

**Agricultural Systems Management 323: Post-Harvest Technology**  
**Fall 2021 Syllabus**  
**Credit: 3; Class #11413**

**Instructor:** Nurun Nahar, [Nurun.Nahar@ndsu.edu](mailto:Nurun.Nahar@ndsu.edu), 701.799.1264 (cell)  
**Learning:** Tuesday and Thursday, 9:30 –10:45 a.m. through Zoom  
**Student Hours:** Tuesday and Thursdays 11 a.m. to 12:00 p.m. through Zoom. Students are also welcome to text, call or send questions via e-mail.  
**ZOOM Meeting URL:** <https://ndsu.zoom.us/j/93289126977>

This course is for students interested in managing or operating grain storage and handling systems, understanding how storage and handling affect grain quality, and understanding factors that affect system performance and efficiency. This course should be useful in your career if you work with a farm, elevator, or processor that handles and manages grain.

**Prerequisites:** Math 103 or 104 or higher.

**Course Description:** Principles and management of crop and feed storage, handling, drying, processing, and crop/feed systems siting, planning, and development.

**Learning Objectives:** Students are expected to develop an understanding of:

1. Grain storage fundamentals (e.g., air-moisture relationships, grain quality, and drying, energy use)
2. The interaction of grain storage and handling components and management of energy use, and grain quality
3. Develop the ability to perform basic calculations associated with handling, storing, and processing grain
4. Grain handling/storage system planning
5. Grain drying systems
6. Grain and seed processing
7. Safety principles as part of managing a grain storage and handling system.

**Required Text:**

Maier, D., McNeill, S., Hellevang, K. 2017. Grain drying, handling and storage handbook. 3rd edition. MWPS-13. Iowa State University. Ames, IA.

**Modes of Presentation:**

- Lecture with Power Point
- Video Presentation
- Guest Speakers
- Problem-solving

**Other References:**

- Grain Quality Care: a Grower's Quick Reference. 2014. John Gnadke, Advanced Grain System, Inc. Printed by DuPont Pioneer.
- On-Farm Drying and Storage Systems. O.J. Loewer, T.C. Bridges, R.A. Bucklin. 1994. ASAE. ISBN 0-929355-53-9.

- Postharvest Technology and Food Process Engineering. 2014. Chakraverty, A. and Singh, R. P. CRC Press, Taylor and Francis Group, New York.
- Managing Stored Grain to Preserve Quality and Value. 2006. Reed, Carl. AACC Int. St. Paul, MN
- Dry Grain Aeration Systems Design Handbook. Midwest Plan Service. 1997. MWPS-29, Edition, Iowa State University, Ames, IA
- Processing Equipment for Agricultural Products. Hall, C. W., and D. C. Davis. 1979. AVI Publishing Company.

### **Resources needed by the Students:**

- Access to Blackboard for lecture materials. Skim slides in BB prior coming to class.
- The class does not follow the required text chapter by chapter, but may skip around. Lecture and discussion will clarify where relevant information can be found.
- Notes/slides should be printed/downloaded ahead of class so that you can add to them.
- Some materials may be distributed in class to facilitate discussion.
- During class there will be an group work assignment or worksheet that is completed, to facilitate discussion (not graded) or to earn points
- Blackboard will be used for announcements, homework assignments, class presentations, and temporary grades.
- The textbook and a calculator

### **Taking notes and in-class material:**

- There happens to be no “perfect” text for this course. The class does not follow the required text chapter-by-chapter, but may skip around. Lecture and discussion will clarify where information can be found.
- Skim slides in BB prior to coming to class. Notes/slides should be printed/downloaded ahead of class so that you can add to them. Not all information needed for exams and assignments is given explicitly on each slide.
- Some materials may be distributed in class and BB to facilitate discussion or to earn points.

### **Grading:**

You will have the following categories of work in the course. Your final grade in the course will be determined by a grade percentage ranging from 0 to 100%. The weighted grade percentage will be converted to a letter grade using the following straight grading scale.

