

PRINCIPLES OF CROP PRODUCTION
AGRO 365/HORT 365
Fall 2021



General description:

The overall goal of this course is to introduce and discuss the principles and practices of crop production and management as they are applied nationally and internationally to optimize crop production. The lab component includes comprehensive analysis of real world situations through numerous trips to farmer fields, university research sites, commercial production and processing units. Additionally, the students will have opportunity of a hands-on experience in managing/assisting with crop production plots.

Course catalog description: 4 cr. (3+2P)

Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production. Prerequisite(s): AGRO/HORT 100, CHEM 111G or equivalent and Math 120 or equivalent.

Class meeting times:

Lectures: Tuesdays and Thursdays 09:00-10:15 AM, Online-Zoom

***Labs:** Thursdays 2:35- 4:30 PM, Room W139 Skeen Hall

Instructor:

Dr. Kulbhushan K. Grover

Associate Professor, Sustainable Crop Production

*Room: Skeen N358; Ph. 575-646-2352; Email: kgrover@nmsu.edu

Office hours: By appointment

Teaching Assistants:

-Ms. Harpreet Kaur

PhD Candidate, Plant and Environment Science

Email: harpr123@nmsu.edu

Office hours: Tuesday 2:00-3:00 PM or By appointment

-Mr. Seyed Nourbakhsh

PhD Candidate, Plant and Environment Science; Email: nshahab@nmsu.edu

Office hours: By appointment

Textbook:

Principles of Crop Production: Theory, Techniques, and Technology. (ed) G. AcQuaah. 2005. Text is not required but is recommended. I will put one copy of the book on reserve in Zuhl library.

Course website:

The course website is available at <https://learn.nmsu.edu>. The website will contain important information about announcements and resource materials during the semester. Students must check the course website regularly for course updates and grades.

Classroom policy:

COVID: Please make sure when we meet in person for labs, you follow the COVID restriction protocols as required by the university policy. Face masks are required for indoor class meetings and recommended for outdoor meetings. Please find more information on the latest guidelines provided in the letter from Dr. Ruth A. Johnston, Vice Chancellor and Chief COVID-19 Officer

Academic Misconduct and Plagiarism: Academic misconduct including plagiarism will not be tolerated in the Plant and Environmental Sciences Department. The Department follows the policies and procedures pertaining to academic misconduct and plagiarism found in the NMSU Student Code of Conduct available online at Website: <http://sas.nmsu.edu/>

According to which,

"Academic misconduct includes, but is not limited to, Plagiarism, which includes, but is not limited to, submitting examinations, themes, reports, or other material as one's own work when such work has been prepared by another person or copied from another person." Any student found guilty of academic misconduct shall be subject to disciplinary action.

Depending on the situation, the activity may receive zero points, the student may be asked to leave the class, or the student may be subjected to further disciplinary action at the university level.

Discrimination Policy:

NMSU policy prohibits discrimination on the basis of age, ancestry, color, disability, gender identity, genetic information, national origin, race, religion, retaliation, serious medical condition, sex, sexual orientation, spousal affiliation and protected veterans status. Furthermore, Title IX prohibits sex discrimination to include sexual misconduct: sexual violence (sexual assault, rape), sexual harassment and retaliation.

For more information on discrimination issues, Title IX, Campus SaVE Act, NMSU Policy Chapter 3.25, NMSU's complaint process, or to file a complaint contact:

Lauri Millot, Director and Title IX Coordinator
Agustin Diaz, Associate Director, Title IX Deputy Coordinator
Office of Institutional Equity (OIE) - O'Loughlin House, 1130 University Avenue
Phone: (575) 646-3635 E-mail: equity@nmsu.edu
Website: <http://eeo.nmsu.edu/>

Disability Accommodation If a student has questions or needs an accommodation in the classroom (all medical information is treated confidentially), contact:

Student Accessibility Services (SAS)
Corbett Center Student Union, Rm. 208
Phone: (575) 646-6840
E-mail: sas@nmsu.edu
Website: <http://sas.nmsu.edu/>

Other NMSU Resources:

NMSU Police Department: (575) 646-3311 www.nmsupolice.com
NMSU Police Victim Services: (575) 646-3424
NMSU Counseling Center: (575) 646-2731
NMSU Dean of Students: (575) 646-1722
For Any On-campus Emergencies: 911

Class attendance: Students are required to attend the classes and labs regularly as the attendance will be accounted for the final grade.

