

Agricultural Systems Management 323: Post-Harvest Technology
Fall 2019 Syllabus
Credit: 3; Class #11413

Instructor: Nurun Nahar, Nurun.Nahar@ndsu.edu, 701.231.7140, ABEN 119

Learning: Monday, Wednesday and Friday, 9:00 –9:50 a.m., ABEN 201

Office Hours: Thirty minutes after the class. Students can also meet instructor by appointment. Drop-ins are acceptable at other times but instructor availability cannot always be guaranteed. Students are also welcome to call or send questions via e-mail.

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. Gain 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
- Low Temperature & Solar Grain Drying Handbook. Midwest Plan Service. 1980. MWPS-22. 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.
- Not all information needed for exams and assignments is given explicitly on each slide.
- 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 to facilitate discussion. Otherwise, materials will be posted in the BB.
- During class there will be an assignment or worksheet that is completed, 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. Homework assignment, Quiz and test scores will be posted on Blackboard for informational purposes only.

<u>Item</u>	<u>% of total grade</u>
Exam #1 (50 min)	25%
Exam #2 (50 min)	25%
Final Exam (2 hrs)	30%
Homework or Assignments (5-10)	10%
<u>In class Activities/ Quizzes/Trips</u>	<u>10%</u>
Total	100%

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

Exams, Homework Assignment, Quizzes, Participation and Plant Trips Policies:

There will be 2 exams and a final exam during the semester (see schedule). All exams will be closed book and closed notes. 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.** If you have a conflict, you must discuss it with me at least 48 hours in advance.

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.

In Class Activities and Participation will be assessed based on attendance, discussion and ability to solve problems. These may be in the form of in class worksheets, “quizzes” and informal discussion.

Plant Trips are a unique way to learn concepts and information presented in class. Most trips will take more time than the formal class period, so trips will be announced well in advance as they are confirmed. Assignments based on the trip may be given.

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. If you miss class, the instructor will provide handouts upon your return if asked; you are responsible for obtaining notes from a classmate.

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 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.

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 2	Labor Day holiday (no classes/offices closed)
September 4	Last day to add classes via Campus Connection
September 4	Last day for no-record drop of classes @ 100% refund
September 4	Last day to withdraw to 0 credits @ 100% refund
September 10	Financial Aid applied to Student Accounts
September 16	Last day to submit request to audit, pass/fail
September 20	Undergraduate fall graduation application due
September 20	Graduate student fall Graduate Degree applications due
October 18	Grades of Incomplete convert to F
November 4	Spring registration begins
November 11	Veteran's Day (no classes/offices closed)
November 15	Last day to withdraw to 0 credits
November 15	Last day to drop classes with record (W)
November 27-29	Thanksgiving (offices open on Friday)
December 2	Fall commencement participation deadline
December 9-13	Dead Week
December 16-20	Final Examinations
December 20	Commencement

Use of Cell Phones, iPods, MP3 Players, and Other Electronic Devices:

All participants in this class are subject to NDSU University Senate Policy 158: Acceptable use of Electronic Communications Devices (<http://www.ndsu.edu/fileadmin/policy/158.pdf>).

As a courtesy to other students and the instructor, all cell phones, iPods, MP3 players, and other electronic devices except handheld calculators should be turned off or placed in a vibrate-only mode during class time. Initiating phone calls, text message, or other types of messages during class time - including those to friends, family, classmates, coworkers, or supervisors—is unacceptable unless there is a genuine emergency. Examples of emergencies include weather-related school closing announcements; fire, bomb, or other threats to public safety and well-being; and other incidents in which the NDSU system is or could be activated to provide broadcast messages to the NDSU community.

Use of cell phones or other portable electronic devices for communication, transmission, retrieval, or storage of information during the administration of a test or quiz may be considered an incident of **academic dishonesty**. One exception to this policy is the use of handheld calculators for computational purposes. Use of cell phones or similar devices as a calculator during tests and quizzes will not be allowed because it is difficult to distinguish such activity from sending and receiving text messages, which could obviously be interpreted as a form of academic dishonesty.

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

Learning is an active process from teaching and learning perspectives. Teachers and students have a strong responsibility to one another.

My obligations as a teacher include

- (a) planning and providing effective learning experiences
- (c) convey expectations and requirements for each assignment
- (d) evaluating work fairly.

Student obligations include

- (a) preparing for each class and completing assignments
 - (b) participating actively and positively in the learning process
 - (c) expressing needs to the instructor
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ASM 323 **Tentative** Lecture Schedule as of 9/23/2019 (subject to change at any time)

#	Month	Date	Topic
1	Aug	28(W)	Course overview, Expectation; student info & Introduction
2		30 (F)	Syllabus, Grain Handling Facility_Elevator_Planning
	Sep	2 (M)	Holiday: Labor Day
3		4 (W)	Grain Moisture and Management
4		6 (F)	Problem solving (PS): MC Shrinkage
5	Big Iron 10-12	9 (M)	(HW1: MC) Grain Handling_Harvesting-Receiving
6		11 (W)	Problem Solving_Grain Receiving Capacity
7		13 (F)	Grain Handling_Conveying
8	B. Iron Ass 2	16 (M)	(HW2: Big Iron) Grain Handling_Augers
9		18 (W)	Conveying Augers: PS
10		20 (F)	Calculations_Augers and start Belt Conveyors
11		23 (M)	Belt Conveyors: PS and start Bucket Elev.
12		25 (W)	(HW3: G. Receiving and Augers): Ardent Mill visit (First 20 mins) Bucket Elevators: PS
13		27 (F)	Exam 1 Review (Make your own Quiz)
14		30 (M)	EXAM 1
15	Oct (G. Lec)	2 (W)	Grain drying Basics
16		4 (F)	Grain drying process_
		7 (M)	(HW4: Drying) Grain Drying Economics_ PS
17		9 (W)	Energy efficient grain drying (KH, ABEN)
18		11 (F)	Basics of Psychrometrics
19		14 (M)	(HW5: Drying cost) Application of Psychrometrics_In Class PP
20		16 (W)	Grain Storage Fundamentals
21		18 (F)	Storage Facilities
22		21 (M)	(HW6 Storage capacities) Seasonal grain storage and management (KH, ABEN)
23		23 (W)	Grain Storage Management_Aeration
24		25 (F)	Grain Storage Management_Air Distribution
25		28 (M)	Air Distribution
26		30 (W)	In class PP_Psychrometric and Duct design
27	Nov	1 (F)	Review/ In class PP
28		4 (M)	EXAM 2
29		6 (W)	Dust explosion and Safety
30		8 (F)	Safety in Grain Handling Facilities
		11 (M)	Holiday: Veterans Day
31		13 (W)	Locating & developing grain center
		15 (F)	Locating & developing grain center
32		18 (M)	Grain Sampling and Cleaning Intro
33		20 (W)	Seed cleaning and processing (Brian Otteson, Agronomy Seed Farm)
34		22 (F)	Pilot Plant Lab (Confirmed)
35		25 (M)	Hands-on grain grading at NCI (Brian Sorenson) (Confirmed)
		27-29	Holiday: Thanksgiving
36	Dec	2 (M)	Grain Moisture_Test weight_Grain grading
37		4 (W)	Project Contract and Checklist
38		6 (F)	Grain Quality (Mycotoxin) (Lab Assignment due)
39	Dead Week	9 (M)	Review 1 (Last Quiz)
40	Dead Week	11(W)	Review 2
	Dead Week	13 (F)	Review
Final	Dec 16-20	20 (F)	Final Exam 8:00-10:00 am at ABEN 201