

VoCats

Course Blueprints

Agricultural Education

6833 Agricultural Mechanics II - Small Engines

Public Schools of North Carolina
State Board of Education • Department of Public Instruction
Curriculum and School Reform Services
Division of Instructional Services

Raleigh, North Carolina
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Special thanks to the following faculty, educators and business people who reviewed and approved this blueprint for technical content and appropriateness for the industry:

Mr. Kevin Beam, Fred T. Foard High School
Mr. Tim Blair, Piedmont High School
Mr. Dixon Britt, Purnell Swett High School
Mr. Lane Dickens, Millbrook High School
Mr. Kevin Franklin, Enka High School
Mr. Mark London, South Iredell High School
Ms. David Overcash, South Rowan High School
Mr. Tom Sawyer, East Carteret High School
Mr. Don White, Gates County Senior High School

This blueprint has been review by business and industry representatives for technical content and appropriateness for the industry. Contact Benjie Forrest, North Carolina State University, Vernon James Research and Extension Center at 252-793-4428 ext. 130 for more information or benjie_forrest@ncsu.edu.

VoCATS Course Blueprint

A course blueprint is a document laying out the framework of the curriculum for a given course. Shown on the blueprint are the units of instruction, the core competencies in each unit, and the specific objectives for each competency. The blueprint illustrates the recommended sequence of units and competencies and the cognitive and performance weight or relative importance of the objective within the course.

The blueprint is intended to be used by teachers in planning the course of work for the year preparing daily lesson plans, and constructing instructionally valid assessments.

For additional information about this blueprint, contact program area staff. For additional information about VoCATS, contact program area staff or Vocats, Career-Technical Education, Division of Instructional Services, North Carolina Department of Public Instruction, 6358 Mail Service Center, Raleigh, North Carolina 27699-5358, 919|807-3876, email: rwelfare@dpi.state.nc.us.

Interpretation of Columns on VoCATS Course Blueprints

No.	Heading	Column information
1	Comp# Obj.#	Comp=Competency number (three digits); Obj.=Objective number (competency number plus two-digit objective number).
2	Unit Titles/Competency and Objective Statements	Statements of unit titles, competencies per unit, and specific objectives per competency. Each competency statement or specific objective begins with an action verb and makes a complete sentence when combined with the stem "The student will be able to. . ." (The stem appears once in Column 2.) Outcome behavior in each competency/objective statement is denoted by the verb plus its object.
3	Time Hrs	Space for teachers to calculate time to be spent on each objective based on their individual school schedule and the students' performance on preassessments.
4	COURSE % Cognitive	A percentage indicates the relative importance or weight of each unit within the total course or program, each competency within the total course or program, or each objective within the total course or program. Information in Column 5 is used to plan the yearly calendar of work and as a Test Blueprint for preassessments and post assessments.
5	COURSE % Perform	A percentage indicates the relative importance or weight of each competency within a specific unit or each objective within a specific unit. Information in Column 4 is used to plan the yearly calendar of work and as a Test Blueprint for interim assessments.
6	Type Behavior	Classification of outcome behavior in competency and objective statements. (C=Cognitive; P=Psychomotor; A=Affective)
7	Integrated Skill Area	Integrate Skills codes: A=Arts; C=Communications; H=Health/Safety; M=Math; SC=Science; SS=Social Studies.
8	Core Supp	Designation of the competencies and objectives as Core or Supplemental. Competencies and objectives designated Core must be included in the yearly calendar of work.

AGRICULTURAL EDUCATION
COURSE BLUEPRINT for 6833 AGRICULTURAL MECHANICS II – SMALL ENGINES
(Recommended Hours of Instruction: 135 – 180)

