

# 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

---

**19 Apply mathematical skills to job-specific tasks.** 19

---

**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

- 
- 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**
- 
- 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**
- 
- 65 Create a multimedia presentation of a finished proposal. 65**
- 

**Applying Project  
Management Skills to an  
Engineering Design  
Project**

## 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