

### Basic Course Information

|                    |                                     |  |   |
|--------------------|-------------------------------------|--|---|
| Semester:          | Spring 2024                         | Instructor Name:   | Dr. Michael Kanyi   |
| Course No. & Title | AG 140: Principles of Plant Science | Email:   | michael.kanyi@imperial.edu  |
| CRN #:             | 20562/20974                         | Webpage (optional):                                      |   |
| Classroom:         | 2732 (Hybrid section)               | Office   | 406   |
| Class Dates:       | Feb 12, 2024 – June 8, 2024         | Office hours: Virtual (email, text canvas, pronto, zoom) | MTWR 1:00 pm – 2:00 pm  |
| Class Days:        | Tuesday & Thursday (Hybrid section) | Office Phone #:  | (760)355-5717   |
| Class Times:       | 8:00 am – 9:25 am (Hybrid section)  | Emergency Contact:                                       | Tisha Nelson, Economic & Workforce Development (760) 355-6361/ (760) 355-6161 |
| Units:             | 4                                   | Format   | Hybrid and online   |

### Course Description

An introduction to plant science that examines agriculture, forest, landscape, and other significant uses of plants. Included are structure, growth processes, propagation, physiology, genetic improvement and biotechnology, ecology, soil environment, biological competitors, and symbionts of plants. The production, harvest, and utilization of the principal crops grown in California and the Imperial Valley will be included. Laboratory work is required. (*For Labster Simulations, you will require a computer and internet*). (C-ID AG-PS 106 L) CSU/UC).

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

Although there is no prerequisite requirement for this course, adequate knowledge of general high school biology is expected.

### 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 and discuss the basic needs of plant crops found in Imperial County, California & major crop-producing states in the US (ILO1, ILO2, ILO4).
2. Accurately discuss and explain a crop rotation program as well as the benefits that are derived from that production system (ILO1, ILO2, ILO4).
3. Identify and discuss major crop commodities grown in Imperial County as well as the season that those crops are planted and harvested (ILO1, ILO2, ILO4).
4. Identify and discuss basic pest avoidance procedures for commonly grown crops in Imperial County (ILO1, ILO2, ILO4).

### Course Objectives

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

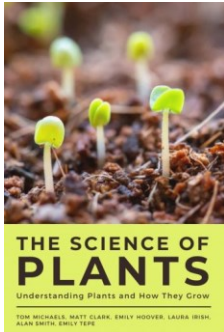
1. Understand human relationships with plants. Recognize the economic importance of agriculture and forestry; the development of cultivated species; agroecology, and the role of the production of crop plants in feeding the world's population.
2. Understand the fundamentals of botany and plant physiology of plant classification, structure, growth, economic botany, and post-harvest physiology.
3. Understand the environmental and economic factors involved in plant production systems. Relate to plant production the environmental parameters of light, temperature, soil, water, pests, and disease, as well as such economic factors as markets and transportation, and ecological factors such as local-scale biodiversity and invasions by exotics.
4. Understand plant improvement, including plant breeding, seed production, and basic processes in plant biotechnology.
5. Understand the issues involved in plant transgenics including food safety and genetic integrity of ecological systems

- and non-transgenic crops.
- Describe the important plant and crop systems such as large-scale industrialized crop production, timber production, organic farming, hothouse production, tropical agriculture and forestry, gardening and landscaping, and plants as art and for decoration.
  - Understand the basic principles of soil management as they relate to soil properties, plant nutrition, fertilization, crop rotation, multiple and relay cropping, tillage, and soil degradation.
  - Understand the basic principles of the management of weeds, arthropods, and pathogens.
  - Understand the basic principles of irrigation as they pertain to crops including types of irrigation, crop water use, and drainage.
  - Recognize areas of harvest and post-harvest handling as they pertain to the different types of crops, and value-added strategies for plants.
  - Describe the scientific method and explain its application in solving problems in plant and soil science.

### Textbooks & Other Resources or Links

This course will primarily use OERs. The resources will be available here on Canvas and will be organized in weekly modules. The main [OER reference textbook](#) information is provided below.