Comp# Obj #	Unit Titles/Competency and Objective Statements (The Student will be able to:)	Time/ Hours	Course Weight		Type Behavior	Integrated Skill Area	Core Supp.
			Cognitive	Performance			
1	2	3	4	5	6	7	8
			100%				
	Total Course Weight		69%	31%			
A.	LEADERSHIP DEVELOPMENT		6%	3%			
SE01.00	Demonstrate the major components of leadership involved in successful employment.		2%	1%	C3	C	Core
<i>SE01.01</i>	<i>Identify leadership qualities desired by the small engines industry.</i>		<i>2%</i>		<i>C1</i>	<i>C</i>	<i>Core</i>
<i>SE01.02</i>	<i>Develop leadership qualities through participation in the small engines instructional program.</i>			<i>1%</i>	<i>C3P</i>	<i>C</i>	<i>Core</i>
SE02.00	Apply <u>Robert's Rules of Order</u> to conduct business meetings needed by agricultural organizations.		2%	1%	C3P	C/SS	Core
<i>SE02.01</i>	<i>Analyze the role that <u>Robert's Rules of Order</u> plays in the orderly conduct of business.</i>		<i>2%</i>		<i>C3</i>	<i>C/SS</i>	<i>Core</i>
<i>SE02.02</i>	<i>Conduct the transaction of business using <u>Robert's Rules of Order</u>.</i>			<i>1%</i>	<i>C3P</i>	<i>C/SS</i>	<i>Core</i>
SE03.00	Adapt public speaking techniques to the audience and to the purpose of the communication taking place.		2%	1%	C3P	C	Core
<i>SE03.01</i>	<i>Discuss the major types of speeches and the variables to be considered when presenting the speeches.</i>		<i>2%</i>		<i>C2</i>	<i>C</i>	<i>Core</i>
<i>SE03.02</i>	<i>Deliver a speech to a small engines industry organization.</i>			<i>1%</i>	<i>C3P</i>	<i>C</i>	<i>Core</i>
<i>SE03.03</i>	<i>Identify various components of the techniques involved in agricultural sales.</i>				<i>C1</i>	<i>C</i>	<i>Supp</i>
<i>SE03.04</i>	<i>Demonstrate sales techniques with a 7-minute sales presentation on small engines products or services.</i>				<i>C3P</i>	<i>C</i>	<i>Supp</i>

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			Cognitive	Performance			
1	2	3	4	5	6	7	8
B	SUPERVISED AGRICULTURAL EXPERIENCE PROGRAM		4%	3%			
SE04.00	Design an individual written school-to-work employment plan based upon career objectives.		2%	1%	C3P	C	Core
<i>SE04.01</i>	<i>Describe the procedures to follow in planning and implementing a school-to-work employment plan.</i>		<i>2%</i>		<i>C1</i>	<i>C</i>	<i>Core</i>
<i>SE04.02</i>	<i>Create an individual written school-to-work employment plan based upon career objectives.</i>			<i>1%</i>	<i>C3P</i>	<i>C/M</i>	<i>Core</i>
SE05.00	Develop a financial record system for use in the small engines industry.		2%	2%	C3P	C/M	Core
<i>SE05.01</i>	<i>Describe the elements in a financial statement.</i>		<i>2%</i>		<i>C1</i>	<i>C/M</i>	<i>Core</i>
<i>SE05.02</i>	<i>Compose a financial statement.</i>			<i>2%</i>	<i>C3P</i>	<i>C/M</i>	<i>Core</i>
C.	WORKPLACE SAFETY		4%	1%			
SE06.00	Interpret shop management safety factors.		2%		C2	C/H	Core
<i>SE06.01</i>	<i>Discuss potential shop hazards.</i>		<i>1%</i>		<i>C2</i>	<i>C/H</i>	<i>Core</i>
<i>SE06.02</i>	<i>Explain how to react to shop emergencies.</i>		<i>1%</i>		<i>C2</i>	<i>C/H</i>	<i>Core</i>
SE07.00	Practice proper personal procedures.		2%	1%	C3P	C/H	Core
<i>SE07.01</i>	<i>Explain the importance of shop safety.</i>		<i>2%</i>		<i>C2</i>	<i>C/H</i>	<i>Core</i>
<i>SE07.02</i>	<i>Use tools and equipment safely.</i>			<i>1%</i>	<i>C3P</i>	<i>C/H</i>	<i>Core</i>
D.	SMALL ENGINE TOOLS AND MATERIALS		5%	1%			
SE08.00	Demonstrate the use of small engine tools.				C3P	C/H/SC	Core
<i>SE08.01</i>	<i>Describe small engine hand tools and measuring instruments.</i>		<i>1%</i>		<i>C1</i>	<i>C/H/SC</i>	<i>Core</i>
<i>SE08.02</i>	<i>Demonstrate the use of small engine hand tools and measuring instruments.</i>			<i>1%</i>	<i>C3P</i>	<i>C/H/SC</i>	<i>Core</i>
SE09.00	Describe the use of common small engine fasteners, adhesives and gaskets		4%		C1	C/M/SC	Core
<i>SE09.01</i>	<i>Identify common small engine fasteners, adhesives and gaskets.</i>		<i>1%</i>		<i>C1</i>	<i>C</i>	<i>Core</i>
<i>SE09.02</i>	<i>Describe the uses of common small engine fasteners, adhesives, sealants, and gaskets.</i>		<i>2%</i>		<i>C1</i>	<i>C/M/SC</i>	<i>Core</i>
<i>SE09.03</i>	<i>Describe important concepts of thread types and threading as it relates to small engines.</i>		<i>1%</i>		<i>C1</i>	<i>C/M</i>	<i>Core</i>

