

**HORT 300 Special Topics  
HYDROPONICS  
Fall 2020  
Wednesday, 1:30-4pm, Skeen W130  
3 credit hours**

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Office Hours: Tues. 1-2 or by appointment

### **COURSE OVERVIEW**

This course will introduce students to the basics of the different soil-less growing systems: hydroponics, aeroponics and aquaponics. Students will learn about nutrient solutions, typical crops grown in soil-less systems and learn to make their own operational systems through hands on labs.

### **COURSE LEARNING OBJECTIVES**

*After completing this course, students will be able to:*

- describe the differences between the 3 major types of soil-less growing systems
- evaluate different crops for each type of system
- identify the components of each system type
- calculate costs to build different systems
- demonstrate how to build and maintain each type of system
- discuss how soilless growing relates to sustainability and local food production

### **COURSE MATERIALS:**

**Required Textbook:** required reading will available through Canvas. You will not be required to purchase a text. Additional readings and videos will be assigned over the semester and posted in Canvas.

**Canvas:** (<http://learn.nmsu.edu>) all materials related to the class will be available through Canvas. Students should make a habit of checking Canvas frequently. Grades, announcements, assignments, lecture powerpoints, etc. will be posted in Canvas. If you have a concern about posted grades, contact the instructor.

**Other required materials:** Everyone must wear masks at all times when we meet. We will be working in the greenhouse, and using our hands a lot. As such, you'll be required to purchase a pair of heavy duty work gloves. You are required to wear closed shoes at all time:

no sandals of any sort. I would also recommend long pants and bringing water with you in a closed, sealed container.

***Class structure:***

This is a brand new course, so it will be evolving through the semester. There is a structure and a schedule, but if we find there are areas and topics we need to delve into more deeply, we will adjust as necessary. Please be patient with changes. I will not change the dates of exams, but the material covered in class may change. I appreciate your flexibility and your enthusiasm in exploring a new course and in helping me build a course that is useful on a practical level as well as educational.

Please expect to do 2-4 hours of reading, etc. outside of class. With only one lab session per week, there will not be time to review everything that is contained in the readings and other materials. I STRONGLY ENCOURAGE you to post discussion questions of things that aren't clear to the Canvas page. I will monitor the discussions but I also encourage YOU all to participate in those discussions.

***Projects***

In all, we will be doing 6 different practical applications of different soilless growing systems. These will include:

- an individual mason jar hydroponics system
- a group aeroponics systems
- a class Dutch bucket system
- a group tower system
- group NFT systems
- a class aquaponics system\*

You will be required to participate in these practical applications. We will all be learning together.

You will also work together on planting and transplanting and the maintenance of your crops, both individual and group.

**ASSIGNMENTS & EXAMS:**

**GRADED ASSIGNMENTS:**

***Attendance and participation***

Because of COVID group size requirements, the lab will be divided into two groups and you will be required to attend your assigned lab section. You cannot switch labs and if you miss your time, you miss that lab. This course will be very hands on and being there to participate will increase your knowledge and retention of the material. If you must be absent, please contact me before if possible. It will be your responsibility to obtain the information from your classmates if you miss classes.

Participation will be a vital component of this course and will be part of your grade. I will observe participation in our interactions during class periods and you will also be asked to grade one another in your group projects. I will ask for feedback from each group member, which will be included in final grade calculations.

Do the required readings before you come to class; what we do in lab will be informed by the readings. I encourage questions, whether in a discussion board or in lab.

Most of all, please come with a good attitude and be ready to explore and experiment. As previously stated, this is a new course and all of us are learning together.

### ***Examinations***

There will be two examinations for this course, on **Sept. 30** and **Nov. 18**. They will focus mainly on the material covered up to that date. An exam review will be posted. There will be no formal final exam, however, a final project will be **due** at the time of the final exam, **Wed., Dec. 9 at 1pm**.

### ***Final project***

A final design project that encompasses and incorporates the entirety of class materials and projects will be due on Wed., Dec. 9 at 1pm. More details and a grading rubric will be presented in class on Nov. 18.

### ***Weekly reflections***

In addition to the practical applications of material, you will be required to do a weekly reflection on the course material and the on-going nature of the hydroponics units. Weekly reflections will be due on Sunday evening by 11:59pm, beginning August 30. Each weekly entry should address:

- 1) Reflection on readings, classroom learning and lab activities. For example: was something in the reading made clearer through the lab activities? What is something new you learned?
- 2) Find a news article that addresses hydroponics or other soilless growing systems, sustainability, local agriculture, pollinators, innovations in growing, etc. Include a link to the article! Briefly summarize the article in your own words and why it is interesting or how it connects to this class. What about the article resonates with you?
- 3) Find a “how to” video relating to soilless growing or other novel, sustainable agricultural systems. Include a link to the video, briefly summarize it and describe how it connects to class, what about it is new to you and/or how it connects to what you’ve learned in this course.

