

AGRO 8202
Breeding for Quantitative Traits in Plants
3 credits

INSTRUCTOR: Dr. Rex Bernardo
Professor and Endowed Chair in Corn Breeding and Genetics
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SCHEDULE: 10:15 to 11:25am on Tuesdays and Thursdays, 306 Borlaug Hall. Our class time will comprise small-group problem sets, discussions, and short lectures. You are expected to read the assigned chapter pages **prior to class**. Tests will be held on four Wednesdays, with the time to be arranged.

COURSE COALS: Most economically important traits in crops are quantitative rather than qualitative. It is therefore fitting that we study how quantitative genetics applies to plant breeding. My goals and expectations in AGRO 8202 are for you to:

1. Understand fundamental concepts of population and quantitative genetics;
2. Explore how quantitative genetics principles can help a plant breeder design and implement a breeding program; and
3. Appreciate the theory, experimental approaches, and evidence that form the basis for these concepts and breeding strategies.

I will emphasize the learning of concepts rather than retention of factual information and formulas that can be easily looked up in a textbook. Small group exercises will focus on problem-solving skills and analytical thinking.

COURSE DESCRIPTION: We will study the following major topics: plant breeding and population genetics; creating breeding populations with high means; creating breeding populations with large genetic variances; selection in populations and among crosses; and exploiting DNA marker information in breeding.

The course prerequisites are as follows:

- AGRO 5021 (*Introduction to Plant Breeding*)
- STAT 5021 (*Statistical Analysis*)
- An attitude of patience and hard work (whining and complaining are not allowed)

A formal list of **Learning Objectives** will guide you throughout the course. The exams will be closely based on these learning objectives.

POLICIES:

- **Academic dishonesty** of any kind or degree will not be tolerated. I expect you not only to exercise academic honesty but also to strive for the higher standard of being beyond reproach.
- **Attendance** during each session is expected and required.
- **Make-up work for missed exams** will be allowed only if you have a valid, documented reason.
- **Office hours** are by appointment.
- **Students with a documented disability** should get in touch with the Disability Services office and me within the first three weeks of the semester to make any needed arrangements.

REQUIRED CLASS MATERIALS:

Bernardo, R. 2012. **Breeding for Quantitative Traits in Plants**. 2nd edition, Stemma Press, Woodbury, MN.

GRADING:

Grades will be based on the following:

- **Four 40-minute tests** (60 points each, 240 points total, 60% of grade)
- **Attendance and participation** (40 points, 10% of grade)
- **Cumulative final exam** (120 points, 30% of grade)

Grades will be determined from the total number of points (out of 400) accumulated. The preliminary grading scale is as follows:

A	93 to 100%
A-	90 to 92.9%
B+	87 to 89.9%
B	83 to 86.9%
B-	80 to 82.9%
C+	77 to 79.9%
C	73 to 76.9%
C-	70 to 72.9%
D+	67 to 69.9%
D	63 to 66.9%
S	at least 70%
F	less than 63%

I may decrease (but not increase) the cut-off percentages for each grade.