

VoCATS

Course Blueprints

Technology Education

8115 Manufacturing Systems

*Public Schools of North Carolina
State Board of Education • Department of Public Instruction
Office of Instructional and Accountability Services
Division of Instructional Services*

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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 weight or relative importance of the objective within the course or unit.

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 the VoCATS Competency Achievement Tracking System, contact program area staff or VoCATS, Workforce Development, Division of Instructional Services, North Carolina Department of Public Instruction, 301 North Wilmington Street, Raleigh, North Carolina 27601-2825, 919/715-1674, 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 for cognitive learning of each objective within the total course. Information in Column 4 is used to plan the yearly calendar of work and as a test blueprint for assessments and postassessments. Column 4 plus Column 5 equals 100 percent..
5	Course % Perform	A percentage indicates the relative importance or weight for applied (performance) learning of each objective within a course. Information in Column 5 is used to plan the yearly calendar of work. Column 4 plus Column 5 equals 100 percent.
6	Type Behavior	Classification of outcome behavior in competency and objective statements. (C=Cognitive; P=Psychomotor; A=Affective)
7	Integrated Skill Area	Integrated 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.

Activities and procedures within Workforce Development are governed by the philosophy of simple fairness to all. Therefore, the policy of Workforce Development is that all operations will be performed without regard to race, sex, color, national origin or handicap.

TECHNOLOGY EDUCATION
 COURSE BLUEPRINT for **8115 MANUFACTURING SYSTEMS**
 [Recommended hours of instruction: 135-180]

Comp# Obj.#	Unit Titles/Competency and Objective Statements (The student will be able to:)	Time Hrs.	Course% Cognitive	Course % Perform	Type Behavior	Integrated Skill Area	Core Supp.
1	2	3	4	5	6	7	8
A.	INTRODUCTION		5%				
001.	Assess the role and importance of manufacturing systems.		3%		C3	SS	Core
001.01	<i>Explain the importance of manufacturing to society.</i>		1%		C1	SS	Core
001.02	<i>Evaluate the Universal Systems Model relative to manufacturing.</i>		1%		C3	SS	Core
001.03	<i>Compare and contrast types of manufacturing systems.</i>		1%		C3	SS	Core
002.	Participate as an individual or group member to plan, organize, and carry out activities and projects.		2%		C3	C H	Core
002.01	<i>Apply teamwork and communication concepts.</i>		1%		C3	C	Core
002.02	<i>Apply safety concepts relative to a manufacturing environment.</i>		1%		C3	H	Core
B.	HISTORICAL DEVELOPMENTS, FUTURE TRENDS, AND CAREER OPPORTUNITIES IN MANUFACTURING		7%	2%			
003.	Analyze historical developments in manufacturing systems.		3%		C3P	C SC SS	Core
003.01	<i>Trace major developments in the evolution of manufacturing.</i>		2%		C2	SC SS	Core
003.02	<i>Explain the impact of foundational technical developments in manufacturing.</i>		1%		C3P	C SS	Core
004.	Analyze contemporary trends of manufacturing systems.		4%	2%	C3P	C SS	Core
004.01	<i>Describe current trends in manufacturing management and technology.</i>		2%		C1	SS	Core
004.02	<i>Explain technical trends affecting manufacturing systems.</i>		1%	1%	C3P	C	Core
004.03	<i>Assess occupations in manufacturing.</i>		1%	1%	C3P	C SS	Core
C.	DATA COLLECTION AND EVALUATION		6%	6%			
005.	Collect and interpret data.		3%	4%	C3P	M SC	Core
005.01	<i>Measure using standard and precision measuring instruments.</i>		2%	2%	C2P	M	Core
005.02	<i>Use sensors for data collection.</i>		1%	2%	C3P	M SC	Core
006.	Apply statistics to monitor and control manufacturing processes.		3%	2%	C3P	M	Core
006.01	<i>Make observations, create and interpret graphs and charts.</i>		2%	1%	C3	M	Core
006.02	<i>Apply statistical process control to improve a manufacturing process.</i>		1%	1%	C3P	M	Core
D.	TOOLING DESIGN, MACHINES, AND AUTOMATION IN MANUFACTURING		4%	10%			
007.	Operate cutting, forming, and assembly tools and machines to process materials.			6%	C3P	M SC	Core

