Virginia CTE

Engineering Concepts and Processes III (2023)

Demonstrating Personal Qualities and Abilities	1	Demonstrate creativity and innovation. 1
	2	Demonstrate critical thinking and problem solving. 2
	3	Demonstrate initiative and self-direction. 3
	4	Demonstrate integrity. 4
	5	Demonstrate work ethic. 5
Demonstrating Interpersonal Skills	6	Demonstrate conflict-resolution skills. 6
	7	Demonstrate listening and speaking skills. 7
	8	Demonstrate respect for diversity. 8
	9	Demonstrate customer service skills. 9
	10	Collaborate with team members. 10
Demonstrating Professional Competencies	11	Demonstrate big-picture thinking. 11
	12	Demonstrate career- and life-management skills. 12
	13	Demonstrate continuous learning and adaptability. 13
	14	Manage time and resources. 14
	15	Demonstrate information-literacy skills. 15
	16	Demonstrate an understanding of information security. 16
	17	Maintain working knowledge of current information-technology (IT) systems. 17
	18	Demonstrate proficiency with technologies, tools, and machines common to a specific occupation. 18
		Apply mathematical skills to job-specific tasks. 19

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	20 **Demonstrate professionalism.** 20
	21 **Demonstrate reading and writing skills.** 21
	22 **Demonstrate workplace safety.** 22
Examining All Aspects of an Industry	23 **Examine aspects of planning within an industry/organization.** 23
	24 **Examine aspects of management within an industry/organization.** 24
	25 **Examine aspects of financial responsibility within an industry/organization.** 25
	26 **Examine technical and production skills required of workers within an industry/organization.** 26
	27 **Examine principles of technology that underlie an industry/organization.** 27
	28 **Examine labor issues related to an industry/organization.** 28
	29 **Examine community issues related to an industry/organization.** 29
	30 **Examine health, safety, and environmental issues related to an industry/organization.** 30
Addressing Elements of Student Life	31 **Identify the purposes and goals of the student organization.** 31
	32 **Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.** 32
	33 **Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects.** 33
	34 **Identify Internet safety issues and procedures for complying with acceptable use standards.** 34
Exploring Work-Based Learning	35 **Identify the types of work-based learning (WBL) opportunities.** 35
	36 **Reflect on lessons learned during the WBL experience.** 36
	37 **Explore career opportunities related to the WBL experience.** 37
	38 **Participate in a WBL experience, when appropriate.** 38
Functioning as a Team on an Engineering Project	39 **Explain the purpose and functions of a project team.** 39
	40 **Explain the benefits of multiple perspectives and diverse skills in solving practical engineering problems.** 40

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41 **Describe the organization of a team for an engineering project.** 41

42 **Identify the steps in a team's life cycle.** 42

43 **Deliver constructive feedback.** 43

44 **Interpret constructive feedback.** 44

45 **Explain the importance of generating consensus for the project idea to team members.** 45

46 **Describe conflict resolution techniques within a team.** 46

47 **Identify active-listening techniques.** 47

48 **Explain the benefits of active listening.** 48

49 **Demonstrate formal and informal professional communication.** 49

50 **Perform self-evaluations and a team peer review.** 50

51 **Identify ways to motivate individuals and teams.** 51

52 **Demonstrate the ability to work with a team on an engineering design project.** 52

Applying Project Management Skills to an Engineering Design Project

53 **Identify an engineering problem.** 53

54 **Create a proposal for an engineering project.** 54

55 **Outline a project life cycle.** 55

56 **Identify the components of a goal.** 56

57 **Assess the available resources for a project.** 57

58 **Allocate resources.** 58

59 **Apply project management tools.** 59

60 **Prioritize the procedures to complete a project.** 60

61 **Assign tasks to team members.** 61

62 **Track progress.** 62

63 **Analyze results.** 63

64 **Create a technical report on an engineering project.** 64

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Create a multimedia presentation of a finished proposal. 65

Identifying Product and Process Trends	**66** Identify the stages of a product life cycle. 66
	67 Assess the costs of product and system life cycles. 67
	68 Assess a new product or system currently entering the market. 68
	69 Describe the factors necessary for changes in technology. 69
	70 Define forecasting. 70
	71 Research current technological trends. 71
	72 Explain the objectives and importance of a feasibility study. 72
Exploring Engineering Ethics	**73** Compare professional and personal ethics. 73
	74 Identify ethical theories. 74
	75 Research a real-world case study. 75