

**UNIVERSITY OF MANITOBA
DEPARTMENT OF BIOSYSTEMS ENGINEERING**

COURSE OUTLINE

BIOE 0600 FARM MACHINERY

INSTRUCTORS

D.J. Johnson
A210 Ag Eng Bldg
Ph: 474-9640

J.D. Philp
A208 Ag Eng Bldg.
Ph: 474-7965

The instructor (D. Johnson) is available for individual student consultation from 9:00 am to 4:00 pm Monday to Friday, excluding lecture hours.

OBJECTIVE

To teach the Diploma Agriculture students the principles of the operation of basic farm implements with emphasis on seeding, tillage, haying and harvest machines including their selection, adjustment, efficiency and cost of operation with respect to test data.

LECTURES

Three hours of lectures per week in one term.

1. Farm Safety
2. Tillage
 - 2.1 Equipment choices and characteristics
 - 2.2 Principles of hitching
3. Transmission of Power
 - 3.1 Variations among P.T.O.
4. Hydraulics
 - 4.1 Basic principles of hydraulics
 - 4.2 Components
 - 4.2.1 Pump: gear vane and piston
 - 4.2.2 Valves
 - 4.3 Different systems
 - 4.3.1 Open and closed centre
 - 4.3.2 Load sensing systems
 - 4.4 Hydrostatic transmission
5. Seed Equipment
 - 5.1 Comparison of different seeding machines
- advantages, disadvantages, variations
 - 6.2 Furrow openers available

6. Haying Equipment
 - 6.1 Quality factor
 - 6.2 Considerations in machine selection
 - 6.3 Equipment available
7. Sprayers
 - 7.1 Components
 - 7.2 Calibration
 - 9.3 Innovations in sprayers
8. Harvesting Equipment
 - 8.1 Swathers
 - 8.2 Headers
 - 8.3 Conventional combines
 - 8.4 Rotary combines
 - 9.5 McCloud Harvester
9. Machinery Costs
 - 9.1 Leasing, renting, buying equipment
 - 9.2 Cost calculations
 - 9.3 Farm Machinery Act
10. Guidance Systems

LABORATORIES

One laboratory period per week.

1. Tillage equipment
2. Seeding equipment
3. Combines - Principles of operation and adjustment
4. Hydraulics
 - 4.1 Pumps
 - 4.2 Cylinders/motors
 - 4.3 Circuits
5. Sprayer pumps/nozzles
6. Swathers
7. Leasing vs buying equipment

EVALUATION

- 55% on written final examination
- 25% on one written term test (**Approximately end of October**)
- 20% on laboratory assignments

Sufficient evaluation feedback will be given prior to voluntary withdrawal deadline date.

ACADEMIC DISHONESTY

All applicable rules and regulations published in this year's University of Manitoba General Calendar, including those on academic dishonesty, plagiarism, cheating, and examination impersonation are to be read and followed.

Reproduction of another student's work is not acceptable.

TEXTBOOK

No textbook required.

REFERENCES

Reference Material - (In Agriculture Library), John Deere “Fundamentals of Operation” series

- Tractors TL 233.2 + 73 1994
- Combines Harvesting S695G74 1991
- Hay & Forage S 715 F67 1993
- Planting S 675 B79 1992
- Tillage S 604 B82 1993
- Preventive Maintenance S 675 H38 2000
- Machinery Management S 675 S56