

**MR110**  
**Grain Harvesting Systems**

**3 Credits**

Instructor: John Lundy

Original Developer: Robert Baron

Current Developer: John Lundy

Reviewer: Kyle Kipps

Created: 01/09/1987

Revised: 15/05/2019

Approval: 29/08/2019

The Implementation Date for this Outline is 01/09/2019

Copyright©LAKELAND COLLEGE. E-mail: [admissions@lakelandc.ab.ca](mailto:admissions@lakelandc.ab.ca)  
2602 - 59 Avenue, Lloydminster, Alberta, Canada T9V 3N7. Ph: 780.871. 5700  
5707 College Drive, Vermilion, Alberta, Canada T9X 1K5. Ph: 780.853.8400  
Toll-free in Canada: 1 800 661 6490



## MR110 Version: 19



# Grain Harvesting Systems

## Calendar Description

This course covers all aspects of modern grain harvesting equipment. The design, adjustment, and operation of the swather and of the various combine configurations are studied in the classroom, lab, and field in the appropriate season. Harvest management systems are investigated in some detail through discussion of grain conditioning, drying, straight combining, in-field grain transport systems, and other techniques.

## Rationale

This is a required course for Crop Technology students. Harvest, for a grain farmer, represents the materialization of all his or her year's work. Significant income is realized every hour of harvest. The capital invested in harvesting equipment is huge. Improper or inappropriate adjustment, maintenance or operation could result in substantial financial loss. The intent of this course is to prepare the student to prevent expensive problems at harvest.

## Prerequisites

None

## Co-Requisites

None

## Course Learning Outcomes

Upon successful completion of this course, students will be able to

1. **use knowledge of equipment operation and personal safety to safely operate and maintain harvest equipment**

### Objectives

- a. Identify safety hazards associated with grain harvesting and handling equipment.
- b. Demonstrate safe practices of working with farm equipment and machinery.
- c. Perform daily maintenance on harvest equipment to enhance safe and efficient operation.

2. **determine optimal use of available equipment and make appropriate decisions related to harvest timing and options.**

**Objectives**

- a. Identify when various crops can be safely and efficiently harvested.
- b. Differentiate the pros and cons of swathing crops vs. direct cut harvesting them.
- c. Describe and compare field to storage strategies and capacities options farmers have available to them.

3. **determine optimum combine and swather settings and adjustments necessary to ensure that crops are harvested at the highest quality and minimal losses.**

**Objectives**

- a. Analyze the functional processes of harvesting equipment.
- b. Measure and quantify harvest losses.
- c. Identify grain quality concerns of inappropriate harvest settings.
- d. Summarize the settings and variables which affect the quality and loss outcomes of each functional process.

4. **work within a team environment to harvest a grain crop in a timely manner.**

**Objectives**

- a. Operate equipment with confidence, knowing the crop is being harvested with the lowest loss, damage, and dockage.

## **Resource Materials**

### ***Required Text:***

Students receive handouts and electronic publications that are required reading.

### ***Reference Text:***

Copies of the following textbook(s) are on reserve at the Library for your reference.

Griffin, G. A. (2013). *Combine harvesting, Fundamentals of machine operation* (6th ed.). Moline, IL: John Deere and Company.

## **Conduct of Course**

The course work involves approximately 40 hours of classroom lecture and discussion and 32 hours of lab work. Course information, including notes, lectures, and required reading assignments are available to students on the D2L course website. Students should check this web page frequently for new information and announcements. Data will be collected by harvest groups when weather and crops permit, and discussions based on the collected data will be conducted through D2L. While labs are scheduled at certain times and days, you can expect lab times to occur on any weekday between the hours of 12 pm and 7 pm outside of other class times. Due to the nature of the class, the majority of the labs will be complete before November with two or three labs required after November 1.