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			Cognitive	Performance			
1	2	3	4	5	6	7	8
E.	SMALL ENGINE CONSTRUCTION, PRINCIPLES, AND THEORIES		9%				
SE10.00	Explain basic small engine operating principles.		4%		C2	C/SC	Core
<i>SE10.01</i>	<i>Discuss the purposes of the major components of a small engine.</i>		<i>2%</i>		<i>C2</i>	<i>SC</i>	<i>Core</i>
<i>SE10.02</i>	<i>Explain the principles of fuel combustion in relation to small engine operation.</i>		<i>2%</i>		<i>C2</i>	<i>C/SC</i>	<i>Core</i>
SE11.00	Explain the theories of small engine operation.		5%		C2	C/SC	Core
<i>SE11.01</i>	<i>Define terms related to small engine theory, performance, and operation.</i>		<i>2%</i>		<i>C1</i>	<i>C/M/SC</i>	<i>Core</i>
<i>SE11.02</i>	<i>Explain what takes place during each stroke of four-stroke and two-stroke engines.</i>		<i>2%</i>		<i>C2</i>	<i>C/SC</i>	<i>Core</i>
<i>SE11.03</i>	<i>Discuss how horsepower is determined.</i>		<i>1%</i>		<i>C2</i>	<i>C/M/SC</i>	<i>Core</i>
F.	SMALL ENGINE FUEL EMISSION CONTROL AND CARBURATION		9%				
SE12.00	Discuss common engine fuel systems and their uses.		4%		C2	C/SC	Core
<i>SE12.01</i>	<i>Summarize types and applications of fuels and mixtures.</i>		<i>1%</i>		<i>C2</i>	<i>C/SC</i>	<i>Core</i>
<i>SE12.02</i>	<i>Describe the types, operation, and maintenance of common fuel delivery systems.</i>		<i>3%</i>		<i>C1</i>	<i>C/SC</i>	<i>Core</i>
<i>SE12.03</i>	<i>Discuss emission control related agencies and regulations.</i>				<i>C2</i>	<i>C/H/SC/SS</i>	<i>Supp</i>
SE13.00	Demonstrate knowledge of carburetors and their operation.		5%		C3P	C/SC	Core
<i>SE13.01</i>	<i>Explain the principles and operation of carburetors.</i>		<i>2%</i>		<i>C2</i>	<i>C/SC</i>	<i>Core</i>
<i>SE13.02</i>	<i>Summarize common carburetor systems and their parts.</i>		<i>3%</i>		<i>C2</i>	<i>C</i>	<i>Core</i>

