

# COURSE DESCRIPTION (DISTRICT)

## A. COVER PAGE

Date of Submission (Please include Month, Day and Year)	
<b>1. Course Title</b> Agriculture Science 1	<b>9. Subject Area</b> <input type="checkbox"/> History/Social Science <input type="checkbox"/> English <input type="checkbox"/> Mathematics <input type="checkbox"/> Laboratory Science <input type="checkbox"/> Visual & Performing Arts <input type="checkbox"/> Intro <input type="checkbox"/> Advanced <input checked="" type="checkbox"/> <b>College Prep Elective</b>
<b>2. Transcript Title(s) / Abbreviation(s)</b> Ag Sci 1	
<b>3. Transcript Course Code(s) / Number(s)</b> AG6294      AG6295	
<b>4. School</b> Santa Maria High School	
<b>5. District</b> Santa Maria Joint Union High School District	
<b>6. City</b> Santa Maria, CA 93455	<b>10. Grade Level(s) for which this course is designed</b> <input checked="" type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/> 11 <input type="checkbox"/> 12
<b>7. School / District Web Site</b> <a href="http://www.smjuhsd.k12.ca.us">http://www.smjuhsd.k12.ca.us</a>	<b>11. Seeking "Honors" Distinction?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>8. School Course List Contact</b> Name: Jim Armstrong Title/Position: Asst. Supt. Curric/Instruction Phone: 922-4573                      Ext.: 4211 E-mail: <a href="mailto:jarmstrong@smjuhsd.org">jarmstrong@smjuhsd.org</a>	<b>12. Unit Value</b> <input type="checkbox"/> 0.5 (half year or semester equivalent) <input checked="" type="checkbox"/> 1.0 (one year equivalent) <input type="checkbox"/> 2.0 (two year equivalent) <input type="checkbox"/> Other: _____
<b>13. Is this an Internet-based course?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No If "yes", who is the provider? <input type="checkbox"/> UCCP <input type="checkbox"/> PASS/Cyber High <input type="checkbox"/> Other _____	
<b>14. Complete outlines are not needed for courses that were previously approved by UC. If course was previously approved, indicate in which category it falls.</b>  <input type="checkbox"/> A course reinstated after removal within 3 years. Year removed from list? _____ Same course title? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If no, previous course title? _____  <input type="checkbox"/> An identical course approved at another school in same district. Which school? _____ Same course title? <input type="checkbox"/> Yes <input type="checkbox"/> No If no, course title at other school? _____  <input type="checkbox"/> Year-long VPA course replacing two approved successive semester courses in the same discipline <input type="checkbox"/> Approved Advanced Placement (AP) OR International Baccalaureate (IB) course <input type="checkbox"/> Approved UC College Prep (UCCP) Online course <input checked="" type="checkbox"/> Approved CDE Agricultural Education course <input type="checkbox"/> Approved P.A.S.S./Cyber High course	

- Approved ROP/C Course. Name of ROP/C? \_\_\_\_\_
- Approved A.V.I.D. course
- Approved C.A.R.T. course
- Approved Project Lead the Way Course
- Other. Explain: \_\_\_\_\_

15. Is this course modeled after an UC-approved course from another school outside your district?  Yes  No

If so, which school(s)? \_\_\_\_\_

Course title at other school \_\_\_\_\_

**16. Pre-Requisites**

Algebra 1 or concurrent enrollment

**17. Co-Requisites**

Agriculture Biology (year 2)

18. Is this course a resubmission?  Yes  No

If yes, date(s) of previous submission? \_\_\_\_\_

Title of previous submissions? \_\_\_\_\_

**19. Brief Course Description**

The Agriculture Science 1 course is designed to include units in: California Agriculture, Principles of Soil Science, the Environment and Earth's Resources, Applied Agri-science and Technology and Agriculture Research. This course provides students with critical thinking and leadership development skills via the FFA student agricultural experience project is required for all students.

