

Outline
Introductory Crop (Plant) Science

Credit: 4 semester hours

No Prerequisite

Course Description:

IAI description: AG 903: *Introduction to Crop or Plant Science* (4 semester hrs)

The basic principles of plant growth, including human and environmental influences and the theoretical and practical application of agronomic principles to crop production. Includes the historical and economic importance of crop plants for food, feed, and fiber; origin, classification, and geographic distribution of field crops; environmental factors and agronomic problems; crop plant breeding, growth, development, and physiology; cropping systems and practices; seedbed preparation, tillage, and crop establishment; pests and controls; and harvesting, storing, and marketing practices.

Objectives:

1. To develop an appreciation of the importance of crops on world food production.
2. To develop an understanding of the basic principles of plant growth and the influence of humankind and the environment.
3. To develop an appreciation of the theoretical and practical of agronomic principles.
4. To be able to organize, interpret, and apply data.

Suggested Texts:

Barden, Halfacre and Parrish, Plant Science, McGraw-Hill Publishing Company, 1987.

Janick, Jules, Schery, Robert W.; Woods, Frank W.; Plant Science: An Introduction to World Crops, W.H. Freeman and Company.

Mullen, Agronomy Principles and Practices, 3rd Edition, 1996.

Illinois Agronomy Handbook, Current Edition on Web. <http://web.aces.uiuc.edu/iah>

Introduction to Plant Science, Parker, Delmar Publishers, 2000

How Soybean Plant Develops, Internet: <http://www.agron.iastate.edu/soybean/beangrows.html>

How Soybean Plant Develops, Internet: <http://maize.agron.iastate.edu/cornngrows.html>

Laboratory:

Drallmeier, Teyker, and Moore, Crop Science: A Laboratory Manual, VoAg Service, UIUC, 1988.

Elkins, Donald M., Laboratory Manual for Crop Science, Iowa State Press, 1990.

Suggested References and/or Supplemental Texts:

Aldrich, Scott and Leng, Modern Corn Production, A and L Publications.
Scott and Aldrich, Modern Corn Production, S and A Publications, 2001.
Illinois Pesticide Applicator Training Guide-Current.
Plant Pathology-Plant Disease Series, University of Illinois.
ITCS - Field Crops Scouting Manual-University of Illinois
Chapman and Cater, Crop Production, Principles and Practices, W.H. Freeman and Co., 1976.
Martin, Leonard, and Stamp, Principles of Field Crop Production, 3rd Edition, MacMillan, 1976.
CES Pest Management and Crop Development Bulletin (weekly during the growing season)
Pioneer & Purdue (CD) on Corn Growth and Development
How the Corn and Soy Plant Develops (Iowa State Extension Publication), on Net
Plants, Genes and Agriculture (No citation available)
Weeds of N.C. States
Nebraska Weeds
Nebraska Insects
Crop Production, 4th Edition, AC Seibert and J.J. Vorst, Purdue
Corn & Soybean Field Guide, 1998 Edition, Purdue
Crop Production Evolution, History, Technology; John Wiley & Sons

Alfalfa Management Guide, NCR 547

It is recommended that individual instructors develop detailed behavioral (measurable) objectives for specific lectures of subject matter areas.

Videos and Software:

Ag Explorer CD – Identification CD

Topics:

Periods

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| I. Importance of Crop Plants-Food, Feed, Fiber | 2-4 |
| A. Contribution | |
| 1. To humankind and their welfare | |
| 2. To GNP | |
| 3. To state gross product | |
| 4. To balance of trade, etc. | |
| B. Historical Significance | |
| C. Economics | |
| 1. Social | |
| 2. Comparative Advantages | |
| 3. Markets | |
| 4. Transportation | |
| 5. Population | |
| II. Origin Classification, and Geographic Distribution of Field Crop | 2-3 |

III.	Important Field Crops of the World	1-3
	A. Grain	
	B. Oil	
	C. Fiber	
	D. Sugar	
	E. Drug	
	F. Forage	
	G. Others	
IV.	Crop Environmental Factors	4-6
	A. Air	
	B. Light	
	C. Moisture (Water)	
	D. Temperature	
	E. Soil	
V.	Agronomic Problems, Perceptions and Questions	3-4
	A. World Population and Food Supply	
	B. Pollution-Air, Water, Soil	
	C. Organic and Sustainable Agriculture	
	D. Energy	
	E. Pesticides and Human Health	
VI.	Growth and Development of Crop Plants	4-6
	A. Botany of Plant	
	1. Anatomy	
	2. Morphology	
	B. Identification	
	1. Seeds	
	2. Crop Plants	
	C. Form and Function	
	1. Structure	
	2. Function	
	D. Crop Propagation	
	1. Asexual Propagation-Vegetative	
	2. Sexual Propagation-Seed	
	a. Seed Quality	
	b. State Laws	
	c. Crop Improvement Association (certified seed)	
	E. Growth Regulation and Development – Plant Regulators in Agriculture Today and in the Future	
VII.	Crop Physiology	4-6
	A. Essential Elements and Plant Nutrition	
	B. Role of Water and Water Management	
	C. Photosynthesis and Food Storage	

VIII.	Cropping Systems and Practices	5-7
	A. Monoculture	
	B. Rotation	
	C. Multiple Cropping and Intercropping	
	D. GIS/GPS Site Specific Applications	
	E. Organic Cropping Systems	
	F. Seedbed Preparation	
	G. Stand Establishment-Seedling Methods, etc.	
	H. Conservation Tillage Systems and Practices	
IX.	Crop Pests (Enemies) and Control	4-6
	A. Crop Pests	
	1. Insects	
	2. Diseases	
	3. Seeds	
	4. Nematodes	
	B. Controls (integrated Pest Management)	
X.	Harvesting, Storing, and Marketing Practices	1-2
XI.	Crop Breeding and Improvement	3-5
	A. Genetics	
	B. Introduction	
	C. Selection	
	D. Hybridization	
	E. Mutation	
	F. Genetic Engineering/GMO's	
	G. Value added traits	

Laboratory Suggested:

Use of live plants or a series of demonstrations from seed to mature plant development.

Examples:

Seed identification

Fertilization and Seed Formation

Germination of Field Crops

Morphology of Grasses

Morphology of Legumes

I.P.M. and Scouting

Grain Grading and Crop Judging

Seed quality and certification

Vegetative and Floral Identification of Crops and Weeds

Emergence and Seedling Development of Monocots (corn) and Dicots (Soybeans)