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			Cognitive	Performance			
1	2	3	4	5	6	7	8
G.	SMALL ENGINE IGNITION SYSTEMS		14%	1%			
SE14.00	Explain the concepts of small engine ignition systems.		5%		C2	C/M/SC	Core
<i>SE14.01</i>	<i>Describe the operation of a basic ignition system.</i>		<i>1%</i>		<i>C1</i>	<i>C/SC</i>	<i>Core</i>
<i>SE14.02</i>	<i>Explain the fundamental electrical principles and measurement.</i>		<i>2%</i>		<i>C2</i>	<i>C/SC</i>	<i>Core</i>
<i>SE14.03</i>	<i>Discuss spark plugs and their uses.</i>		<i>2%</i>		<i>C2</i>	<i>C/M/SC</i>	<i>Core</i>
SE15.00	Analyze the operation of small engine magneto ignition systems.		5%	1%	C3P	C/SC	Core
<i>SE15.01</i>	<i>Explain the principles and operation of magneto systems.</i>		<i>5%</i>		<i>C2</i>	<i>C/SC</i>	<i>Core</i>
<i>SE15.02</i>	<i>Compare the three magneto ignition systems.</i>			<i>1%</i>	<i>C3P</i>	<i>C/SC</i>	<i>Core</i>
SE16.00	Analyze the operation of battery ignition systems.		4%		C3	C/SC	Core
<i>SE16.01</i>	<i>Explain the principles and functions of battery ignition systems.</i>		<i>3%</i>		<i>C2</i>	<i>C/SC</i>	<i>Core</i>
<i>SE16.02</i>	<i>Compare magneto ignition systems and battery ignition systems.</i>		<i>1%</i>		<i>C3</i>	<i>C/SC</i>	<i>Core</i>
H.	SMALL ENGINES LUBRICATION SYSTEMS		6%	2%			
SE17.00	Describe general concepts of oils and lubrication in small engines.		3%		C1	C/SC	Core
<i>SE17.01</i>	<i>Recognize the purposes, properties, and importance of oil to small engines.</i>		<i>2%</i>		<i>C1</i>	<i>C/SC</i>	<i>Core</i>
<i>SE17.02</i>	<i>Define oil viscosity information and terms.</i>		<i>1%</i>		<i>C1</i>	<i>C</i>	<i>Core</i>
SE18.00	Demonstrate the general concepts of small engine lubrication.		3%	2%	C3P	C/M/S	Core
<i>SE18.01</i>	<i>Explain the importance of a proper gas:oil mixture in 2-cycle engines.</i>		<i>1%</i>		<i>C2</i>	<i>C/SC</i>	<i>Core</i>
<i>SE18.02</i>	<i>Describe the common lubrication systems for a 4-cycle small engine.</i>		<i>2%</i>		<i>C1</i>	<i>C/SC</i>	<i>Core</i>
<i>SE18.03</i>	<i>Mix an appropriate gas:oil mixture for a given 2-cycle engine.</i>			<i>2%</i>	<i>C3P</i>	<i>C/M/SC</i>	<i>Core</i>
I.	SMALL ENGINE COOLING SYSTEMS		5%				
SE19.00	Demonstrate an understanding of small engine cooling concepts.		2%		C3	C/SC	Core
<i>SE19.01</i>	<i>Explain the importance of properly cooling a small engine.</i>		<i>1%</i>		<i>C3</i>	<i>C/SC</i>	<i>Core</i>
<i>SE19.02</i>	<i>Compare the various methods of cooling small engines.</i>		<i>1%</i>		<i>C3</i>	<i>C/SC</i>	<i>Core</i>

