MASK TO CLASS (and always wear it).**
  - a. Be sure that your mask covers both your nose and mouth. If your mask is cloth, then wash it each day. If your mask is disposable, then use a new one each day.
- 4. GO DIRECTLY TO YOUR CLASSROOM.**
  - a. The IVC campus is mostly closed so you should not visit other areas or seek any face-to-face services. Services are available to students online and can be accessed through [www.imperial.edu](http://www.imperial.edu).
- 5. WASH YOUR HANDS FREQUENTLY (and use the provided sanitation supplies).**
  - a. Your classroom is equipped with cleaning supplies. Use them as needed.
- 6. BE SURE TO SOCIAL DISTANCE (stay at least 6 feet from other).**
  - a. The number of students in a classroom at any one time is very limited so you have plenty of space to spread and ensure that you stay at least 6 feet from others.
- 7. BRING YOUR OWN FOOD AND DRINKS**
  - a. There is no food service currently offered on campus.

### Online Netiquette

- What is netiquette? Netiquette is internet manners, online etiquette, and digital etiquette all rolled into one word. Basically, netiquette is a set of rules for behaving properly online.
- Students are to comply with the following rules of netiquette: (1) identify yourself, (2) include a subject line, (3) avoid sarcasm, (4) respect others' opinions and privacy, (5) acknowledge and return messages promptly, (6) copy with caution, (7) do not spam or junk mail, (8) be concise, (9) use appropriate language, (10) use appropriate emoticons (emotional icons) to help convey meaning, and (11) use appropriate intensifiers to help convey meaning [do not use ALL CAPS or multiple exclamation marks (!!!)].

### How am I expected to act in an online “classroom” (especially Zoom)?

Attending a virtual meeting can be a challenge when there are many students on one conference call.

Participating in such meetings may count as class attendance, but disruptive behavior may also result in you not being admitted to future meetings. Follow the tips below for best results:

#### 1) Be RESPECTFUL

- a. Your written, verbal, and non-verbal communications should be respectful and focused on the learning topics of the class.

#### 2) Find a QUIET LOCATION & SILENCE YOUR PHONE (if zooming)

- a. People walking around and pets barking can be a distraction.

#### 3) EAT AT A DIFFERENT TIME.

- a. Crunching food or chugging drinks is distracting for others.
- b. Synchronous zoom times are set in advance so reserve meals for outside class meetings.

#### 4) ADJUST YOUR LIGHTING SO THAT OTHERS CAN SEE YOU

- a. It is hard to see you in dim lighting so find a location with light.

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- b. If your back is to a bright window, you will be what is called “backlit” and not only is it hard on the eyes (glare) but you look like a silhouette.
- 5) POSITION THE CAMERA SO THAT YOUR FACE AND EYES ARE SHOWING**
  - a. If you are using the camera, show your face; it helps others see your non-verbal cues.
  - b. You may be at home, but meeting in pajamas or shirtless is not appropriate so dress suitably. Comb your hair, clean your teeth, fix your clothes, etc. before your meeting time to show self-respect and respect for others.
- 6) Be READY TO LEARN AND PAY ATTENTION**
  - a. Catch up on other emails or other work later.
  - b. If you are Zooming, silence your phone and put it away.
  - c. If you are in a room with a TV – turn it off.
- 7) USE YOUR MUTE BUTTON WHEN IN LOUD PLACES OR FOR DISTRACTIONS**
  - a. Pets barking, children crying, sneezing, coughing, etc. can happen unexpectedly. It’s best if you conference in a private space, but if you can’t find a quiet place, when noises arise **MUTE** your laptop.
- 8) REMEMBER TO UNMUTE WHEN SPEAKING**
  - a. Follow your instructor’s directions about using the “**raise hand**” icon or chat function to be recognized and to speak, but make sure you have unmuted your device.
  - b. Do not speak when someone else is speaking.
- 9) REMAIN FOCUSED AND PARTICIPATE IN THE MEETING**
  - a. Especially when the camera is on YOU, we can all see your actions. Engage in the meeting. Look at the camera. Listen to instruction. Answer questions when asked.
  - b. Do not use the Zoom meeting to meet with your peers or put on a “show” for them.
- 10) PAUSE YOUR VIDEO IF MOVING OR DOING SOMETHING DISTRACTING**
  - a. Emergencies happen. If you need to leave the room or get up and move about, stop your video.

