

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

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(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
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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
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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
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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
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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