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### Basic Course Information

Semester:	Fall 2021	Instructor Name:	Dr. Michael Kanyi
Course No. & Title	AG 120: Soil Science	Email:	michael.kanyi@imperial.edu
CRN #:	10556	Webpage (optional):	
Classroom:	Online	Office #:	3114
Semester Dates:	August 16, 2020 – Dec 11, 2021	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

Note: This course will use various open/online educational resources (OERs). Reference textbook(s) is optional.

### 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.

*This course will adopt asynchronous mode of instruction. You are therefore advised to allocate ample time for the modular/weekly instructional activities and assignments.*

- You will conduct **virtual lab simulations**. You will require a computer (not mobile phone) and reliable internet.

### 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

## Imperial Valley College AG 120 – Soil Science Course Syllabus

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There will be a **mid-term test (or cumulative quizzes)** and a **final comprehensive test covering all the modules**. The date for mid-term test will be announced. 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. Late submission of assignments must be communicated to the professor before the due date to avoid loss of points. **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%
• <u>Final test</u>	40%
<b>Total</b>	<b>100%</b>

### **Grading Legend**

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

### **Course Policies**

#### **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 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.**

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### **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.

### **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 (!!!)].

### **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.

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.

### **IVC Student Resources**

IVC wants you to be successful in all aspects of your education. 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.

[For help, resources, services, and an explanation of policies, click this link](#) or click the heart icon in Canvas.

### **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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Tentative Course Schedule		
Module	Topic, Activities	Week/Date
<b>Orientation</b>	<b>Orientation Module</b> <ul style="list-style-type: none"> <li>• Orientation to the course and online learning</li> <li>• Meet and greet discussion posts</li> </ul>	8/16
<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>	8/16 8/23
<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> <li>• Negative effect of soil compaction</li> </ul>	8/30
<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>• Remote sensing</li> <li>• Satellite imagery</li> <li>• Geographical Information Systems (GIS) -CIMIS</li> </ul>	9/9
<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>	9/13
<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>	9/20
<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>	9/27
<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>	10/4
<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>	10/11

Imperial Valley College AG 120 – Soil Science Course Syllabus

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<b>Module 9</b>	Soil reaction <ul style="list-style-type: none"> <li>• pH</li> <li>• Salinity</li> <li>• Acidity</li> <li>• Alkalinity</li> <li>• Sodicity</li> <li>• Agricultural limes</li> </ul>	10/18
<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>	10/25
<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>	11/1
<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>	11/8
<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>	11/15
<b>Thanksgiving</b>	<b>Thanksgiving (campus closed)</b>	<b>11/22</b>
<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>	11/29
<b>Module 15</b>	Soils and Chemical Pollution <ul style="list-style-type: none"> <li>• Toxic substances</li> <li>• Landfills</li> </ul>	12/6
<b>Final Test</b>	<b>Final Comprehensive Test</b>	<b>Final</b>

The date for mid-term test will be announced.

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

*\*\*\*This syllabus is subject to change without notice\*\*\**

This syllabus is very tentative, you're therefore advised to follow the instructions provided at the beginning of every weekly module.