Virginia CTE

Introduction to Power, Structural, and Technical Systems (8016/36 weeks)

Introduction to Power, Structural, and Technical Systems (8016/36 weeks) IPST

A Demonstrating Personal Qualities and Abilities IPST.1

1 Demonstrate creativity and innovation. IPST.1.1

2 Demonstrate critical thinking and problem solving. IPST.1.2

3 Demonstrate initiative and self-direction. IPST.1.3

4 Demonstrate integrity. IPST.1.4

5 Demonstrate work ethic. IPST.1.5

B Demonstrating Interpersonal Skills IPST.2

6 Demonstrate conflict-resolution skills. IPST.2.6

7 Demonstrate listening and speaking skills. IPST.2.7

8 Demonstrate respect for diversity. IPST.2.8

9 Demonstrate customer service skills. IPST.2.9

10 Collaborate with team members. IPST.2.10

C Demonstrating Professional Competencies IPST.3

11 Demonstrate big-picture thinking. IPST.3.11

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

13 Demonstrate continuous learning and adaptability. IPST.3.13

14 Manage time and resources. IPST.3.14

15 Demonstrate information-literacy skills. IPST.3.15

16 Demonstrate an understanding of information security. IPST.3.16

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

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

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

20 Demonstrate professionalism. IPST.3.20

21 Demonstrate reading and writing skills. IPST.3.21

22 Demonstrate workplace safety. IPST.3.22

D Examining All Aspects of an Industry IPST.4

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

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

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

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

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

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

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

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

E Addressing Elements of Student Life IPST.5

31 Identify the purposes and goals of the student organization. IPST.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. IPST.5.32

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

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

F Exploring Work-Based Learning IPST.6

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

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

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

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

G Exploring Leadership Opportunities through FFA IPST.7

39 Identify the role of supervised agricultural experiences (SAEs) in agricultural education. IPST.7.39

40 Participate in an SAE. IPST.7.40

41 Identify the benefits and responsibilities of FFA membership. IPST.7.41

42 Describe leadership characteristics and opportunities as they relate to agriculture and FFA. IPST.7.42

43 Apply for an FFA degree and/or an agricultural proficiency award. IPST.7.43

H Applying Safety Practices in the Agricultural Mechanics Lab IPST.8

44 Demonstrate safe practices in the agricultural mechanics lab. IPST.8.44

45 Identify marked safety areas and posted evacuation routes. IPST.8.45

46 Explain the use of eye wash stations. IPST.8.46

47 Demonstrate knowledge of SDS. IPST.8.47

48 Use protective clothing and equipment. IPST.8.48

49 Demonstrate the use, storage, and disposal of chemicals. IPST.8.49

50 Explain the use of fire protection equipment. IPST.8.50

51 Demonstrate the safe use of standard and metric hand tools. IPST.8.51

52 Demonstrate the safe use of power tools and equipment. IPST.8.52

53 Use standard and metric precision-measuring tools. IPST.8.53

I Exploring Alternative Energies IPST.9

54 Identify alternative energy sources. IPST.9.54

55 Describe the use of batteries to power agricultural equipment. IPST.9.55

56 Research alternative fuels. IPST.9.56

J Gaining an Overview of the Importance of Soil and Plant Science in the Landscaping Industry IPST.10

57 Identify all major tools and equipment and their applications. IPST.10.57

58 Identify the operation of agricultural machinery and equipment. IPST.10.58

59 Explain safe highway operation of agricultural machinery. IPST.10.59

60 Conduct pre- and/or post-operation inspection of tractor and equipment. IPST.10.60

61 Conduct daily service and care of tractor and equipment. IPST.10.61

62 Explain how to safely connect an attachment and/or implement. IPST.10.62

K Understanding Precision Agricultural Management IPST.11

63 Research technologies used in precision agricultural management. IPST.11.63

64 Explain the procedure for operating a GPS receiver. IPST.11.64

65 Demonstrate the ability to collect data and apply that data in developing a map. IPST.11.65

L Identifying Fundamentals of Engines IPST.12

66 Identify the operating principles of an internal combustion engine. IPST.12.66

67 Explain the differences between a two-stroke and a four-stroke engine. IPST.12.67

68 Explain the differences between gasoline and diesel engines. IPST.12.68

M Understanding Fundamentals of Drive Systems IPST.13

69 Identify the function and operating principles of the power train. IPST.13.69

70 Differentiate between power take-off (PTO) systems. IPST.13.70

71 Explain the operation of final drives. IPST.13.71

72 Explain the operation of planetary gears. IPST.13.72

73 Explain the operation of inboard and outboard brakes. IPST.13.73

74 Troubleshoot drive system components. IPST.13.74

N Understanding the Fundamentals of Hydraulics IPST.14

75 Identify the application of hydraulics in agriculture. IPST.14.75

76 Explain the components of a hydraulic system. IPST.14.76

O Understanding Agricultural Machinery Electrical Systems IPST.15

77 Explain the application of safety switches on agricultural machines. IPST.15.77

78 Explain the application of electricity in agricultural equipment. IPST.15.78

P Completing Plumbing Practices for Agricultural Structures IPST.16

79 Identify materials used in plumbing. IPST.16.79

80 Identify pipe fittings by type. IPST.16.80

81 Assemble plastic pipe. IPST.16.81

Q Conducting Concrete and Masonry Practices for Agricultural Structures IPST.17

82 Identify materials for concrete construction. IPST.17.82

83 Calculate the quantity and cost of materials for a job. IPST.17.83

84 Mix concrete. IPST.17.84

85 Place concrete in forms. IPST.17.85

86 Finish concrete slabs. IPST.17.86

R Planning for and Conducting Carpentry Practices for Agricultural Structures IPST.18

87 Identify site planning considerations for agricultural structures. IPST.18.87

88 Use plans and working drawings. IPST.18.88

89 Figure a bill of materials. IPST.18.89

90 Construct an agricultural structure or project. IPST.18.90

S Performing Electrical Operations for Agricultural Structures IPST.19

91 Explain the history, use, and function of electrical energy in agriculture. IPST.19.91

92 Demonstrate electrical wiring. IPST.19.92

T Performing Metal Fabrication Operations for Agricultural Structures IPST.20

93 Identify safe practices in arc welding. IPST.20.93

94 Identify types of electrodes, filler rods, and fluxes. IPST.20.94

95 Identify metals. IPST.20.95

96 Prepare equipment and materials for welding. IPST.20.96

97 Perform welding operations. IPST.20.97

U Performing Cold Metal Work for Agricultural Structures IPST.21

98 Identify safety practices for metal striking and machine tools. IPST.21.98

99 Drill holes, using a metal drill bit. IPST.21.99

100 Use metal files and metal cutting tools. IPST.21.100

101 Determine tap and die sizes. IPST.21.101

102 Cut threads with tap and die. IPST.21.102

V Reconditioning Tools IPST.22

103 Identify safe practices for using keen edge tools and grinding equipment. IPST.22.103

104 Perform grinding operations with a pedestal/bench grinder and/or portable/hand-held disc/angle grinder. IPST.22.104

105 Sharpen common tools. IPST.22.105

106 Identify appropriate shapes and angles of cutting edges for wood and metal cutting tools. IPST.22.106