Virginia CTE

Engineering Explorations I (8450) 36 weeks

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A Demonstrating Personal Qualities and Abilities EE.1

1 Demonstrate creativity and innovation. EE.1.1

2 Demonstrate critical thinking and problem solving. EE.1.2

3 Demonstrate initiative and self-direction. EE.1.3

4 Demonstrate integrity. EE.1.4

5 Demonstrate work ethic. EE.1.5

B Demonstrating Interpersonal Skills EE.2

6 Demonstrate conflict-resolution skills. EE.2.6

7 Demonstrate listening and speaking skills. EE.2.7

8 Demonstrate respect for diversity. EE.2.8

9 Demonstrate customer service skills. EE.2.9

10 Collaborate with team members. EE.2.10

C Demonstrating Professional Competencies EE.3

11 Demonstrate big-picture thinking. EE.3.11

12 Demonstrate career- and life-management skills. EE.3.12

13 Demonstrate continuous learning and adaptability. EE.3.13

14 Manage time and resources. EE.3.14

15 Demonstrate information-literacy skills. EE.3.15

16 Demonstrate an understanding of information security. EE.3.16

17 Maintain working knowledge of current information-technology (IT) systems. EE.3.17

18 Demonstrate proficiency with technologies, tools, and machines common to a specific occupation. EE.3.18

19 Apply mathematical skills to job-specific tasks. EE.3.19

20 Demonstrate professionalism. EE.3.20

21 Demonstrate reading and writing skills. EE.3.21

22 Demonstrate workplace safety. EE.3.22

D Examining All Aspects of an Industry EE.4

23 Examine aspects of planning within an industry/organization. EE.4.23

24 Examine aspects of management within an industry/organization. EE.4.24

25 Examine aspects of financial responsibility within an industry/organization. EE.4.25

26 Examine technical and production skills required of workers within an industry/organization. EE.4.26

27 Examine principles of technology that underlie an industry/organization. EE.4.27

28 Examine labor issues related to an industry/organization. EE.4.28

29 Examine community issues related to an industry/organization. EE.4.29

30 Examine health, safety, and environmental issues related to an industry/organization. EE.4.30

E Addressing Elements of Student Life EE.5

31 Identify the purposes and goals of the student organization. EE.5.31

32 Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult. EE.5.32

33 Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects. EE.5.33

34 Identify Internet safety issues and procedures for complying with acceptable use standards. EE.5.34

F Exploring Work-Based Learning EE.6

35 Identify the types of work-based learning (WBL) opportunities. EE.6.35

36 Reflect on lessons learned during the WBL experience. EE.6.36

37 Explore career opportunities related to the WBL experience. EE.6.37

38 Participate in a WBL experience, when appropriate. EE.6.38

G Applying Safety in Engineering Studies EE.7

39 Demonstrate knowledge of appropriate personal safety procedures. EE.7.39

40 Comply with safety rules in laboratory activities. EE.7.40

H Examining How Technology Affects Our World EE.8

41 Describe the characteristics and scope of technology. EE.8.41

42 Explain the influence of technological systems. EE.8.42

43 Identify historical technological milestones and advancements. EE.8.43

44 Identify the core concepts of technology. EE.8.44

45 Examine technological systems. EE.8.45

I Investigating How Engineering Affects Our World EE.9

46 Define engineering. EE.9.46

47 Summarize the history of engineering. EE.9.47

48 Identify a diverse selection of worldwide representatives of engineering. EE.9.48

49 Research an engineering achievement. EE.9.49

50 Present information pertaining to an engineering achievement. EE.9.50

J Examining Engineering Practice EE.10

51 Describe the principal fields for specialization in engineering. EE.10.51

52 Summarize the habits of mind of successful professional engineers. EE.10.52

53 Differentiate between an engineer and a technologist. EE.10.53

54 Describe continued education possibilities to support careers in engineering and technology. EE.10.54

55 Explain the importance of communication between engineers and their stakeholders. EE.10.55

56 Explain how ethical behavior of engineers is essential to the betterment of society. EE.10.56

K Practicing Engineering Fundamentals EE.11

57 Identify the benefits of case study analysis. EE.11.57

58 Investigate an existing case study. EE.11.58

59 Apply measuring skills using instrumentation. EE.11.59

60 Demonstrate the use of engineering design graphics. EE.11.60

61 Demonstrate the techniques and benefits of visual communication. EE.11.61

62 Explain rapid prototyping to develop models. EE.11.62

63 Demonstrate research techniques/strategies used by engineers. EE.11.63

64 Define risk and safety. EE.11.64

L Examining the Engineering Design Process EE.12

65 Define an engineering design process. EE.12.65

66 Define an engineering design problem. EE.12.66

67 Identify the specifications/requirements of the design problem. EE.12.67

68 Research existing solutions to the design problem. EE.12.68

69 Generate multiple solutions to the design problem. EE.12.69

70 Visually communicate the solutions to a design problem. EE.12.70

71 Evaluate the criteria and constraints of each potential solution to the design problem. EE.12.71

72 Justify an optimal solution to the design problem. EE.12.72

73 Create a model or prototype for the chosen solution. EE.12.73

74 Create a test plan based on specifications/requirements. EE.12.74

75 Test the solution to the design problem. EE.12.75

76 Evaluate the test results. EE.12.76

77 Modify the solution to the design problem, if needed. EE.12.77

78 Test the modification/alternate solution, if needed. EE.12.78

79 Document the final project report. EE.12.79

80 Present the final project report. EE.12.80

M Identifying Real-world Problems EE.13

81 Research local problems that could benefit from engineering solutions. EE.13.81

82 Design an engineering solution to a local problem, using an engineering design process. EE.13.82