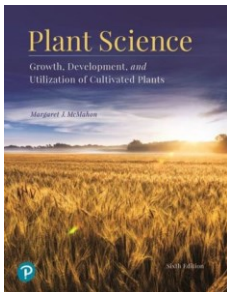
- Michaels, T., Clark, M., Hoover, E., Irish, L., Smith, A., and Tepe, E. (2022). [The Science of Plants: Understanding Plants and How They Grow](#). University of Minnesota Press. ISBN 13: 9781946135872



- Clark, M. A., Choi, J., & Douglas, M. [Biology 2e](#). [Openstax](#)

### Optional Recommended Textbook

- McMahon, Margaret J., Rubatzky, Vincent E. (2020). *Hartman's Plant Science: Growth, Development, and Utilization of Cultivated Plants* (6th ed.): Pearson/Prentice Hall



Note: This course will use various open/online educational resources (OERs).

### Course Requirements and Instructional Methods

- Notes posted in Canvas, instructional YouTube videos, simulated laboratory activities, outside/field practical experience, assignments, quizzes, and tests. Effective participation in all course activities (discussion in Canvas) is highly encouraged and will impact the final grade. Critical thinking approaches to solving agricultural economic issues at the regional, state, national, and global levels will be emphasized.
- Out of Class Assignments (mainly f2f): 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 for a semester. WASC has adopted a similar requirement.

- You will conduct virtual lab simulations that will require a computer (not a 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

There will be a **mid-term test (or cumulative quizzes)** and a **final comprehensive test covering 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. Late submission of assignments must be communicated to the professor before the due date to avoid loss of points.

#### Late Submission Policy

Timely submission of all assignments, quizzes, discussion posts, tests, and other tasks by the due date is required. Therefore, “no late work and submissions policy” will be followed.

Minimally, legitimate circumstances that potentially threaten this policy must be communicated and excusal granted in advance of the submission's due date. There will be a 10% deduction of possible points for a late submission with excusal. If a submission is not made by the due date, and there was no prior excusal, then a zero (0) score will result.

**There will be no make-up tests.**

*The distribution of grading points towards the final grade will be as follows.*

|                            |             |
|----------------------------|-------------|
| • Discussion               | 15%         |
| • Lab /assignments         | 25%         |
| • Quizzes                  | 20%         |
| • Final test (All modules) | 40%         |
| <b>Total</b>               | <b>100%</b> |

#### Grading Legend

A= 100-90%

B = 89-80%

C = 79-70%

D = 69-60%

F =<59%

### Academic Honesty (Artificial Intelligence -AI)

IVC values critical thinking and communication skills and considers academic integrity essential to learning. Using AI tools as a replacement for your own thinking, writing, or quantitative reasoning goes against both our mission and academic honesty policy and will be considered academic dishonesty, or plagiarism unless you have been instructed to do so by your instructor. In case of any uncertainty regarding the ethical use of AI tools, students are encouraged to reach out to their instructors for clarification.

### 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. More information is found in the [General Catalog](#).
- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absence exceeds the 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. 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 (face-to-face on-ground class)**

- 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 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 importance 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 owned 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 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 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 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.

### Other Course Information

*Late submissions will not be accepted.*

### IVC Student Resources

IVC wants you to be successful in all aspects of your education. For help, resources, services, and an explanation of policies, visit the [IVC students' resources](#) or click the heart icon in Canvas.

### Tentative Class Schedule/Calendar

| The week of | Topics, subtopics, and Textbook Chapters   | Chapters                | Module                 |
|-------------|--|-------------------------|------------------------|
| 2/12        | Orientation Module <ul style="list-style-type: none"> <li>Orientation to the course and online learning</li> <li>Meet and greet discussion posts</li> </ul>  | Introduction, chapter 1 | Orientation & Module 1 |
| 2/12        | Introduction: Plants and Humans relationship. <ul style="list-style-type: none"> <li>Horticulture and specialties (olericulture, pomology, post-harvest management)</li> <li>Domesticated and wild plants</li> <li>Benefits of plants to humans</li> <li>Forestry</li> <li>Scientific Enquiry/Method: Science and experimentation</li> <li>Lab report writing</li> </ul> | Chapter 1               | Module 1               |
| 2/19        | Plant Taxonomy, Improvement, and Preservation <ul style="list-style-type: none"> <li>Plant taxonomy(classification).</li> <li>Binomial nomenclature</li> <li>Seed Germination</li> <li>Germplasm preservation</li> </ul>   | Chapter 2               | Module 2               |
| 2/26        | Plant Morphology: Cell, Structure of Higher Plants <ul style="list-style-type: none"> <li>Leaves</li> <li>Stem (shoot)</li> <li>Roots</li> <li>Modified roots and modified stems (vegetative propagation parts)</li> </ul>   | Chapter 3               | Module 3               |
| 3/4         | Plant Growth Patterns and Inflorescences <ul style="list-style-type: none"> <li>Determinate growth</li> <li>Indeterminate growth</li> <li>Inflorescence (simple and compound)</li> <li>Plant Hormones</li> </ul>   | Chapter 4               | Module 4               |
| 3/11        | Internal Structure of Plants (monocotyledons and dicotyledons) <ul style="list-style-type: none"> <li>Leaf anatomy</li> <li>Stems anatomy (vascular bundles)</li> <li>Roots (types)</li> </ul>   | Chapter 5               | Module 5               |
| 3/18        | Cells, Tissues, Meristem, and Woody Growth   | Chapter 6&7             | Module 6               |

