2013/2014 Student Competency Record
Technology of Robotic Design
8421 (co-op not available) - 36 weeks

Student	**School Year**
School	**Teacher Signature**

Traditional letter or numerical grades do not provide adequate documentation of student achievement in competency-based education; therefore, the Virginia Standards for CBE require a recording system to provide information about competencies achieved to employer, student-employee, and teacher. The Student Competency Record provides a means for keeping track of student progress. Ratings are assigned by the teacher for classroom competency achievement and by the teacher-coordinator in conjunction with the training sponsor when competence is evaluated on the job.

Tasks/competencies designated "Required" are considered essential statewide and are required of all students. In some courses, all tasks/competencies have been identified as required. Tasks/competencies marked "Optional" are considered optional; they and/or additional tasks/competencies may be taught at the discretion of the school division. Tasks/competencies marked with an asterisk (*) are considered sensitive, and teachers should obtain approval by the school division before teaching them.

Note: Students with an Individualized Education Plan (IEP) or an Individualized Student Alternative Education Plan (ISAEP) will be rated, using the following scale, only on the competencies identified in their IEP or ISAEP.

Students will be expected to achieve a **satisfactory rating** (one of the three highest marks) on the Student Competency Record (SCR) rating scale on at least 80% of the required (essential) competencies in a CTE course.

...RATING SCALE...
1 - Can teach others
2 - Can perform without supervision
3 - Can perform with limited supervision
4 - Can perform with supervision
5 - Cannot perform

8421 (co-	Technology of Robotic Design	Date	Rating

op not available) 36 weeks	TASKS/COMPETENCIES			
	Demonstrating Workplace Readiness Skills: Personal Qualities and People Skills			
Required	1	Demonstrate positive work ethic.		
Required	2	Demonstrate integrity.		
Required	3	Demonstrate teamwork skills.		
Required	4	Demonstrate self-representation skills.		
Required	5	Demonstrate diversity awareness.		
Required	6	Demonstrate conflict-resolution skills.		
Required	7	Demonstrate creativity and resourcefulness.		
	Demonstrating Workplace Readiness Skills: Professional Knowledge and Skills			
Required	8	Demonstrate effective speaking and listening skills.		
Required	9	Demonstrate effective reading and writing skills.		
Required	10	Demonstrate critical-thinking and problem-solving skills.		
Required	11	Demonstrate healthy behaviors and safety skills.		
Required	12	Demonstrate an understanding of workplace organizations, systems, and climates.		
Required	13	Demonstrate lifelong-learning skills.		
Required	14	Demonstrate job-acquisition and advancement skills.		
Required	15	Demonstrate time-, task-, and resource-management skills.		
Required	16	Demonstrate job-specific mathematics skills.		
Required	17	Demonstrate customer-service skills.		
	Demonstrating Workplace Readiness Skills: Technology Knowledge and Skills			
Required	18	Demonstrate proficiency with technologies common to a specific occupation.		
Required	19	Demonstrate information technology skills.		
Required	20	Demonstrate an understanding of Internet use and security issues.		
Required	21	Demonstrate telecommunications skills.		
	Examining All Aspects of an Industry			
Required	22	Examine aspects of planning within an industry/organization.		
Required	23	Examine aspects of management within an industry/organization.		
Required	24	Examine aspects of financial responsibility within an industry/organization.		
Required	25	Examine technical and production skills required of workers		

		within an industry/organization.		
Required	26	Examine principles of technology that underlie an industry/organization.		
Required	27	Examine labor issues related to an industry/organization.		
Required	28	Examine community issues related to an industry/organization.		
Required	29	Examine health, safety, and environmental issues related to an industry/organization.		
	Addressing Elements of Student Life			
Required	30	Identify the purposes and goals of the student organization.		
Required	31	Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.		
Required	32	Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects.		
Required	33	Identify Internet safety issues and procedures for complying with acceptable use standards.		
	Exploring Robotics and Automation Systems			
Required	34	Define *robotics*, *automation*, and *control systems*.		
Required	35	Investigate careers in robotics, automation, and control systems.		
Required	36	Research the history and development of robotics, automation, and control systems.		
Required	37	Explain the universal systems model (i.e., input, process, and output).		
Required	38	Apply direct and indirect measurement systems and coordinate systems.		
Required	39	Identify open and closed loops in control systems.		
	Applying the Basics of Electronics			
Required	40	Describe the concepts of voltage, current, and resistance.		
Required	41	Describe the difference between alternating and direct current.		
Required	42	Identify the primary components in electronic systems.		
Required	43	Describe the differences between and uses of analog and digital systems.		
Required	44	Describe the operation of basic logic circuits.		
Required	45	Measure circuit values with a multimeter.		
Required	46	Identify the primary types of data transmission hardware.		

	Exploring Microprocessor/Microcontroller (Computer) System Basics			
Required	47	Describe the function of an operating system.		
Required	48	Describe the essential components of a computing system.		
Required	49	Describe the software applications of computer technology within automation systems.		
Required	50	Describe how computers are used to control automated systems.		
Required	51	Describe the function of interfacing robotic systems.		
Required	52	Describe the function of a microcontroller/logic controller.		
Required	53	Describe the fundamentals of computer numeric control (CNC).		
Required	54	Identify microcontrollers and their functions within industry tools, including CNC.		
Required	55	Develop a computer-controlled model solution to a problem.		
	Manipulating and Controlling Data			
Required	56	Describe the need for data manipulation and control.		
Required	57	Manipulate data.		
Required	58	Ensure the security of data.		
	Exploring Communication and Networking			
Required	59	Explain types of communication/networking and layers.		
Required	60	Describe various types of ports, channels, and controllers for robotic communications.		
Required	61	Define a process control network (PCN).		
Required	62	Plan a PCN for various systems.		
	Exploring the Components of Robotics and Automation Systems			
Required	63	Describe types and functions of sensors.		
Required	64	Describe the options for power supplies and movement systems.		
Required	65	Describe types and functions of relays.		
Required	66	Describe various hardware and software used in the industry.		
Required	67	Describe precision measurement equipment and techniques.		
Required	68	Describe components or processes that typically require precision measurement.		
	Assembling an Automated System			
Required	69	Compare open and proprietary hardware components.		
Required	70	Simulate functions of all components of a working automated system.		

Required	71	Assemble an automated system.		
Required	72	Modify (re-engineer) the design of an existing system.		
Required	73	Simulate precision measurements of components in a control system.		
Required	74	Simulate control, robotics, and automation systems.		
	Programming an Automated System			
Required	75	Implement basic programming procedures.		
Required	76	Select the most appropriate programming language/platform for application.		
Required	77	Program an automated system.		

	Locally Developed Tasks/Competencies			