

DESIGN TEAM KNOWLEDGE ASSESSMENT

Component 1 of the TIDEE Design Team Readiness Assessment

ASSESSMENT INSTRUMENT

- Purpose:** Formative assessment of students' **knowledge** of the engineering design process, teamwork, and design communication for early stages of baccalaureate engineering degree programs.
- Instrument Type:** Constructed-response questions related to the engineering design process, teamwork, and design communication.
- Implementation:** Requires 15 to 20 minutes for administration, 3 to 5 minutes to score one student's response. Scoring scale and decision rules provided.

INSTRUMENT DEVELOPMENT

- Authors:** Developed and validated by the "Transferable Integrated Design Engineering Education" or TIDEE consortium of schools. Contributors include: Denny Davis, Larry McKenzie, Michael Trevisan, and David McLean (Washington State University); Steven Beyerlein (University of Idaho); Cynthia Atman and Robin Adams (University of Washington); Kenneth Gentili (Tacoma Community College); Robert Christianson and Jeffrey McCauley (Green River Community College); and Patricia Daniels, Teodora Rutar, and Phillip Thompson (Seattle University).
- Contact:** Denny C. Davis, TIDEE project director, Washington State University, PO Box 646120, Pullman, WA 99164-6120.
Phone: 509-335-7993. Email: davis@wsu.edu.
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SCORING CRITERIA

DESIGN TEAM KNOWLEDGE ASSESSMENT

Name: _____

Scorer Instructions: Check each criterion (listed below) as it is evident in student responses.
Student scores are the number of criteria checked.

CRITERIA FOR KNOWLEDGE OF ENGINEERING DESIGN PROCESS

- Gathering information:** Gather information / research problem / customer needs
- Defining requirements:** Establishing problem requirements / goals / constraints
- Idea generation:** Generating ideas / brainstorming / creativity
- Evaluation:** Analyzing ideas / testing / modeling concepts
- Making decisions:** Choosing best option / selecting / planning implementation
- Implementation:** Implementing decisions / producing / delivering design to client
- Process development:** Reviewing process / improving process / practicing iteration

Total DESIGN PROCESS KNOWLEDGE Score (maximum = 7)

CRITERIA FOR KNOWLEDGE OF TEAMWORK

- Purpose:** Establishing purpose / goals / focus
- Leadership:** Team leader / shared leadership
- Accountability:** Assigning responsibilities / establishing accountability
- Climate:** Achieving positive team attitude / support / commitment
- Productivity:** Time management / task orientation
- Resources:** Using team member skills / resources / knowledge
- Communication:** Maintaining communicating / listening to members

Total TEAMWORK KNOWLEDGE Score (maximum = 7)

CRITERIA FOR KNOWLEDGE OF COMMUNICATION

- Clarity:** Clear statement of ideas / proper word use
- Organization:** Effective flow / logical order
- Quality of presentation:** Format / style / quality of voice or expression
- Supporting evidence:** Thoroughness / examples / visual aids
- Relevance:** Relevant to audience backgrounds / needs
- Credible:** Accuracy / reliability / credibility
- Interpersonal:** Listening / responsive / eye contact / body language

Total COMMUNICATION KNOWLEDGE Score (maximum = 7)

DECISION RULES FOR SCORING DESIGN TEAM KNOWLEDGE ASSESSMENT

FOR KNOWLEDGE OF ENGINEERING DESIGN PROCESS (QUESTION A)

- A.1. If a student lists a key word (a word listed within a criterion definition) in the proper context associated with a scoring criterion, he or she will receive credit for that item.
- A.2. Evidence that supports satisfying a given criterion may include key words, statements, or diagrams.
- A.3. Additional evidence beyond the word “design” is necessary for credit for the criteria “evaluation” or “implementation.”
- A.4. “Process iteration” can be denoted by a word, statements, or arrows.
- A.5. Credit will be given for a criterion if only one of the descriptors is mentioned in the response associated with that criterion. For example, “customer needs” alone will meet the “problem definition” criterion.

FOR KNOWLEDGE OF TEAMWORK (QUESTION B)

- B.1. The mention of a timekeeper is considered adequate reference for “time management,” so “timekeeper” satisfies the “productivity” criterion.
- B.2. Assigning roles and responsibilities does NOT constitute “team leader” or “shared leadership.”
- B.3. Assigning a team leader role DOES satisfy the “leadership” criterion.
- B.4. Credit will be given for a criterion if only one of the descriptors is mentioned in the response associated with that criterion. For example: Citing “team member skills” satisfies the “resources” criterion.

FOR KNOWLEDGE OF COMMUNICATION (QUESTION C)

- C.1. Credit will be given for satisfying a criterion if appropriate evidence is given for ONE or BOTH of the two communication scenarios given, (i.e., giving oral instructions or presenting experimental data).
- C.2. Credit will be given for the “quality of presentation” criterion if “preparation” or “confidence” is used in the response.
- C.3. Credit will be given for a criterion if only one of the descriptors is mentioned in the response associated with that criterion. For example: Listing “thoroughness” satisfies the “supporting evidence” criterion.