

Agriculture Mechanics Class

Roland-Story High School

This class is based upon the study of mechanics as used within the Agricultural sectors. Units in this class focus on: (a) small gasoline engines, (b) electricity and wiring, (c) plumbing, (d) concrete, (e) hydraulics, and (f) machinery management.

In addition to learning about the concepts of agricultural mechanics, we will focus on various ‘soft skills’ that employers believe makes a difference in the workforce. Some of these are:

- a. communication skills *
- b. decision making
- c. problem solving
- d. proper etiquette *
- e. leadership
- f. promptness *
- g. responsible *
- h. work ethics *
- i. respectful *

85% of the success that most individuals and businesses have comes from the ability to utilize ‘soft skills’ as opposed to the ‘hard skills’ of technical knowledge.

Ag Mechanics Class Course Syllabus and Outline

Unit 1 – Small Gas Engines

- Explain the operation of small gas engines.
- Explain the function and operating principles of two-stroke and four-stroke gasoline engines
- Perform routine care, maintenance and perform tune-up of a small gasoline engine.
- Practice appropriate safety precautions.
- Solve minor small engine problems.
- Prepare a small engine for storage.

Days 1 – through 30

Day 1	Introduction to class – pre-test on small gas engines – in shop
Day 2	Review – toolboxes check out – check engines for oil and gas/try – drain oils
Day 3	review – engine repair fee sheet assignment
Day 4	Review – Operating engine principles reading/SG – notes and discussion
Day 5	Review – Labs 1 and 2
Day 6	Review – Review of labs 1 and 2 – quiz #1
Day 7	Review – Measurements – reading, study guide, notes, micrometers

Day 8	Review – Measuring exercise
Day 9	Review – Labs 3 and 4
Day 10	Review – Displacement and horsepower lesson (reading/worksheet)
Day 11	Review – Lab 5
Day 12	Review – Finish lab 5
Day 13	Review – Lab 6
Day 14	Review – Lab 7
Day 15	Review – Measurement lab exercise
Day 16	Review – finish measurement lab exercise and lab 8
Day 17	Review – Labs 9 and 10
Day 18	Review – Lab 11
Day 19	Review – Carburetion reading, study guide, notes and discussion
Day 20	Review – Lab 12
Day 21	Review – Lab 13
Day 22	Review – Lab 14
Day 23	Review – Lab 15 (oil races)
Day 24	Review – begin lab 16
Day 25	Review – work on lab 16
Day 26	Review – work on lab 16
Day 27	Review – finish lab 16
Day 28	Review – Begin electronic presentation construction assignment.
Day 29	Review – Finish with Electronic presentation construction assignment
Day 30	Unit Test

Unit 2 – Electricity and Wiring

- List advantages of electric power.
- Discuss the types of electric wiring diagrams.
- List factors to consider when selecting electric components.
- Select and maintain electric controls.
- Wire simple electrical connections

Day 31	Introduction to electricity and wiring unit – pre-test – lab 1 (cut/strip wire)
Day 32	Review – lesson on watts/volts/amps –
Day 33	Review – Lab 2 (soldering wire, wire nuts, taping)
Day 34	Review – Field trip
Day 35	Review – Quiz – Lab 3 (make power cord)
Day 36	Review – Lab 4 (outlet) Lab 5 (light)
Day 37	Review – Lab 6 (switch to outlet)
Day 38	Review – Lab 7 (switch to light)
Day 39	Review – Lab 8 (junction box and switch/outlet or light)
Day 40	Review – Lab 9 (junction box with multiple outlets)
Day 41	Review – Lab 10 (3 way switch version 1)
Day 42	Review – Lab 11 (3 way switch version 2)
Day 43	Review – Lab 12 (3 way switch version 3)
Day 44	Review – catch up day
Day 45	Review – Unit test

Unit 3 – Plumbing

- Identify tools used for plumbing work.
- Identify and select pipe.
- Identify common pipe fittings.
- Assemble pipe.
- Maintain water systems.

Day 46	Introduction to plumbing, reading and study guide, notes
Day 47	Review, unit 35 crossword puzzle, finish notes
Day 48	Review, presentation assignment work
Day 49	Review, finish with presentation assignment, make presentations
Day 50	Review – Lab #1
Day 51	Review – Lab #2
Day 52	Review – Lab #3
Day 53	Review – Test project
Day 54	Review – End of Unit test

Unit 4 – Concrete

- Identify tools used for concrete work.
- Select ingredients for mixing concrete.
- Make a workable masonry mix.
- Prepare forms for concreting.
- Pour concrete.
- Finish concrete.
- Calculate concrete and block for a job.

Day 55	Introduction to unit, reading (unit 38) and study guide, notes
Day 56	Review -- video and sheet, presentation assignment
Day 57	Review -- finish with presentation assignment
Day 58	Review -- finish presentations, Labs 1 and 2
Day 59	Review -- labs 3 and 4
Day 60	Review -- labs 3 and 4
Day 61	Review – Lab 5
Day 62	Review – Unit test

Unit 5 – Hydraulics

- Explain the operational theory of hydraulics.
- Explain the properties of fluids.
- List the major components of a hydraulic system.
- List applications of hydraulics.

Day 63	Introduction to fluid mechanics – Lesson 1 materials from packet
Day 64	Review – lesson 2 materials from packet
Day 65	Review – lesson 3 materials from packet
Day 66	Review – lesson 4 materials from packet
Day 67	Review – lesson 5 materials from packet
Day 68	Review – lesson 6 materials from packet
Day 69	Review – lesson 7 materials from packet
Day 70	Review – lesson 8 materials from packet
Day 71	Review – lesson 9 materials from packet
Day 72	Review – lesson 10 materials from packet
Day 73	Review -- lesson 11 materials from packet
Day 74	Review -- lesson 12 materials from packet
Day 75	Review -- lesson 13 materials from packet
Day 76	Review – Unit Test/evaluation

Unit 6 – Machinery Management

- Explain how to select machinery.
- Describe legal land descriptions.
- Estimate machine capacity.
- Determine field efficiency.
- Calculate power requirements.
- Estimate machinery costs such as fixed and variable.

Day 77	Introduction to machinery management – pre-test – field trip
Day 78	Review – reading/study guide – notes -- discussion
Day 79	Review – lesson on machinery capacities
Day 80	Review – Lesson on field capacities
Day 81	Review – Lesson on Matching Machine size and capacity
Day 82	Review – Lesson on Estimating Power Requirements
Day 83	Review – Lesson on Legal land descriptions
Day 84	Review – Purchasing agent project assignment
Day 85	Review – finalize purchasing agent assignment

Grading of Class

Grading is based on quality of work done in a timely fashion.

97% and above = A+

93 to 97% = A

90 to 92% = A-

87 to 90% = B+

83 to 87% = B

80 to 83% = B-

77 to 80% = C+

73 to 77% = C

70 to 73% = C-

67 to 70% = D+

63 to 67% = D

60 to 63% = D-

< 60% = F

Graded Items include: daily work, class participation, quizzes, labs, tests, reports, projects, educational trip activities, reflective statements, etc.

Unit assignments include:

- Reading and study guides
- Vocabulary exercises – crossword puzzles, flash cards, bingo
- Presentations – evaluation of presentation skills and subject matter
- Research
- Design of projects
- Educational trips
- Guest Speakers
- Quizzes and tests