### **Academic Honesty**

Academic honesty in the advancement of knowledge requires that all students and instructors respect the integrity of one another’s work and recognize the important of acknowledging and safeguarding intellectual property.

There are many different forms of academic dishonesty. The following kinds of honesty violations and their definitions are not meant to be exhaustive. Rather, they are intended to serve as examples of unacceptable academic conduct.

- Plagiarism is taking and presenting as one’s own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to “cite a source” correctly, you must ask for help.
- Cheating is defined as fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or plagiarizing will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the General Catalog for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to, the following: (a) plagiarism; (b) copying or attempting to copy from others during an



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examination or on an assignment; (c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment; (e) using a commercial term paper service.

### **How do I show academic honesty and integrity in an online “classroom”?**

- **KEEP YOUR PASSWORDS CONFIDENTIAL.**
  - You have a unique password to access online software like Canvas. Never allow someone else to log-in to your account.
- **COMPLETE YOUR OWN COURSEWORK.**
  - When you register for an online class and log-in to Canvas, you do so with the understanding that you will produce your own work, take your own exams, and will do so without the assistance of others (unless directed by the instructor).

### **Examples of Academic Dishonesty that can occur in an online environment:**

- Copying from others on a quiz, test, examination, or assignment;
- Allowing someone else to copy your answers on a quiz, test, exam, or assignment;
- Having someone else take an exam or quiz for you;
- Conferring with others during a test or quiz (if the instructor didn’t explicitly say it was a group project, then he/she expects you to do the work without conferring with others);
- Buying or using a term paper or research paper from an internet source or other company or taking any work of another, even with permission, and presenting the work as your own;
- Excessive revising or editing by others that substantially alters your final work;
- Sharing information that allows other students an advantage on an exam (such as telling a peer what to expect on a make-up exam or prepping a student for a test in another section of the same class);

Taking and using the words, work, or ideas of others and presenting any of these as your own work is plagiarism. This applies to all work generated by another, whether it be oral, written, or artistic work. Plagiarism may either be deliberate or unintentional.

### **Additional Services for Students**

Imperial Valley College offers various services in support of student success. The following are some of the services available for students. Please speak to your instructor about additional services which may be available.

#### **How do I access services now that we are mostly online?**

- **CANVAS LMS.** Canvas is Imperial Valley College’s Learning Management System. To log onto Canvas, use this link: [Canvas Student Login](#). The [Canvas Student Guides Site](#) provides a variety of support available to students 24 hours per day. Additionally, a 24/7 Canvas Support Hotline is available for students to use: 877-893-9853.
- **Learning Services.** In order to accommodate students and maximize student success during the COVID-19 Pandemic, all tutoring support is being provided through one Zoom link ([IVC online Tutoring](#)). When campus is open again, there are several learning labs to assist students. Whether you need support using

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computers, or you need a tutor, please consult your [Campus Map](#) for the [Math Lab](#); [Reading, Writing & Language Labs](#); and the [Study Skills Center](#).

- [Library Services](#). Visit the Spencer Library's page on the IVC website for a wealth of valuable resources and online access to databases, e-books and more. Contact us so we can help you with instructional and research development skills (for those conducting research and writing academic papers). When campus re-opens, students also have access to tutoring services in the Study Skills Center as well as private study rooms for small study groups. There is more to our library than just books!
- [Career Services Center](#). The Career Services Center is dedicated to serve all IVC students and Alumni. Services include Career Assessments, Resume and Cover Letter Assistance, Interview Preparation, Internship Opportunities and Job Placement.

[Child Development Center](#). The Preschool and Infant/Toddler Centers are on-campus demonstration lab programs that meet the educational, research, and service needs of the institution and community at large. The Preschool program (children three to five years of age) and the Infant/Toddler program (newborn to three years of age) is in buildings 2200 and 2300. Service is available to families who meet the California Department of Education qualifications for enrollment. The centers are open during COVID from Monday-Friday 7:15-5:30. Breakfast, lunch and snack are provided through the California Adult and Child Food Program. Location: Buildings 2200 and 2300. Phone: (760) 355-6528 or (760) 355-6232. Application: <https://forms.imperial.edu/view.php?id=150958>

### **Disabled Student Programs and Services (DSPS)**

Any student with a documented disability who may need educational accommodations should notify the instructor or the [Disabled Student Programs and Services \(DSP&S\)](#) office as soon as possible. When campus is open, the DSP&S office is in Building 2100, telephone 760-355-6313. Please contact them if you feel you need to be evaluated for educational accommodations.

