# Agriscience II
## A Model Course Guideline

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Louisiana Department of Education
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# Foreword

*Agriscience II Curricular Guidelines* is a model designed to assist in developing a rigorous and relevant course of study for Agriscience II, a course approved in the Secondary Science Program of Study (*Bulletin 741: Louisiana Handbook for School Administrators*, 1997-2000). The model includes a brief outline and more detailed course guidelines that embrace the core content essential skills and understandings embodied in *Compliance Handbook 308: Louisiana Science Framework* (May 1997)(formerly *Bulletin 1962*). It also presents a discussion of standards-based curriculum, the use of technology, inquiry-based science, laboratory safety, assessment, and the concept of rigorous and relevant learning for *all students.*

The intended audience for this publication includes science teachers, agriculture instructors, science chairpersons, supervisors of science and/or agriculture, local curriculum developers, and school administrators who are involved in secondary science curriculum development and committed to high quality science education.

# Agriscience II

**Course Description**

Agriscience II builds and expands on the knowledge gained in Agriscience I. Laboratory units include animal science, soil science, plant science, agricultural mechanics, food science technology, and agricultural leadership.

*Prerequisite: Agriscience I
**One elective credit in science may be awarded for completing both Agriscience I and Agriscience II.

## CONTENT OUTLINE

I. Personal Career Development

- A. Agricultural Careers
- B. Personal, Social, and Technical Competencies for Employment
- C. Employment

II. Developing the Supervised Agricultural Experience Program (SAE)

- A. Improving the Supervised Agricultural Experience to Fit Individual Career Goals
- B. Record Keeping and the Agricultural Portfolio

III. Agricultural Leadership

- A. Leadership Training
- B. Personal Participation in Agricultural Activities

IV. Animal Science

- A. Animal Reproduction
- B. Animal Nutrition

V. Soil Science

- A. Soil Fertility
- B. Soil Water
- C. Soil Classification and Land Judging
- D. Soil Conservation

VI. Agriculture and Environmental Science

A. Point and Nonpoint Pollution
B. Environmental Protection

VII. Entomology

A. Insects Affecting Plants
B. Urban Entomology

VIII. Plant Sciences

A. Plant Classifications
B. Plant Reproduction
C. Plant Diseases
D. Plant Science Careers

IX. Agricultural Mechanics

A. Construction Processes
B. Small Gasoline Engines
C. Metal Technology

**Model Curriculum Guidelines**

| Agriscience II | |
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| **TOPICS** | **BENCHMARKS** |
| I. Personal Career Development<br><br>A. Agricultural Careers<br>1. Classify occupations found in the agriculture industry<br>2. Determine training and educational requirements for agricultural careers<br><br>B. Personal, Social, and Technical Competencies for Employment<br>1. Identify personal assets and interests related to making a career choice<br>2. Match personal traits with career choices<br><br>C. Employment<br>1. Create a resume<br>2. Organize a job search for a selected agricultural position<br>3. Discuss personal characteristics that affect job performance and maintenance | |
| II. Developing the Supervised Agricultural Experience Program (SAE)<br><br>A. Improving the Supervised Agricultural Experience to Fit Individual Career Goals<br>1. Review and update the individual SAE plan to match student career goals<br>2. Review and amend student career path plan for education and training to match student career goals<br><br>B. Record Keeping and the Agricultural Portfolio<br>1. Review and update the student's SAE portfolio<br>2. Develop budgets for planning the SAE program<br>3. Complete a sample end-of-year analysis of student SAE records | |

| Agriscience II | |
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| **TOPICS** | **BENCHMARKS** |
| III. Agricultural Leadership<br><br>A. Leadership Training<br>1. Develop and present a six-minute speech on an agricultural topic<br>2. Participate in parliamentary law exercises<br>3. Develop a chapter program of activities<br><br>B. Personal Participation in Agricultural Activities<br>1. Review and update student FFA participation plan<br>2. Select FFA and FFA-related activities to incorporate into student SAE plan to match student career goals | |
| IV. Animal Science<br><br>A. Animal Reproduction<br>1. Describe the reproductive processes in animals and poultry<br>2. Explain the relationships among chromosomes, DNA, genes, RNA, and proteins<br>3. Compare and contrast mitosis and meiosis<br>4. Analyze transmission of traits from parent to offspring using pedigree and progeny test results<br>5. Describe the anatomical and physiological processes involved in reproduction of animals and poultry<br>6. Differentiate among the breeding methods used for animals and poultry production<br><br>B. Animal Nutrition<br>1. Discuss the function of each nutrient group in animal and poultry nutrition<br>2. Identify the primary sources of each basic nutrient group<br>3. Compare and contrast the digestive systems of ruminants, nonruminants, and poultry<br>4. Formulate a ration for a ruminant and a nonruminant animal | LS-H-A2-, A3<br>LS-H-B1-B4<br>LS-H-F1<br><br>SI-H-A1, A3<br>LS-H-E2<br>LS-H-F1-F3<br>LS-H-G1<br>SE-H-AE<br>SE-H-B6 |