|            |  |              |              |
|------------|--|--------------|--------------|
|            | <ul style="list-style-type: none"> <li>• Cell Organelles</li> <li>• Tissues (dermal, meristem, vascular)</li> <li>• Apical and lateral meristems</li> </ul>  |              |              |
| 3/25       | Flower Morphology <ul style="list-style-type: none"> <li>• Parts of a flower</li> <li>• Types of flowers and functions</li> </ul>  | Chapter 7    | Module 7     |
| <b>4/1</b> | <b>Spring Break</b>  | <b>Break</b> | <b>Break</b> |
| 4/8        | Fruit Morphology <ul style="list-style-type: none"> <li>• Parts of a fruit</li> <li>• Types/categories of fruits</li> </ul>  | Chapter 8    | Module 8     |
| 4/15       | Plant Seeds and Sexual propagation. <ul style="list-style-type: none"> <li>• Basic seed morphology</li> <li>• Seed physiology</li> <li>• Seed dispersal</li> <li>• Seed Germination</li> </ul>   | Chapter 9    | Module 9     |
| 4/22       | Asexual Propagation <ul style="list-style-type: none"> <li>• Grafting</li> <li>• Stem layering</li> <li>• Modified organs and vegetative propagation</li> </ul>  | Chapter 10   | Module 10    |
| 4/29       | Water and Light <ul style="list-style-type: none"> <li>• Water absorption</li> <li>• Cohesion, adhesion, capillarity</li> <li>• Evapotranspiration</li> <li>• Photosynthesis</li> <li>• Regenerative Agriculture, Permaculture, Greenhouse, Irrigation</li> </ul>  | Chapter 11   | Module 11    |
| 5/6        | Soil Fertility and Plant Nutrition <ul style="list-style-type: none"> <li>• Soil composition (organic matter and inorganic, air water)</li> <li>• Soil physical characteristics</li> <li>• Soil chemical characteristics</li> <li>• Plant macronutrients and micronutrients</li> </ul>   | Chapter 12   | Module 12    |
| 5/13       | Sexual Reproduction <ul style="list-style-type: none"> <li>• DNA structure and chromosomes (Chromatids, homologous chromosomes)</li> <li>• Meiosis and Mitosis</li> </ul>  | Chapter 13   | Module 13    |
| 5/20       | Plant Breeding <ul style="list-style-type: none"> <li>• Microsporogenesis (male gametogenesis -pollen)</li> <li>• Megasporogenesis (female gametogenesis -ovule)</li> <li>• Pollination and fertilization</li> <li>• Inheritance (genotype, phenotype, environment)</li> <li>• Genes (allele, dominance, recessive)</li> <li>• Mendel's Laws of Inheritance</li> <li>• Punnett square</li> <li>• Monohybrids and dihybrids</li> <li>• Homozygosity &amp; heterozygosity</li> </ul> | Chapter 14   | Module 14    |
| 5/27       | Genetic Engineering (Transgenic/GMO - genetically modified organism) <ul style="list-style-type: none"> <li>• Transgenes</li> <li>• Weeds, invasive plants, and their control</li> <li>• Food safety</li> </ul>  | Chapter 15   | Module 15    |
| 6/3        | <b>The final test will cover all the modules, and it will account for 40% of the final grade.</b>  |              |              |

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This schedule is very tentative and can change without notice. You are therefore advised to follow the instructions provided at the start of each module or week. Any changes to the schedule, including tests and due dates, will be communicated.

Subject to change without prior notice