### **Student Counseling and Health Services**

Students have counseling and health services available, provided by the pre-paid Student Health Fee.

- [Student Health Center](#). A Student Health Nurse is available on campus, but you must make an appointment. In addition, Pioneers Memorial Healthcare District provides basic health services for students, such as first aid and care for minor illnesses. Contact the IVC [Student Health Center](#) at 760-355-6128, or when campus reopens, visit Room 1536 for more information.
- [Mental Health Counseling Services](#). Short-term individual, couples, family and group counseling services are available for currently enrolled students. Services are provided in a confidential, supportive, and culturally sensitive environment. Please contact the IVC Mental Health Counseling Services at 760-355-6310 for appointments, or when campus reopens visit Room 1536, for more information.

### **Veteran's Center**

The mission of the [IVC Military and Veteran Success Center](#) is to provide a holistic approach to serving military/veteran students in three key areas: 1) Academics, 2) Health and Wellness, and 3) Camaraderie. The Center also serves as a central hub that connects military/veteran students, as well as their families, to campus and community resources. The goal is to ensure a seamless transition from military to civilian life. When campus reopens, the Center is in Building 600 (Office 624), telephone 760-355-6141.



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### **Extended Opportunity Program and Services (EOPS)**

The Extended Opportunity Program and Services (EOPS) offers services such as priority registration, book grants, transportation assistance, individualized counseling, tutoring, and community referrals to eligible students. Our staff is available to assist and support students in navigating personal, psychological, academic, and/or career-related issues through empathy, cultural-competence, and a commitment to equity and social justice. Also, under the umbrella of EOPS is the CARE (Cooperative Agency Resources for Education) Program, designed to serve single parents and assist with addressing issues that are particular to this population. Students that are single parents receiving TANF/Cash Aid assistance may qualify for our CARE program. For additional information about the EOPS or CARE Programs please contact our Program Office 760.335-6407 and/or visit our Program website [www.imperial.edu/students/eops](http://www.imperial.edu/students/eops) for eligibility criteria and application procedures. We look forward to serving you! - EOPS/CARE Staff

### **Student Equity Program**

The Student Equity & Achievement Program strives to improve Imperial Valley College's success outcomes, particularly for students who have been historically underrepresented and underserved. The college identifies strategies to monitor and address equity issues, making efforts to mitigate any disproportionate impact on student success and achievement. Our institutional data provides insight surrounding student populations who historically, are not fully represented. SEA addresses disparities and/or disproportionate impact in student success across disaggregated student equity groups including gender, ethnicity, disability status, financial need, LGBTQIA+, Veterans, foster youth, homelessness, and formerly incarcerated students. The SEA Program also houses IVC's Homeless Liaison, Foster Youth Liaison, Formerly Incarcerated Liaison, and Military Affiliated Liaison, who provide direct services and referrals to students in need. SEA strives to empower students experiencing insecurities related to food, housing, transportation, textbooks, and shower access. We recognize that students who struggle meeting their basic needs are also at an academic and economic disadvantage, creating barriers to academic success and wellness. We strive to remove barriers that affect IVC students' access to enrollment, education, degree and certificate completion, and the ability to transfer to a university. SEA also provides outreach at local Imperial County high schools to ensure graduating seniors are successfully matriculated into the college and have a strong support system. Please visit us online for assistance at <https://imperial.edu/students/student-equity-and-achievement/> or call us at 760-355-6465 or when campus reopens, visit Building 401.

#### **What if I cannot afford food, books, or need other help?**

We have many resources that are available to you. Please tell us what you need by submitting your request(s) here: <https://imperial.edu/students/student-equity-and-achievement/>

### **Student Rights and Responsibilities**

Students have the right to experience a positive learning environment and to due process of law. For more information regarding student rights and responsibilities, please refer to the IVC [General Catalog](#).

### **Information Literacy**

Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. The IVC [Library Department](#) provides numerous [Information Literacy Tutorials](#) to assist students in this endeavor.