**B. COURSE CONTENT**

Please refer to instructions

20. Course Goals and/or Major Student Outcomes

21. Course Objectives

22. Course Outline

23. Texts & Supplemental Instructional Materials

24. Key Assignments

25. Instructional Methods and/or Strategies

26. Assessment Methods and/or Tools

**C. HONORS COURSES ONLY**

Please refer to instructions

27. Indicate how this honors course is different from the standard course.

**D. OPTIONAL BACKGROUND INFORMATION**

Please refer to instructions

28. Context for Course (optional)

29. History of Course Development (optional)

# **Agriculture Science 1**

## **Meets the UC “g” Admission Requirement**

### **I. COURSE INFORMATION:**

- A. Course Title: Agriculture Science I
- B. Grade Level: 9-12 Grades
- C. Length of Course: 1 year
- D. Prerequisites: Algebra 1 or Concurrent Enrollment
- E. Credit: 10 Units

### **II. MAJOR GOAL AND STUDENT OUTCOMES:**

- A. The Agriculture Science I course is offered to first year agriculture students who are planning to major in agriculture in college or university. The course is designed in conjunction with Agriculture Biology our meet UC requirements and California State Standards for Biological Sciences. It has been designed to provide students with a unique perspective of agriculture and its impact on America Society. It also provides students with critical thinking and leadership development skills via the Future Farmers of America (FFA), as well as foundation skills and knowledge in the seven program areas of agriculture.
- B. The Agriculture Science I course is designed to be both academically challenging and demanding. Students will be expected to not only acquire knowledge, but also to organize, analyze, evaluate, predict, problem solve and apply this knowledge. The student must be able to read and comprehend a variety of materials; demonstrate writing skills that convey ideas in written and visual form; speak with clarity, meaning, and confidence, exhibit creativity; use technology in research and accessing information; appreciate and respect individual and cultural differences; and demonstrate the ability to work collaboratively.

### **III. MAJOR OBJECTIVES:**

- A. The course objectives are as follows:
  - 1. Define agriculture and the agricultural industry.
  - 2. Describe important needs and sources of food and fibers.
  - 3. Explain ecosystems and their impact on agriculture.
  - 4. Explain the importance of standard measurements in agriculture.
  - 5. Understand how new energy sources are developed from agricultural products.
- B. Using the Science of Computation
  - 1. Define the important terms and concepts in Agriscience measurements and computations.
  - 2. Explain the use and importance of standard measurement.
  - 3. Make measurements of length, temperature, and weights.
  - 4. Calculate area and volume of objects of various shapes.
  - 5. Explain important characteristics of biological organisms.
  - 6. Explain life span and its stages.
  - 7. Explain heredity and genetics in agriculture.
  - 8. Define plant and distinguish plants from animals.

9. Explain asexual and asexual propagation in plants.
10. Explain and understand the major organ systems of animals.
11. Name and describe the major animal groups.
12. Explain the food nutrients needed by animals and plants.
13. List examples of plant and animal classifications.
14. Understand health concerns and diseases of animals.
15. Learn leadership skills associated with the FFA.
16. Develop a Supervised Agricultural Experience Project.
17. Develop an understanding of data entry in record books.

#### **IV. Course Outline**

- A. Meeting Human Needs in Changing World
  1. Define agriculture and agribusiness
  2. Describe how the agriculture industry meets human needs for food, fiber, and shelter.
  3. Identify the origin of food and fiber items.
  4. Describe the areas of the agriculture industry that affects our quality of life.
  5. Contrast the interrelations of agriculture and society at the local, state, national, and international levels.
  6. Economic impact for leading agricultural commodities.
- B. Using Applied Sciences and Technology
  1. Explain how the areas of Science relate to Agriscience.
  2. Apply the scientific method.
  3. Explain the laws and regulations concerning biotechnology.
  4. Describe the role and uses of Technology.
  5. Understand public concern for technological advancements in agriculture, such as Genetically Modified Organisms (GMO's).
- C. Agriculture, the Environment and Earth's Resources
  1. Describe Key agricultural environmental impacts on earth resources: soft, water, and air.
  2. Explain ecosystems and how they work.
  3. Understand current agricultural environmental challenges.
  4. Compare and contrast practices for conserving renewable/non-renewable resources.
  5. Explain pollution and identify sources of pollution.
  6. Understand how new energy sources are developed from agricultural products.
- D. Using the Science of Computation
  1. Define the important terms and concepts in Agriscience measurements and computations.
  2. Explain the use and importance of standard measurement.
  3. Make measurements of length, temperature, and weights.
  4. Calculate area and volume of objects of various shapes.
- E. Determining the Bases of Life
  1. Understand the purpose and anatomy of cells
  2. Describe how cell parts function.
  3. Explain and describe various cell functions.

