The Grain Crops
(3.0 credits)

Normally Offered: Fall every other year (even numbered years only). By Albert Ayeni.

Pre-requisites and other registration restrictions:
01:119:115 (General Biology) or equivalent. Course is recommended especially for juniors and seniors (and graduate students as well) with strong background in agricultural and food sciences; and interest in international perspectives in agricultural, food and biofuels issues.

Format: Two 80-minute lectures

Description:
This course dwells on major cereal grain crops (Graminae or “grass” or “monocot” plants with fruit described as caryopsis) including wheat, rice, corn (maize), barley, sorghum, millet, triticale, rye, oats, etc.; grain legumes (soybean, black eyed pea) and pseudo grains (amaranth, quinoa) that have been part of agriculture since human civilization. Historically, these crops are known for their high food energy value for humans and livestock. The global energy challenges of the 21st century have added another dimension to the significance of grain crops as sources of bioenergy, compelling a fresh look at their production potential to meet the competing demands for food, feed and biofuels. This class will teach the production principles of grain crops; postharvest handling; utilization options; international trade and implications of these various aspects for the grain crops industry in the United States. Global job opportunities in the grain crops industry for the plant science graduate will also be explored.

Learning Goals:
• Learn the definition of grain crops from botanical and utilization perspectives
• Understand the food, feed and bioenergy significance of grain crops in the US
• Learn the grain crop production and management practices including agronomic, crop improvement and protection strategies
• Understand the grain crop harvesting and postharvest handling techniques, including primary processing, transportation and storage.
• Understand the general principles of grain crop marketing and international trade.
Measures of Assessment:
- Two class exams (Mid-semester and Final) (60%)
- Class presentation (30%)
- Class participation (10%)

Course Website:
Sakai or eCompanion

Topics:
- Definition & description
- Historical perspectives
- Global & domestic significance
- Classification
- The biology of grain crops
- Yield limiting factors
- Crop improvement options
- Agronomy of grain crops
- Field management of grain crops
- Post-harvest handling
- Grain crop marketing & international trade
- Job opportunities for the plant science graduate

Required and Recommended Course materials:
This course will draw on relevant textbooks, recent reviews and articles from the scientific literature, as well as articles from the popular and business press. Recommended course materials will be announced in class and also posted on the course web site as necessary.

Policies for Exams, Assignments, Attendance, and Grading
Student knowledge and understanding will be assessed through (a) the mid-term and final exams (60%); (b) a class presentation (30%) developed around a topical issue on grain crops and class participation comprising attendance and contribution to class discussions (10%). Class attendance is required in this course. Throughout the semester a maximum of three classes may be missed without excuse or reason. Additional absences without a reason attested by Rutgers authority will be penalized to a maximum of 10% of total class grade assigned to class participation.

Other Information:
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