Cell phones: Please turn your cell phones to silent mode during the class and turn them off during exam/quiz/presentations. No texting is allowed anytime during the class or lab in session. The instructor reserves the right to take the cell phone away if found being used inappropriately.

Grading:

Quizzes and Exams: There will be six biweekly quizzes/group discussion exercises worth 10 points each and two exams worth 100 points each. The tentative dates for the quizzes and exams are mentioned below and these dates could be changed, if needed with a prior notice. The only acceptable excuse for missing an exam/quiz is a medical condition or emergency with a valid documentation and prior notice/approval of the instructor.

Research Paper: Each student will write a research paper on an assigned topic related to sustainable crop production with focus on cover crops, crop rotation, conservation tillage, soil health and management. I will help you choose the specific topic and approve by the

due dates. The paper should be five pages long with double spaced and font size of 12. You will need to submit at least 10 recent references (last 10 years). You will also give an oral presentation on your paper towards the end of the semester. I will provide you a grading rubric during the semester. The paper and presentation are worth of total 100 points when submitted on due dates as:

Rough draft due in class by: October 28th (40 maximum points)

Final draft (along with rough draft) in class due by: December 9th (30 maximum points)

Oral presentation: December 9th (30 maximum points)

Labs: Labs will provide the students an opportunity to observe and analyze the real world situations in crop production and then relate them to the principles discussed in the lectures. Students will be required to attend all the lab sessions. Missing three labs without a valid excused reason will result in lowering two letter grades and missing four labs will result in "F" grade for that portion of the class.

Cover Crop Management Plot and Field Notes*: Depending upon the space availability at the research farm, each student or a group of students will be assigned a cover crop plot that the student(s) will plant and manage during the semester and make observations. You will earn 25 points for this activity. The detailed instructions for the observations will be provided at appropriate time. The student(s) will make the observations and prepare and submit a final report by the due date of Dec. 9th (25 points). Each student will need to devote at least 5 hours towards management of the plot outside the class time.

***Learning Experience:** To help students get firsthand experience in various aspects of crop production, you are encouraged to devote 5 hours for help at university research plots/farmer's market/industry. Your TA will help you locate the research site for the learning experience. You will earn 25 points for this activity if you provide evidence.

Extra Credit:

There will be opportunity to earn five extra credit points for either i) donating blood (no plasma, please) or ii) attending three consecutive meetings of a student club at the Plant and Environmental Sciences Department (see the department website for more information: <http://aces.nmsu.edu/academics/pes/clubs-and-organizations.html>)

Grading details and scale:

6 bi-weekly quizzes/group exercises each worth 10 pts:	60
2 exams each worth 100 points:	200

Research paper (rough draft):	40
Research paper (final draft):	30
Oral presentation:	30
10 Lab reports/questionnaires/problem sets at 15 pts each:	150
*Cover crop plot management (5 hours outside class time):	25
*Volunteer learning experience (5 hours outside class time):	25
Cover crop management field report:	25
Class attendance 29 lectures at 2 pts each:	58
Lab attendance 15 labs at 3 pts each:	45
Total	688

***These points may change if plot space does not become available as explained above.**

Grading scale:

90-100% A; 80-89 B; 70-79 C; 60-69 D; 0-59 F

Note: Those students, who are taking this class as "Pass/Fail", must at least get "C" grade to get credit.

Tentative Class Schedule, AGRO/HORT 365, Fall 2021

	Class activity	Book Chapter
August	19 Introduction	-
	After successful completion of these activities students will be able to:	
	24 Compare and contrast land preparation methods	15
	26 Differentiate between conventional and conservation tillage	15
☺	31 QUIZ 1	
Sept.	02 Describe process of plant stand establishment	16
	07 Analyze plant structure, development & function	2
	09 Describe branch and tiller development	3
☺	14 PAPER TOPIC DUE TODAY	
	14 Explain reproductive growth and development stages	4
☺	16 Group Discussion 1	
	21 Explain reproductive growth and development stages	4
	23 Examine seed physiology and factors affecting it	-
	28 Describe origin of cultivated plants	-
	30 Explain fundamentals of crop domestication/breeding/GMOs	5
October ☺	05 Group Discussion 2	
	07 Explain fundamentals of crop domestication/breeding/GMOs	13
	12 Debate climatic influences on crop production	6
	14 Debate climatic influences on crop production	6
	18 Last day to drop the course with a 'W'	
	21 Describe and compare cropping systems/rotations	11
☺ October	26 EXAM I (through 10/21 lecture)	