4. Describe the differences between plant and animal cells
5. Describe the life processes in organisms

#### F. Classifying and Naming Living Things

1. Describe the classification systems for living things.
2. Explain taxonomy.
3. Use a classification key to identify leaves.
4. Describe how classification systems are useful in agriscience and technology

#### G. Applying Plant Science Principles

1. Define plant science and how plants differ from animals.
2. Label the parts of a plant and describe their functions.
3. Explain the life cycle of a plant
4. Observe the effects of light on plant growth.
5. Observe the effect of gravity on plant growth.

#### H. Plant Propagation and Reproduction

1. Explain the processes for the propagation of plants.
2. Label the parts of a plant and explain their functions.
3. Determine viability of seeds by using germination and vigor tests.
4. Explain the importance of imported seeds.
5. Analyze suitable common feed ingredients for ruminant, monogastric, equine, and avian digestive systems, including roughages, concentrates, and supplements.

#### I. Plant Growth and Nutrients

1. Explain factors and processes in plant growth/
2. Understand the photosynthesis process and the roles of the sun, chlorophyll, sugar, carbon dioxide, and water in the process.
3. Understand the anatomy and functions of plant systems and structures.
4. Explain the respiration process in food and organic matter breakdown.
5. Describe annual, biennial, and perennial life cycles.
6. Explain plant sexual and asexual reproduction.

#### J. Plant and Insects and Pests

1. Understand the major classifications of pests.
2. Explain three conditions for pest problems.
3. Describe how pests affect plants and cause losses.
4. Explain the chemical, mechanical, cultural, and biological methods for plant pest control.
5. Explain the advantages and disadvantages of Integrated Pest Management (IPM).
6. List safety practices to follow in pest control.

#### K. Applying Animal Science Principles

1. Name and describe the major animal groups.
2. Describe the anatomy and physiology of animals.
3. Identify and explain the major organ systems of animals which include skeletal, nervous, circulatory, respiratory, excretory, digestive, reproductive and mammary.
4. Understand the evolution and roles of domesticated animals.
5. Explain the differences between domestication and natural selection.

#### L. Animal Feeds and Nutrition

1. Explain the feed needs of animals.
2. Describe the feedstuffs that provide nutrients.
3. Explain the characteristics of good feed.
4. Understand animal feeding guidelines and evaluate sample feeding programs for various species.
5. Describe the types of nutrients required by farm animals.
6. Analyze suitable common feed ingredients for ruminant, monogastric, equine, and avian digestive systems, including roughages, concentrates, and supplements.

#### M. Animal Genetics and Reproduction

1. Differentiate between genotype and phenotype, and describe how dominant and recessive genes function.
2. Compare and contrast genetic characteristics among different breeds of farm animals.
3. Demonstrate how to display phenotype and genotype ratios by utilizing a Punnett Square.
4. Explain the fertilization process and the methods of insemination.
5. Understand the purpose and processes of mitosis and meiosis.

#### N. Animal Health and Diseases

1. Explain common animal health practices.
2. Understand the causes and control of common diseases.
3. Describe environmental influences of animal health.
4. List and examine the different types of animal diseases.
5. Describe the different types of injections.

#### O. Using Biotechnology to Improve Life

1. Describe biotechnology and how it is being used.
2. Identify issues associated with Biotechnology.
3. Distinguish between two major areas of biotechnology
4. List and explain examples of organic biotechnology.
5. Describe the role of genetics, cells, and genomes in molecular biotechnology
6. Describe the process of genetic engineering and the use of recombinant DNA.
7. Identify the areas of Agriscience being developed through genetic engineering.

#### P. Applying Principles of Soil Science

1. Describe the major soil components and types.
2. Explain the different ways that soil can be formed.
3. Understand how soil texture, structure, pH, and salinity affect plant growth.
4. Explain the different kinds of soil.
5. Explain the types, uses, and applications of soil amendments and fertilizers.
6. Explain the relation between soil and land.

#### Q. Marketing Technology in Agriscience

1. Describe the importance of agricultural marketing.
2. Explain the ways agricultural products are marketed.
3. List and explain the major functions in agricultural marketing.
4. Describe the role of marketing infrastructure.
5. Explain the role of communication in agricultural marketing.

R. Computer Technology and Agriculture

1. Name five uses in agribusiness
2. Name and explain the functions of the major external parts of the computer.
3. Demonstrate the use of a word processor.
4. Gain access to information highway through the internet.

