INDUSTRIAL DESIGN (534)

DESCRIPTION

This instructional course prepares individuals to apply technical knowledge and skills to develop and create concepts that optimize the function, value, and appearance of products for the benefit of both user and manufacturer. (IDSA)

STANDARDS, OBJECTIVES, AND INDICATORS

STANDARD 1  5% of Exam Blueprint

◆ STUDENTS WILL DEMONSTRATE KNOWLEDGE OF INDUSTRIAL DESIGN AND PROFESSION.

Objective 1: Students will demonstrate knowledge of the industrial design profession, job standards, professional development, and explore higher education and career opportunities.

Objective 2: Students will understand the relationship of industrial design to other design and related professions.

   1. Graphic designers
   2. Interior designers
   3. Architects
   4. Engineers

Objective 3: Students will explore careers and opportunities in industrial design

   1. Salary/hours/working conditions
   2. Work expectations
   3. Freelance conditions
   4. Post-secondary education

STANDARD 2  11% of Exam Blueprint

◆ STUDENTS WILL UNDERSTAND AND BE ABLE TO APPLY THE DESIGN PROCESS TO PRODUCTS AND SYSTEMS.

Objective 1: Students will understand principles of design research in relation to problem finding and problem solving

   1. Observation
   2. Experience
   3. Inquiry
   4. Data synthesis
   5. Target audience

Objective 2: Students will understand and be able to apply principles for ideation and divergent thinking (brainstorming).
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1. Explore ideas.
2. Question
3. Make Connections
4. Validate an idea
5. Develop the concept based upon validation

Objective 3: Students will understand and use the workflow process.

1. Research
2. Thumbnails
3. Sketches
4. Full color rendering
5. Digital rendering
6. Mock-up
7. Model

STANDARD 3 25% of Exam Blueprint

◊ Students will demonstrate knowledge of design elements and principles in solving simple industrial design problems.

Objective 1: Students will be able to render an idea utilizing the elements of design.
1. Lines in space (Chaos and order)
2. Surface
3. Form/volume
4. Structure
5. Value
6. Color (Color themes, theory, and wheel)
7. Texture

Objective 2: Students will demonstrate an ability to utilize principles of 3D design in form development.
1. Balance (visual)
2. Unity/Variety
3. Contrast
4. Emphasis
5. Direction and Movement
6. Repetition
7. Proportion

Objective 3: Students will interpret and critique artistic use of design elements and principles in product design.
1. Form vs. Function
2. Physical balance

STANDARD 4 9% of Exam Blueprint

◊ Students will demonstrate knowledge of human factors related to design.

Objective 1: Students will understand how human anatomy, physiology, and psychology apply to product development.
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Objective 2: Students will be able to demonstrate the application of human factors in product design.
   1. Ergonomics
   2. Aesthetics
   3. Haptic

Objective 3: Students will be able to demonstrate knowledge of the impact of design and technology has on the individual, society, and the environment.
   1. Social sustainability
   2. Environmental sustainability
   3. Cultural sustainability

STANDARD 5 4% of Exam Blueprint

◊ STUDENTS WILL CONCEIVE AND CREATE A PRODUCT.

Objective 1: Conceive and develop a mockup of the product.
   1. Quick 3D rough draft.

Objective 2: Build a model of the product.
   1. Refined 3D example.

STANDARD 6 11% of Exam Blueprint

◊ STUDENTS WILL UNDERSTAND AND DEMONSTRATE THE ABILITY TO PRESENT IDEAS.

Objective 1: Students will be able to use multiple techniques, tools, and processes to develop compelling 2D and 3D product concept presentations and articulating the process used in their form development.

Objective 2: Students will understand the importance of working individually or as a team in developing effective presentations.
   1. Visual presentation of the product (PowerPoint, presentation board, 3D model)
   2. Student presence (posture, communication, body language, dress)
   3. Presentation of idea, sell the product’s functionality, aesthetics, and sustainability.