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1	2	3	4	5	6	7	8
SE20.00	Explain the operation of cooling system components.		3%		C2	C/SC	Core
<i>SE20.01</i>	<i>Describe the types of water pumps found in small engines.</i>		<i>1%</i>		<i>C1</i>	<i>C/SC</i>	<i>Core</i>
<i>SE20.02</i>	<i>Explain the operation of a thermostat.</i>		<i>1%</i>		<i>C2</i>	<i>C/SC</i>	<i>Core</i>
<i>SE20.03</i>	<i>Describe a radiator and its operation.</i>		<i>1%</i>		<i>C1</i>	<i>C/SC</i>	<i>Core</i>
J.	SMALL ENGINE PREVENTIVE MAINTENANCE AND TROUBLESHOOTING		3%	8%			
SE21.00	Perform general preventative maintenance on a small engine.			5%	C3P	C/SC	Core
<i>SE21.01</i>	<i>Service air-cooled small engines..</i>			<i>4%</i>	<i>C3P</i>	<i>C</i>	<i>Core</i>
<i>SE21.02</i>	<i>Service a water-cooled small engine cooling system.</i>			<i>1%</i>	<i>C3P</i>	<i>C</i>	<i>Core</i>
SE22.00	Troubleshoot a small engine.		3%	3%	C3P	C/M/SC	Core
<i>SE22.01</i>	<i>Explain the terms and rationale behind small engine troubleshooting.</i>		<i>3%</i>		<i>C2</i>	<i>C/M/SC</i>	<i>Core</i>
<i>SE22.02</i>	<i>Demonstrate small engine troubleshooting techniques according to service manuals.</i>			<i>3%</i>	<i>C3P</i>	<i>C/M/SC</i>	<i>Core</i>
K.	SERVICING SMALL ENGINE SYSTEMS		2%	12%			
SE23.00	Service a small engine fuel system.			3%	C3P	C/SC	Core
<i>SE23.01</i>	<i>Troubleshoot a small engine fuel system.</i>			<i>1%</i>	<i>C3P</i>	<i>C/SC</i>	<i>Core</i>
<i>SE23.02</i>	<i>Repair the components of a small engine fuel system</i>			<i>2%</i>	<i>C3P</i>	<i>C/SC</i>	<i>Core</i>
SE24.00	Service a small engine ignition system.			4%	C3P	C/SC	Core
<i>SE24.01</i>	<i>Test a small engine ignition system.</i>			<i>2%</i>	<i>C3P</i>	<i>C/M/SC</i>	<i>Core</i>
<i>SE24.02</i>	<i>Maintain a small engine ignition system.</i>			<i>2%</i>	<i>C3P</i>	<i>C/SC</i>	<i>Core</i>
<i>SE24.03</i>	<i>Test and service batteries.</i>				<i>C3P</i>	<i>C/SC</i>	<i>Supp</i>
SE25.00	Service a small engine block assembly.		2%	5%	C3P	M/SC	Core
<i>SE25.01</i>	<i>Explain small engine block assembly terms.</i>		<i>2%</i>		<i>C2</i>	<i>M/SC</i>	<i>Core</i>
<i>SE25.02</i>	<i>Inspect a block assembly and related components.</i>			<i>3%</i>	<i>C3P</i>	<i>M/SC</i>	<i>Core</i>
<i>SE25.03</i>	<i>Service a block assembly and related components.</i>			<i>2%</i>	<i>C3P</i>	<i>M/SC</i>	<i>Core</i>

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1	2	3	4	5	6	7	8
SE26.00	Service a small engine electrical system.				C3P	SC	Supp
SE26.01	Check dc starter/generator circuits.				C3P	SC	Supp
SE26.02	Maintain alternator charging system and related parts.				C3P	SC	Supp
SE26.03	Troubleshoot an alternator charging system.				C3P	SC	Supp
L.	SERVICING SMALL ENGINE POWERED EQUIPMENT		2%				
SE27.00	Demonstrate safe work habits and procedures when working with power equipment.		2%		C3P	C/H	Core/ Supp
SE27.01	Describe basic safe work procedures specific to power equipment.		2%		C1	C/H	Core
SE27.02	Demonstrate basic safe work procedures specific to power equipment.				C3P	C/H	Supp
SE28.00	Perform basic operation and maintenance on a lawn mower				C3P	C	Supp
SE28.01	Identify parts of commonly used lawn mowers.				C1	C	Supp
SE28.02	Suggest a mower and accessories for a given situation.				C3P	C	Supp
SE28.03	Demonstrate proper use of common lawn mower starting systems.				C3P	C	Supp
SE28.04	Sharpen a lawn mower blade.				C3P	C	Supp
SE28.05	Discuss storage procedures for a lawn mower.				C2	C	Supp
SE28.06	Demonstrate safe handling of a lawn mower.				C3P	C	Supp
SE29.00	Perform basic operations and maintenance on a chain saw.				C3P	C/H	Supp
SE29.01	Discuss purchasing considerations for a chain saw.				C1	C	Supp
SE29.02	Demonstrate safe handling of a chain saw.				C3P	C/H	Supp
SE29.03	Demonstrate chain saw troubleshooting.				C3P	C	Supp
SE29.04	Demonstrate chain saw maintenance.				C3P	C	Supp
SE30.00	Perform basic operations and maintenance on a string trimmer				C3P	C	Supp
SE30.01	Discuss purchasing considerations for a string trimmer.				C1	C	Supp
SE30.02	Demonstrate safe handling of a string trimmer.				C3P	C	Supp
SE30.03	Demonstrate string trimmer maintenance.				C3P	C	Supp