Comp# Obj.#	Unit Titles/Competency and Objective Statements (The student will be able to:)	Time Hrs.	Course% Cognitive	Course % Perform	Type Behavior	Integrated Skill Area	Core Supp.
007.01	Use hand tools and machines to process materials.			1%	C3P	M SC	Core
007.02	Apply principles of circuit logic to control a manufacturing process.			1%	C3P	M SC	Core
007.03	Program and operate computer controlled production devices.			1%	C3P	M SC	Core
007.04	Program and operate computer controlled material handling devices.			1%	C3P	M SC	Core
007.05	Apply principles of fluid power to manufacturing processes.			1%	C3P	SC	Core
007.06	Apply principles of mechanics to manufacturing processes.			1%	C3P	SC	Core
008.	Design tooling to improve manufacturing processes.		4%	4%	C3P	C H SC	Core
008.01	Design a tooling jig or fixture to use in material processing.		1%	2%	C3P	C SC	Core
008.02	Design a measurement gauge to improve efficiency and quality of a manufacturing process.		1%	2%	C3P	C SC	Core
008.03	Apply machine safeguarding systems.		2%		C3	H	Core
E.	DESIGN AND PROBLEM SOLVING IN PRODUCT DEVELOPMENT		9%	18%			
009.	Assess and apply problem solving methods to the solution of technological problems.		5%	6%	C3P	A SC	Core
009.01	Select appropriate problem solving and design methods for developing solutions to manufacturing problems.		2%		C2	A SC	Core
009.02	Apply a problem solving method to the solution of technological problems.		2%	1%	C2P	SC	Core
009.03	Construct a model to test a proposed solution.		1%	5%	C3P	SC	Core
010.	Develop a product for production.		4%	12%	C3P	C H M SC SS	Core
010.01	Prototype a proposed manufacturing product.		1%	5%	C3P	C	Core
010.02	Conduct a manufacturing cost and feasibility study		1%	1%	C3P	M	Core
010.03	Conduct a market survey		1%	2%	C3P	M SS	Core
010.04	Evaluate a product design on consumer liability factors and environmental impact.		1%	1%	C3P	H SS	Core
010.05	Finalize a product design.			3%	C3P	SC	Core
F.	PROCESS ORGANIZATION AND PRODUCTION PLANNING		9%	24%			
011.	Develop a manufacturing process and plant layout to produce a product.		4%	5%	C3P	SC SS	Core
011.01	Identify process methods and process layouts.		1%		C2	SC	Core
011.02	Plan the sequence of operations needed to fabricate and assemble a product.		1%	1%	C3P	SC	Core
011.03	Design and evaluate a work station and its setup.		1%	2%	C3P	SC SS	Core
011.04	Design, implement & evaluate a plant layout.		1%	2%	C3P	SS	Core
012.	Start-up a production process.		3%	5%	C3P	H M SC	
012.01	Organize personnel to perform the tasks necessary to operate a manufacturing system.		1%	1%	C3P	SC	Core
012.02	Organize a plant safety system to insure safe working conditions.		1%	2%	C3P	H	Core

Comp# Obj.#	Unit Titles/Competency and Objective Statements (The student will be able to:)	Time Hrs.	Course% Cognitive	Course % Perform	Type Behavior	Integrated Skill Area	Core Supp.
012.03	<i>Conduct and evaluate a pilot run to debug the manufacturing system.</i>		1%	2%	C3P	M	Core
013.	Evaluate and improve a manufacturing system.		2%	14%	C3P	M SC	Core
013.01	<i>Develop a production schedule.</i>			3%	C3P	M SS	Core
013.02	<i>Produce a manufactured product.</i>			5%	C3P	SC	Core
013.03	<i>Implement quality control system to monitor and improve product quality.</i>		1%	3%	C3P	M	Core
013.04	<i>Analyze and improve a manufacturing process.</i>		1%	3%	C3P	M	Core
	Course Totals		40%	60%			