STANDARD 7 24% of Exam Blueprint

◊ STUDENTS WILL DEMONSTRATE A KNOWLEDGE AND USE OF COMPUTER TECHNOLOGY.

Objective 1: Students will demonstrate knowledge of basic computer vocabulary and techniques.
   1. Tools and shortcuts
   2. Color modes
   3. Vectors vs raster qualities and advantages
   4. Adobe software terminology i.e. guides, strokes.

Objective 2: Students will understand file types and use them appropriately.
   1. Print applications TIFF, JPG, etc.
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2. Web applications PNG, WMF, etc.
3. File Transfer IGES, STL, PDF, etc.
4. Resolution and how it is used.

Objective 3: Students will use appropriate software for design communication and implementation for job/project completion.
   1. Adobe Illustrator
   2. Adobe Photoshop
   3. Others (Autodesk software, CAD, etc.)

Objective 4: Know the appropriate color mode in computer applications
   1. CMYK
   2. RGB

STANDARD 8 7% of Exam Blueprint

♦ Students will understand basic ethical and legal issues involved in design.

Objective 1: Define ways to protect your ideas.
Objective 2: Discuss types of patents and their merits.
Objective 3: Students will practice ethics and rules governing industrial design.

STANDARD 9 2% of Exam Blueprint

♦ Students will demonstrate safe practices.

Objective 1: Know and apply basic safety rules for working with tools, machines, and materials.
Objective 2: Know and apply the basics for keeping machines and tools in good working order.
Objective 3: Know and apply basic safety procedures when working with computers and electronic devices and understanding archiving process for digital files.
Objective 4: Clean and maintain an orderly work area.

STANDARD 10 2% of Exam Blueprint

♦ Students will enhance their understanding of Industrial Design as a profession and will develop professional skills for the workplace.

Objective 1: As a participating member of the SkillsUSA student organization, complete the SkillsUSA Level 2 Professional Development Program.
   1. Measure/modify short-term goals.
   2. Identify stress sources.
   3. Select characteristics of a positive image.
   5. Demonstrate awareness of professional organizations.
   6. Apply team skills to a group project.
   7. Observe and critique team skills at a local professional meeting.
   8. Demonstrate business meeting skills.
   9. Explore workplace ethics: codes of conduct.
   10. Demonstrate social etiquette.
11. Complete survey for employment opportunities.
12. Review a professional journal and develop a three- to five-minute speech.
13. Complete a job application.
15. Explore supervisory and management roles in an organization.
16. Conduct a worker interview.
17. Perform a self-evaluation of proficiency in program competencies.

Objective 2: Serve in the school’s SkillsUSA chapter as a committee member.

Objective 3: As a participating member of the SkillsUSA student organization, complete the SkillsUSA Level 3 Professional Development Program.
   1. Evaluate your career and training goals.
   2. Market your career choice.
   3. Develop personal financial skills
   4. Serve as a volunteer in the community.
   5. Plan and develop a business.
   6. Conduct a worker interview.
   7. Develop a résumé and write a cover letter.
   8. Demonstrate interviewing skills.
   9. Understand the cost of customer service.
  10. Identify and apply conflict resolution skills.
  11. Demonstrate evaluation skills.
  12. Examine workplace ethics: the role of values in making decisions.
  13. Perform a skill demonstration.
  14. Learn what is contained in Material Safety Data Sheets (MSDS).
  15. Perform a self-evaluation of proficiency in program competencies.
  16. Participate in an actual or simulated job interview.

Objective 4: Serve as an officer in the school’s chapter of SkillsUSA

Objective 5: Participate in an authorized SkillsUSA drafting competition.

Objective 6: Display a professional attitude toward the instructor and peers.

Objective 7: Students will demonstrate knowledge of professional work standards.
   1. Professionalism; punctuality, dependability, and engagement

Objective 8: Students will create a portfolio of their design work.