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<b>Tentative Course Schedule</b>		
<b>Module</b>	<b>Topic, Activities</b>	<b>Week/Date</b>
<b>Orientation</b>	<b>Orientation Module</b> <ul style="list-style-type: none"> <li>• Orientation to the course and online learning</li> </ul> Meet and greet discussion posts	8/17
<b>Module 1</b>	Introduction. The Soils Around Us. Importance of soil in the world (also in California, Imperial Valley) <ul style="list-style-type: none"> <li>• Ecological functions of soil and its role in recycling resources needed for plant growth</li> <li>• Soil constituents and soil's three-phase system</li> <li>• Land use in the United States</li> </ul>	8/17 8/24
<b>Module 2</b>	Soil Formation (origin) and Development <ul style="list-style-type: none"> <li>• The soil body</li> <li>• Soil formation process</li> <li>• Soil Profile</li> </ul>	8/31
<b>Module 3</b>	Soil Taxonomy/Classification and Survey <ul style="list-style-type: none"> <li>• USDA soil classification system</li> <li>• Land/soil capability classes</li> <li>• Geographical Information Systems (GIS) -CIMIS</li> </ul>	9/8
<b>Module 4</b>	Physical properties of soil <ul style="list-style-type: none"> <li>• Soil texture</li> <li>• Soil density; bulk and particle density</li> <li>• Permeability</li> <li>• Soil structure</li> </ul>	9/14
<b>Module 5</b>	Soil Water <ul style="list-style-type: none"> <li>• Characteristics and behavior</li> <li>• Forces and types of soil water</li> <li>• Functions of water in plants</li> </ul>	9/21
<b>Module 6</b>	Soil and the Hydrologic Cycle <ul style="list-style-type: none"> <li>• Evapotranspiration</li> <li>• Condensation</li> <li>• Precipitation</li> <li>• Water run-off</li> </ul>	9/28
<b>Module 7</b>	Soil Aeration and Soil Temperature <ul style="list-style-type: none"> <li>• Porosity</li> <li>• Redox</li> <li>• Saturation</li> </ul>	10/5
<b>Module 8</b>	The Colloidal Fraction <ul style="list-style-type: none"> <li>• Soil Chemical and Physical Activity</li> <li>• Silicate clays</li> <li>• Sesquioxides</li> </ul>	10/12
<b>Module 9</b>	Soil reaction <ul style="list-style-type: none"> <li>• pH</li> <li>• Salinity</li> </ul>	10/19

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Tentative Course Schedule		
	<ul style="list-style-type: none"> <li>• Acidity</li> <li>• Alkalinity</li> <li>• Sodicity</li> <li>• Agricultural limes</li> </ul>	
<b>Module 10</b>	Soil Microbiology: Organisms and Ecology of the Soil <ul style="list-style-type: none"> <li>• Soil fauna</li> <li>• Soil flora</li> </ul>	10/26
<b>Module 11</b>	Soil Organic Matter <ul style="list-style-type: none"> <li>• Role of organic matter</li> <li>• Immobilization</li> <li>• Mineralization</li> </ul>	11/2
<b>Module 12</b>	Nutrient Cycles and Soil Fertility <ul style="list-style-type: none"> <li>• Macro and micronutrients</li> <li>• Nitrogen fixation</li> <li>• N, P, C, S cycles</li> </ul>	11/9
<b>Module 13</b>	Practical Nutrient Management <ul style="list-style-type: none"> <li>• Sustainable use of nutrient resources/fertilizers</li> <li>• Commercial synthetic fertilizers</li> <li>• Organic fertilizers</li> <li>• Soil analysis</li> </ul>	11/16
<b>Thanks</b>	<b>Thanksgiving</b>	11/23
<b>Module 14</b>	Soil Erosion and Its Control <ul style="list-style-type: none"> <li>• Agents of soil erosion</li> <li>• Universal Soil Loss Equation (USLE)</li> <li>• Land Capability Classification</li> </ul>	11/30
<b>Module 15</b>	Soils and Chemical Pollution <ul style="list-style-type: none"> <li>• Toxic substances</li> <li>• Landfills</li> </ul>	12/7
<b>Final Test</b>	<b>Final Comprehensive Test</b>	<b>Final</b>

The date for mid-term test will be announced.

This syllabus is very tentative, so you should follow the instructions to every weekly module instead

**Brady, N. C. & Weil, R. (2019). *Elements of the Nature and Properties of Soils* (4th ed.): Pearson  
ISBN: ISBN-13:9780133254648**