S. Interpersonal Skills & Leadership Development (FFA)

1. Explain leadership traits in a leader.
2. Chart a short history and purposes of the FFA
3. List and describe the FFA degree requirements.
4. Explain and recite the FFA Creed.
5. List components of teamwork and cooperation.
6. Goal setting and creating the positive attitude.
7. Completion of a Supervised Agricultural Experience Project.

T. Parliamentary Procedure & Law

1. Define Parliamentary Procedure.
2. Understand the basic concepts of Parliamentary Law.
3. Apply Parliamentary Law in a meeting setting.
4. Use effectively Parliamentary law within a meeting.

U. Communication and Speaking Skills

1. List and describe the importance of public speaking skills.
2. Demonstrate the ability to lead a group discussion.
3. Describe the importance of being a good listener.
4. Demonstrate public speaking skills in selecting, researching and orally delivering a 5-10 minute presentation.

V. Agriculture Science Research Project

1. Development of an agriculture science project.
2. Statistical management of project via Record Book.
3. Instructional coordination and supervision.
4. Analysis of project results.

W. Professional Opportunities in Agriculture

1. Biotechnology & research fields
2. Other related agriculture science fields.

**V. TEXTS & SUPPLEMENTAL INSTRUCTIONAL RESOURCES:**

Modern Biology 2 Edition (Holt, Rinehart & Winston, 2004)  
Laboratory Investigations in Biology (Holt, Rinehart & Winston, 2004)  
Agriculture Biology Lab Manual Revised (Fullerton, 1999)  
Biological Science Applications in Agriculture (Osborne, 1999)  
National FFA Organization (2004). Official Manual. Indianapolis, IN.  
California FFA Association (2004). California Agriculture Record Book,  
Sacramento, CA.  
University of California, Davis & California Department of Education (2002).

**VI. KEY ASSIGNMENTS:**

- A. Research Paper on Agriculture Science
- B. Seminar Presentation on Agriculture Science Practices
- C. Development of Science Fair Project relating to Agriculture Science
- D. Laboratory activities
- E. Supervised Agricultural Experience Project & Record Book
- F. FFA Leadership Participation

**VII. INSTRUCTIONAL METHODS:**

- A. Lecture
- B. Audio Visual Materials
- C. Research Readings and Written Presentation
- D. Homework Assignments
- E. Group & Individual Activities
- F. Laboratory Investigation – 1 per week (20% of grade)
- G. Discussion & Group Dynamics
- H. Quizzes, Tests & Final Exam
- I. Guest Speakers
- J. Field Trips
- K. Internet Exploration
- L. Seminar Presentation

**VIII. ASSESSMENT METHODS**

- |   |     |
|---|-----|
| A. Quizzes, Tests & Final Exam                              | 40% |
| B. Laboratory Investigation & Write-ups                     | 20% |
| C. Writing Assignments                                      | 10% |
| D. Leadership & Critical Thinking Activities                | 10% |
| E. Research Report and Seminar Presentation                 | 10% |
| F. Supervised Agricultural Experience Project & Record Book | 10% |

**IX. LABORATORY ACTIVITIES:**

- A. The following laboratory activities will be incorporated:
  - 1. The scientific method
  - 2. Using the microscope
  - 3. Using the dissecting microscope
  - 4. Introduction to lab exercises
  - 5. The effects of population shifts
  - 6. The effects of air pollution
  - 7. Water testing
  - 8. Root & stem anatomy
  - 9. Leaf anatomy
  - 10. Flower anatomy
  - 11. Pollution and fertilization
  - 12. Sexual & asexual reproduction
  - 13. Plant reactions to the environment



14. Soil testing
15. Soil erosion
16. Osmoses & diffusion investigation
17. Weed identification
18. Insect identification
19. Examination and diagram cells microscopically
20. Natural selection
21. Examine stained blood slides for form, function, parasites etc.
22. Simple digestion
23. Bacteria in Digestion
24. Parasites
25. Urinalysis – chemistry and morphology
26. Dilution and toxicity
27. Chemical mechanism of digestion
28. Chemistry analysis that identifies blood glucose levels
29. Chick embryo development
30. Normal system response
31. Fetal pig dissection
32. Effects of steroids on growth
33. Gene regulation
34. Manipulation of DNA
35. Genetic traits