Engineering Design and Presentation II

Subject: Career and Technical Education
Grade: 11
Expectations: 73
Breakouts: 213

(a) Introduction.

1. Career and technical education instruction provides content aligned with challenging academic standards, industry-relevant technical knowledge, and college and career readiness skills for students to further their education and succeed in current and emerging professions.

2. The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster focuses on planning, managing, and providing scientific research and professional and technical services, including laboratory and testing services, and research and development services.

3. Engineering Design and Presentation II is a continuation of knowledge and skills learned in Engineering Design and Presentation I. Students enrolled in this course will demonstrate advanced knowledge and skills of a system design process as it applies to engineering fields and project management using multiple software applications and tools necessary to produce and present working drawings, solid model renderings, and prototypes. Students will expand on the use of a variety of computer hardware and software applications to complete assignments and projects. Through implementation of a system desiT(n)-1.9 (m) (i)3.n.1 (siT p.1 (siTroi)1.c2.4 (e)(n)-9 (s,.1 ()7.9 (nd)6-0.)7.6 u.1 (siTd (o)(n)-9 n.1 (siT0.9 (m)0s4 (i)3.4i6 ( )-3ll
nt methods.

e encouraged to participate in extended learning experiences such as career and technical student organizations
eadership or extracurricular organizations.

s that contain the word "including" reference content that must be mastered, while those containing the phrase
re intended as possible illustrative examples.

Skills Statements

t demonstrates professional standards/employability skills as required by business and industry. The student is
o:

stinguish between an engineering technician, engineering technologist, and engineer;

(i) distinguish between an engineering technician, engineering technologist, and engineer

entify employment and career opportunities in engineering and describe the educational requirements for each;

(i) identify employment opportunities in engineering

ii) identify career opportunities in engineering

ii) describe the educational requirements for [employment opportunities in engineering]

(C) investigate and describe the requirements of industry-based certifications in engineering;

(i) investigate the requirements of industry-based certifications in engineering

(ii) describe the requirements of industry-based certifications in engineering

(D) demonstrate the principles of teamwork related to engineering and technology;

(i) demonstrate the principles of teamwork related to engineering

(ii) demonstrate the principles of teamwork related to technology

(E) research and describe governmental regulations, including health and safety; Tjv.1 1 Tf0 Tc n.6 ()4

(C) use strategies such as decision matrices, flow charts, or Gantt charts to maintain the project schedule and quality of project.

(i) use strategies to maintain the project schedule

(ii) use strategies to maintain the quality of project

(D)

(5) The student applies the concepts and skills of computer-aided drafting and design software to perform the following tasks. The student is expected to:

(A) prepare drawings to American National Standards Institute (ANSI) and International Organization for Standardization (ISO) graphic standards;

(i) prepare drawings to American National Standards Institute (ANSI) graphic standards

(ii) prepare drawings to International Organization for Standardization (ISO) graphic standards

(B) customize software user interface;

(i) customize software user interface

(C) prepare and use advanced views such as auxiliary, section, and break-away;

(i) prepare advanced views

(ii) use advanced views

(D) draw detailed parts, assembly diagrams, and sub-assembly diagrams;

(i) draw detailed parts

(ii) draw detailed assembly diagrams

(iii) draw detailed sub-assembly diagrams

(E) indicate tolerances and standard fittings using appropriate library functions;

(i) indicate tolerances using appropriate library functions

(ii) indicate standard fittings using appropriate library functions

(F) demonstrate 2 (n)Body <AMCID 72 BDC -0.002 Tc 0.002 Tw -24.808 -2.06 Td[(()-4.4 (ii)-0.6A808 -2Tw -22.066 Td 66.1 (ctett BD

(C) identify and classify hazardous materials and wastes according to Occupational Safety and Health Administration (OSHA) regulations;

(i) identify hazardous materials according to Occupational Safety and Health Administration (OSHA) regulations

(ii) identify hazardous wastes according to Occupational Safety and Health Administration (OSHA) regulations

(iii) classify hazardous material according to Occupational Safety and Health Administration (OSHA) regulations

(iv) classify hazardous wastes according to Occupational Safety and Health Administration (OSHA) regulations

(D) describe the appropriate disposal of hazardous materials and wastes appropriately;

(i) describe the appropriate disposal of hazardous materials appropriately

(ii) describe the appropriate disposal of hazardous wastes appropriately

(E) perform maintenance on selected tools, equipment, and machines;

(i) perform maintenance on selected tools

(ii) perform maintenance on selected equipment

(iii) perform maintenance on selected machines

(F) handle and store tools and materials correctly; and

(i) handle tools correctly

(ii) handle materials correctly

(iii) store tools correctly

(iv) store materials correctly

(G)

(D) apply decision-making strategies when developing solutions;

(i) apply decision-making strategies when developing solutions

(E) identify quality-control issues in engineering design and production;

(i) identify quality-control issues in engineering design

(ii) identify quality-control issues in production

(F) describe perceptions of the quality of products and how they affect engineering decisions;

(i) describe perceptions of the quality of products

(ii) describe how [perceptions of the quality of products] affect engineering decisions

(G)

(xii) evaluate constraints of systems engineering, including environmental, pertaining to a problem

(xiii) evaluate constraints of systems engineering, including ethical, pertaining to a problem

(xiv) evaluate constraints of systems engineering, including political, pertaining to a problem

(xv) evaluate constraints of systems engineering, including regulatory, pertaining to a problem

(xvi) evaluate constraints of systems engineering, including legal, pertaining to a problem

(E) identify or create alternative solutions to a problem using a variety of techniques such as brainstorming, reverse engineering, and researching engineered and natural solutions;

(i) identify or create alternative solutions to a problem using a variety of techniques

(F) test and evaluate proposed solutions using tools and methods such as models, prototypes, mock-ups, simulations, critical design review, statistical analysis, or experiments; and

(i) test proposed solutions using tools

(ii) test proposed solutions using methods

(iii) evaluate proposed solutions using tools-1-2 (s)1.8 (299d[(te)1b)-4 (la)-2 0.004 latool 3y.l1 Tf-0.002 Tc.1 (p)-1.9 (e)to