October	28	Describe and compare cropping systems/rotations	11
November ☺	02	PAPER ROUGH DRAFT DUE TODAY	
	02	Describe and compare cropping systems/rotations	11
	04	Explain microbial-plant interactions and their role in crop production	-
☺	09	Group Discussion 3	
	11	Describe role of soil management in crop production	7
	16	Recognize importance of soil water for crop growth	9
	18	Analyze soil water characteristics and factors affecting its availability	9
☺☺	23	THANKSGIVING HOLIDAY- NO CLASS	
☺☺	25	THANKSGIVING HOLIDAY- NO CLASS	
	30	Discuss weed control techniques	10
December	02	Explain disease and insect pest management	10
December	07	EXAM II (through 12/03 lecture)	
December	09	Oral presentations* (8:00- 10:00 AM, Online/ or Skeen W139*)	
December	09	Final drafts of paper due (8:00- 10:00 AM, Online/ or Skeen W139)	
December	09	Field reports due (8:00- 10:00 AM, Online/ or Skeen W139)	

*will be confirmed later in the semester

Tentative Lab Activity Schedule, AGRO/HORT 365, Fall 2021

Lab activity		Place to visit
After successful completion of these activities students will be able to:		
August	19	No lab
	26*	Compare and contrast land preparation methods
		Skeen Lab, W139
September	02	Identify and calibrate farm implements
	09*	Learn cover crop/vegetable planting techniques
	16*	Know the seed testing and certification process
		NMSU Fabian Garcia farm
	23	Manage weeds in cover crops and vegetables
	30*	Calibrate the planter and calculate seed rates
		NMDA Lab, 3190 S. Espina
		Skeen Lab, W139
October	07*	Learn about Sustainable Bioeconomy in Arid Region
	14	Observe and measure plant growth and development
	21*	Explain procedures for diagnosing plant diseases and pest attacks
	28*	Analyze practices and issues for pecan production
	04*	Conduct soil health tests and interpret results
		NMSU Fabian Garcia farm
		NMSU Fabian Garcia Farm
		NMSU Plant Diagnostic Center
		Lyendecker, Fabian Garcia
		Lyendecker/Fabian Center
November	11*	Analyze practices and issues for organic field crop production
	18*	Harvest vegetables, observe cover crops
		Alvarez Farms, Anthony
		NMSU Fabian Garcia Farm
☺☺	25	THANKSGIVING HOLIDAY- NO LAB
December	02	Evaluate cover crops and make recommendations- quiz 6
		NMSU Fabian Garcia Farm

Labs marked with an asterisk (*) require either a 1-2 page essay to be written (single-spaced typed), or completion of a take home problem set as assigned during the semester. Essays and problem sets must be turned in by the following laboratory (i.e. next week) or be penalized 10% for each day late.

We will meet in *W139 Skeen Hall for labs or as announced in the class. Please make sure to be in lab on time as we will be leaving promptly for field visits. Please come prepared for the field trips

and wear appropriate clothes and shoes; bring sunscreen, hat, sunglasses, and water to drink. Some of the labs particularly the field visits outside NMSU may take longer than the class period, so we might be back on campus after the class time.

NOTE: Please note that the information provided in the syllabus including the lecture/lab schedule is tentative and is subject to change. You will be notified of any changes if and when they become necessary.

Zoom/online class etiquette

Follow best practices for online learning environment.

Online Class Etiquette

BE ON TIME Be prepared. Check your tech before class. 	PRESENTATION Check your surroundings. Dress appropriately. 
MUTE YOURSELF Be sure to mute your microphone, when joining class. 	HEADPHONES Use headphones if you have them. 
PARTICIPATION Be focused. Pay attention. Be an active participant. 	CHAT RESPONSIBLY Ask/Post only class related questions and comments. 