| Agriscience II | |
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| **TOPICS** | **BENCHMARKS** |
| V. Soil Science | |
| A. Soil Fertility | |
| 1. Classify the nutrient requirements for plant growth | ESS-H-B1 |
| 2. Differentiate among fertilizer formulations | LS-H-F2 |
| 3. Develop a fertilization plan for a specified crop | PS-H-D2, D4 |
| B. Soil Water | |
| 1. Explain the relationships between soil properties and water retention | SE-H-B2, B4, B5 |
| 2. Explain the relationships between soil water and plant growth | SE-H-D4 |
| 3. Develop a plan for controlling soil water | |
| C. Soil Classification and Land Judging | |
| 1. Explain the soil classification system | SE-H-A3, A8 |
| 2. Use soil surveys and land use maps to evaluate land for agricultural use | SE-H-B1-B6<br>SE-H-C1-C5 |
| 3. Participate in the Louisiana FFA Soil Judging Contest | SE-H-D1, D2,<br>SE-H-D5, D6 |
| D. Soil Conservation | |
| 1. Explain how the major types of soil erosion affect the environment and agricultural production | ESS-H-B3 |
| 2. Describe factors that influence soil erosion | SE-H-A1-A7, A11 |
| 3. Evaluate the effectiveness of erosion prevention procedures | SE-H-B1, B2,<br>B4-B6<br>SE-H-C1, C2, C4<br>SE-H-D1-D6 |
| VI. Agriculture and Environmental Science | |
| A. Point and Nonpoint Pollution | SE-H-A9, A11 |
| 1. Differentiate between point and nonpoint pollution | SE-H-B1-B6 |
| 2. Identify major agricultural sources of nonpoint pollution | SE-H-C1, C2,<br>C4, C5 |
| 3. Evaluate the effectiveness of methods used to decrease agricultural nonpoint pollution | SE-H-D1-D6 |

| Agriscience II | |
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| **TOPICS** | **BENCHMARKS** |
| B. Environmental Protection<br>1. Identify major environmental impacts of agriculture<br>2. Describe how chemicals move through the environment<br>3. Analyze systems developed to reduce agricultural impact on the environment | SE-H-A1-A11<br>SE-H-B1-B6<br>SE-H-C1-C5<br>SE-H-D1-D6 |
| VII. Entomology<br><br>A. Insects Affecting Plants<br>1. Differentiate between harmful and beneficial insects<br>2. Describe insect life cycles<br>3. Correlate types of crop damage to insect types<br>4. Classify insects by traits and structures<br>5. Develop an integrated pest management (IPM) plan for protection of a specific crop<br><br>B. Urban Entomology<br>1. Identify the major termite species<br>2. Explain the life cycle of a termite colony<br>3. Identify signs of termite infestations<br>4. Develop a plan for protection of agriculture structures from termies | LS-H-C4-C6<br><br>LS-H-D3 |
| VIII. Plant Sciences<br><br>A. Plant Classification<br>1. Differentiate between the scientific kingdoms used to classify of organisms<br>2. Describe the levels of classification within the plant kingdom<br>3. Explain the need for scientific nomenclature in agriculture | LS-H-C4, C5, C6 |

| Agriscience II | |
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| **TOPICS** | **BENCHMARKS** |
| B. Plant Reproduction<br>1. Describe factors that contribute to the production of quality plants<br>2. Apply genetic principles to plant breeding practices<br>3. Demonstrate common pollination and propagation methods for selected plants<br><br>C. Plant Diseases<br>1. Differentiate between bacteria, fungi, and viruses<br>2. Explain how each type of pathogen causes diseases in plants<br>3. Recognize symptoms of major plant diseases<br>4. Use the disease triangle to develop a plant disease prevention plan<br><br>D. Plant Science Careers<br>1. Investigate forestry careers in Louisiana<br>2. Classify horticulture careers<br>3. Investigate research and science careers related to plant production | LS-H-A1-A3<br>LS-H-B1-B4<br>LS-H-C6<br>LS-H-E3<br><br>LS-H-C7<br>LS-H-F2, F3<br>LS-H-G2-G4 |
| IX. Agricultural Mechanics<br><br>A. Construction Processes<br>1. Practice power tool safety<br>2. Explain the purpose and use of power tools<br>3. Describe the correct operation of selected power tools<br>4. Complete a bill of materials for a project<br>5. Plan and construct a project<br><br>B. Small Gasoline Engines<br>1. Describe the principles of operation for the small engine<br>2. Select appropriate engines for identified applications<br>3. Describe forces that cause engine wear<br>4. Repair, service, and maintain a 4-stroke engine<br>5. Contrast and compare a 4-stroke and a 2-stroke engine<br>6. Repair, service, and maintain a 2-stroke engine | |

| Agriscience II | |
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| **TOPICS** | **BENCHMARKS** |
| B. Metal Technology<br>1. Properly set up and use an oxy-acetylene torch for cutting mild steel<br>2. Explain the process occurring in arc welding<br>3. Demonstrate the ability to complete common welds using the arc welder | |

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