### **Assignment Point Total:**

Attendance and participation (25 points/wk x 12 weeks)	300 points/25%
Peer evaluation of participation	30 points/5%
Exam 1	100 points/15%
Exam 2	100 points/15%
Final project	100 points/15%
Weekly reflections (25 points/wk x 12 weeks)	300 points/25%
<b>TOTAL POINTS AVAILABLE</b>	<b>930 PTS/100%</b>

## **GRADING CRITERIA:**

Points/percentage for grades:

837-930 points/90-100%	A
743-836 points/80-89%	B
649-742 points/70-79%	C
555-648 points/60-69%	D
<554 points or below 59%	F

## **POLICIES**

### **Class Attendance and participation**

This class will be mainly hands on and experiential and as such, I strongly urge you not to miss any classes. Your comprehension of the material will suffer if you are absent. This is a new course and as such, we will ALL be learning together.

### **Late Assignments**

Because of the hands-on nature of this class, late assignments will not be accepted nor will make up assignments be offered except in the case of emergencies and/or with prior approval from the instructor.

### **Email**

Emails will be answered within 24 hours, often far less. Weekends it might be more like 36 hours. I prefer you to email me through Canvas.

### **Cell Phones**

Please turn your cell phone off or to vibrate while in class. During graded exams or other activities, cell phones must be turned OFF.

### **Academic Misconduct**

Academic and non-academic misconduct: The Student Code of Conduct defines academic misconduct, non-academic misconduct and the consequences or penalties for each. The Student Code of Conduct is available in the NMSU Student Handbook online:

<http://studenthandbook.nmsu.edu/>

Academic misconduct is explained here:

<http://studenthandbook.nmsu.edu/student-code-of-conduct/academic-misconduct/>

### **Discrimination and Disability Accommodation**

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act Amendments Act (ADA) covers issues relating to disability and accommodations. If a student has questions or needs an accommodation in the classroom (all medical information is treated confidentially), contact:

Main Campus

Student Accessibility Services (SAS)

Corbett Center Student Union Room 208

Trudy Luken, Director, 575-646-6840, [sas@nmsu.edu](mailto:sas@nmsu.edu)

New Mexico State University, in compliance with applicable laws and in furtherance of its commitment to fostering an environment that welcomes and embraces diversity, does not discriminate on the basis of age, ancestry, color, disability, gender identity, genetic information, national origin, race, religion, retaliation, serious medical condition, sex (including pregnancy), sexual orientation, spousal affiliation, or protected veteran status in its programs and activities, including employment, admissions, and educational programs and activities. Inquiries may be directed to the Laura Castille, Executive Director, Title IX and Section 504 Coordinator, Office of Institutional Equity, P.O. Box 30001, E. 1130 University Avenue, Las Cruces, NM 88003; 575.646.3635; 575-646-7802 (TTY); [equity@nmsu.edu](mailto:equity@nmsu.edu).

Title IX prohibits sex harassment, sexual assault, intimate partner violence, stalking and retaliation. For more information on discrimination or Title IX, or to file a complaint contact: Laura Castille, Executive Director and Title IX Coordinator  
Office of Institutional Equity (OIE) - O'Loughlin House, 1130 University Avenue  
Phone: (575) 646-3635 E-mail: [equity@nmsu.edu](mailto:equity@nmsu.edu)  
Website: <http://equity.nmsu.edu/>

**Other NMSU Resources:**

NMSU Police Department:	(575) 646-3311	<a href="http://www.nmsupolice.com">www.nmsupolice.com</a>
NMSU Police Victim Services:	(575) 646-3424	
NMSU Counseling Center:	(575) 646-2731	
NMSU Dean of Students:	(575) 646-1722	
Any On-campus Emergencies:	911	

**Course schedule (subject to change!)**

<b>Date</b>	<b>Topic</b>	<b>Assignment Due</b>
8/19	Introduction to class and CEA systems On zoom	Read Ch. 1 & 2 (by 8/26)
8/26	Plants in CEA, tour greenhouse, begin IBC aqua system	Read Ch. 5 (by 9/2)
9/2	Basic principles, set up mason jar hydroponics, start seeds	Read Ch. 3 (by 9/9)
9/9	Water, pH and EC Build aeroponics system	Read Ch. 6
9/16	Hydroponics crops	Read Ch. 4 & 7 (by 9/16)
9/23	Insects and pollination	
9/30	<b>Exam 1</b>	Read Ch. 9 & 10 (by 10/7)
10/7	Plant nutrition and nutrient solutions	Read/review Ch. 9 (by 10/14)
10/14	Diagnosing nutrient disorders	Read Ch. 11 (by 10/21)
10/21	Dutch bucket system	Read Ch. 12 (by 10/28)
10/28	NFT system	Read Ch. 13 (by 11/4)
11/4	Ebb and flow system	Read Ch. 14 (by 11/11)
11/11	Greenhouse systems	
11/18	<b>Exam 2</b>	Read Ch. 8 & 15 (by 12/2) <b>Final Project discussion</b>
11/25	<b>No class; Thanksgiving Break</b>	
12/2	Harvesting, marketing and safety of crops	
12/9	Final project due, <b>1pm</b>	