<b>Item</b>	<b>% of total grade</b>
Exam #1	15%
Exam #2	15%
Final Exam	25%
Group Project (written report and presentation)	15%
Homework or Assignments	10%
Quizzes and In-Class activities	10%
Lab	10%
<b>Total</b>	<b>100%</b>

**The cut off for letter grades are: 90% = A; 80% = B; 70% = C; 60% = D**

**Exams, Group Project, HW Assignment, Quizzes, Class Activities and Participation Policies:**

There will be two exams and a final exam during the semester (see schedule). Exams will be based on lectures, in-class discussions, homework, and other activities. The exams will be combinations of types of questions, which may include short answer, problem-solving, multiple-choice and rational, and fill in the blank questions, depending on what works best for the material covered. The final exam will be comprehensive. **Exams (3 exams) will be in-person @ Room ABEN 201.**

**Group Project:** Students will work in a group of three in post harvest technology related topics.

**Homework and Assignments** are a critical component in learning course concepts, as they assess students understanding of subject matter prior to taking an exam. Homework (HW) and assignment will be given throughout the semester. All work and calculations used must be shown in an organized manner. Homework or assignments submitted late without permission of the instructor may be reduced by ~5% each day. Consult with the instructor regarding maximum penalties. If you are sick, notify the course instructors as soon as practical, so that accommodations can be made. In this course Blackboard will be used for assignment submission (and grading) for all students.

**In-Class Activities and Participation** will be assessed in the form of in-class worksheets (google docs), quizzes, and informal discussion.

**Attendance:** *Your attendance and full participation is expected*, through synchronized online classroom discussions, volunteering answers to questions, asking appropriate questions, thoughtful evaluation of a team oral presentation, and by helping to create a spirit of cooperation within the class. **You are required to attend lab demonstrations and exams in-person.**

**Attendance Expectations** Class attendance is expected in accordance with NDSU University Senate Policy 333: Class Attendance Policy and Procedure (<https://www.ndsu.edu/fileadmin/policy/333.pdf>). All class materials will be posted on the BB.

- Students are expected to attend every class lecture virtually (synchronous)
- Students are expected to attend the lab and three exams in person.
- While the late participation policy for this course is outlined below, please note that I will be flexible regarding deadlines for students who are experiencing illness or other challenges related to COVID-19. Please contact me as early as possible if you think you may not be able to complete an assignment or participate in the course due to illness.

**Specify steps to take regarding student illness.**

- If you are unable to attend class at the regularly scheduled time due to illness, contact the instructor for alternate arrangements, including recordings of class sessions and assignments as well as accommodations and extensions as needed.
- If you are absent from class as a result of a COVID-19 diagnosis or quarantine, the decision for approval of all absences and missed work is determined by the course instructor. As instructor, I will do the following to help you make progress in the course:
  - o You will be able to submit assignments and take exams remotely.
  - o Other remote learning options will be determined on a case-by-case basis.

## **Copyright of Course Materials**

Refer to NDSU [Policy 190](#) on Intellectual property.

*In this course recording the lectures is prohibited with your own personal devices (without prior express approval from the instructor).*

*In this course recording the lectures for anything other than personal use is prohibited.*

## **FACE COVERING POLICY**

*NDSU requires students and faculty to wear face coverings in classrooms. Wearing face coverings helps reduce the risk to others in case you are infected but do not have symptoms. Students who need accommodation due to disability or who have accessibility considerations should contact Disability Services at 701-231-8463. ([https://www.ndsu.edu/admission/risk\\_reduction\\_guidelines](https://www.ndsu.edu/admission/risk_reduction_guidelines))*

## **Additional Resources for Students**

*As a member of the NDSU community, resources are available for you should you need help in dealing with adverse reactions to things happening in the world today. A variety of resources are listed below:*

For students on campus and remotely (telehealth):

Counseling Services: 701-231-7671; <https://www.ndsu.edu/counseling/>

Disability Services: 701-231-8463; <https://www.ndsu.edu/disabilityservices/>

Student Health Service: 701-231-7331; <https://www.ndsu.edu/studenthealthservice/>

Dean of Students Office: 701-231-7701; <https://www.ndsu.edu/deanofstudents/>

In a crisis or emergency situation:

Call University Police: 701-231-8998

Call 9-1-1

Go to a Hospital Emergency Room

Go to Prairie St. Johns for a Needs Assessment: 701-476-7216 (510 4th St. S.)

Call the FirstLink Help Line: 1-800-273- TALK (8255)

## **Important Notification:**

**Academic Honesty:** *All students taking any course in the College of Agriculture, Food Systems, and Natural Resources are under the Honor System (<http://www.ag.ndsu.edu/academics/honor-system-1>). (The CAFSNR Website is undergoing change and there will be a new web address at some point during the semester). The Honor System is a system that is governed by the students and operates on the premise that most students are honest and work best when their honesty, and the honesty of others, is not in question. It functions to prevent cheating as well as penalize those who are dishonest. It is the responsibility of the students to report any violations of the honor pledge to the instructor, honor commission or the Dean of the College of Agriculture, Food Systems, and Natural Resources.*

*The academic community is operated on the basis of honesty, integrity, and fair play. [NDSU Policy 335: Code of Academic Responsibility and Conduct](#) applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the [Office](#)*

of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at [www.ndsu.edu/academichonesty](http://www.ndsu.edu/academichonesty).