A significant portion of the course involves harvesting the crop that has been reserved for the Student Managed Farm. The MR110 class has the responsibility of ensuring that this crop be

harvested at its optimum. **Expect to spend time outside of class on days that involve field work including weekends.** Students must have written the Lakeland College Equipment Operator Safety Exam and complete the on-machine check off sheet as soon as possible. Students will not be allowed to operate equipment unsupervised until the safety exam and the machine check off sheet are complete.

### Evaluation Procedures

The final grade is an aggregate of the following components:

Midterm Exam	25%
Final Exam	35%
In-field labs and written assignments (5):	
- Collect and present data in a graph or chart - 5 @ 3%	15%
- Discussions on collected data - 5 @ 5%	<u>25%</u>
Total	100%

Discussion assignments have specific due dates and times. Missed due dates are assigned a mark of "0", as the timeliness of the discussions is important to the learning in the course.

Marks are converted to a letter grade as on the scale under the heading Grade Equivalencies and Course Pass Requirements.

To obtain a 1.0 grade you must have a 50% overall average.

Lakeland College is committed to the highest academic standards. Students are expected to be familiar with Lakeland College policies related to academic conduct and academic honesty and to abide by these policies. Violations of these policies are considered to be serious and may result in suspension or expulsion from the College.

### Grade Equivalents and Course Pass Requirements

*A minimum grade of D (50%) (1.00) is required to pass this course.*

Letter	F	D	D+	C-	C	C+	B-	B	B+	A-	A	A+
Percent Range	0-49	50-52	53-56	57-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-100
Points	0.00	1.00	1.30	1.70	2.00	2.30	2.70	3.00	3.30	3.70	4.00	4.00

**Students must maintain a cumulative grade of C (GPA - Grade Point Average of 2.00) in order to qualify to graduate.**

## Attendance

Classroom and laboratory attendance is considered vital to the learning process and as significant to the students' evaluation as examinations and reports.

- a. Students having a combination of excused and/or unexcused absence of 20 percent or higher for the scheduled course hours will be required to withdraw and will automatically receive a "RW" (required withdrawal) for the course, regardless of any other evaluation results. (RW is a failing grade.)
- b. An excused absence is one that is verified with your Instructor. Verification should be prior to the absence or the next class day following the absence. Verification of the absence may take the form of a note from your doctor/College nurse regarding illness, or a note from another Instructor regarding a field trip or other activity, or authorization by your Instructor. An unexcused absence is anything NOT verified by the instructor prior to the absence or the next class day following the absence.

NOTE: Any exceptions to the above attendance policy (e.g. timetable conflicts, work-related issues) must be approved in writing by the Department Chair prior to the beginning of the course.

It is the students' responsibility to know their own absentee record.

Normal hours are 8:30 a.m. to 6:30 p.m., with potential for evening courses, exams or extended field trips. Students are expected to be available for classes during these times.

## Course Units/Topics

1. Farm equipment safety and exam
2. Daily maintenance of harvest equipment
3. Harvest Decisions
  - a) Staging crops to maximize quality and minimize losses
  - b) Swathing vs. Straight-cutting
4. Minimizing Losses & maximizing efficiencies of Swathers and Swathing
  - a) Swather Types
  - b) Swather Adjustments

5. Minimizing Losses & maximizing efficiencies of Combines and Combining
  - a) Combine Types and Sizes
  - b) Cutting and Feeding
  - c) Threshing
  - d) Separation
  - e) Cleaning
  - f) Material Handling
  - g) Rotary vs. Conventional
  
6. Grain Harvesting Systems
  - a) Electronic Monitoring
  - b) Drying Methods, Equipment and Theory
  - c) Field to Storage" Grain Transportation Options"



Copyright©LAKELAND COLLEGE.  
2602 - 59 Avenue, Lloydminster, Alberta, Canada T9V 3N7. Ph: 780 871 5700  
5707 College Drive, Vermilion, Alberta, Canada T9X 1K5. Ph: 780 853 8400  
Toll-free in Canada: 1 800 661 6490 E-mail: [admissions@lakelandcollege.ca](mailto:admissions@lakelandcollege.ca)