**Students with special requirements:** Any students with disabilities or other special needs, who need special accommodations in this course are invited to share these concerns or requests with the instructor as soon as possible. The instructor may ask for verification and that, plus other assistance, can be requested from Disability Services in the Lower Level of the NDSU Library (231-8463). <http://www.ndsu.edu/disabilityservices/>.

**Veterans and military personnel:** Veterans or military personnel with special circumstances or who are activated are encouraged to notify the instructor as early as possible.

### **Important Dates**

September 1	Last day to add classes via Campus Connection
September 1	Last day for no-record drop of classes @ 100% refund
September 1	Last day to withdraw to 0 credits @ 100% refund
<b>September 6</b>	<b>Labor Day holiday (no classes/offices closed)</b>
September 7	Financial Aid applied to Student Accounts
September 13	Last day to submit request to audit, pass/fail
October 15	Undergraduate fall graduation application due
October 15	Graduate student Intent to Graduate due
October 15	Grades of Incomplete convert to F
October 28	Spring/ Summer registration begins
<b>November 11</b>	<b>Veteran's Day (no classes/offices closed)</b>
November 12	Last day to drop classes with 'W' record
November 12	Last day to withdraw to zero credits for Fall
November 19	Fall commencement participation deadline
<b>November 24-26</b>	<b>Thanksgiving no classes (offices open on Friday)</b>
December 6-10	Dead Week
December 13-17	Final Examinations
December 17	Commencement

**Dead Week Policy:** The NDSU Dead Week policy is available at <http://www.ndsu.edu/registrar/dates/deadweek/>

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**ASM 323 Tentative Lecture Schedule as of Aug 23/2021 (subject to change at any time)**

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Week		Month	_	Date	Topic
1		Aug		24(T)	Course overview, Expectation; Student info & Intro; Syllabus; Grain Handling Facility_Elevator_Planning
				26 (Th)	Grain Moisture and Management; Problem Solving (PS): MC Shrinkage
2		Aug		31 (T)	Pilot Plant Lab 1 (Moisture Determination, Test Weight)
		Sept		2 (Th)	Grain Handling_Harvesting-Receiving Problem Solving_Grain Receiving Capacity
		Sept 6 <sup>th</sup>		Labor Day (M)	
3				7 (T)	Lab 1 Report Grain Handling_Conveying, Grain Handling_Augers
				9 (Th)	Problem Solving_Conveying Augers
4		Big Iron		14 (T)	HW 1: Harvesting receiving capacity and augers Belt Conveyors_PS
				16 (Th)	Bucket Elev_PS
5				21 (T)	HW 2: Big Iron Make your own Quiz & Exam 1 Review
				23 (Th)	EXAM 1 @ABEN 201 (In-person), class time
6				28 (T)	Grain drying Basics and Process
				30 (Th)	Grain drying Economics
7		Oct		5 (T)	HW 3: Drying
				7 (Th)	Energy efficient grain drying (KH, ABEN)
8				12 (T)	HW 4: Drying Economics Basics of Psychrometrics, Application of Psychrometrics
				14 (Th)	Grain Storage Fundamentals & Storage Facilities
9				19 (T)	HW 5: Storage Capacities; Grain Storage Management_Aeration
				21 (Th)	Grain Storage Management_Air Distribution
10				26 (T)	HW 6: Air Distribution
				28 (Th)	PS: Fan selection
11		Nov		2 (T)	Review/IN class PS
				4 (Th)	EXAM 2@ABEN 201 (In-person), class time
12				9 (T)	Locating and developing grain center
				11 (Th)	Veterans Day
				16 (T)	Seed cleaning and processing (Brian Otteson, Agronomy Seed Farm)
13				18 (Th)	Pilot Plant Lab 2 (Grain/seed and cleaning)
				23 (T)	Lab 2 Report Group Project Meeting
14				25 (Th)	Thanksgiving
				30 (T)	Grain quality (Kia Mikesch, North Dakota Grain Inspection Agency)
15		Dec		2 (Th)	Safety in grain handling facilities; Project contract and checklist
				7 (T)	Group project presentation (4 groups)
16		Dead week		9 (Th)	Group project presentation (2 groups) and Grain grading locating and development of grain center (Project report due)
				14 (T)	Review for Final
Final		Dec 17		17 (Friday)	Final Exam @ABEN 201 (In-person), 8-10 AM

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