Cluster Knowledge and Skill Statement

Communications

Statement: Demonstrate effective oral, written, and visual communication.

Performance Element: Discuss effective methods to communicate essential concepts to diverse audiences.

- Measurement Criteria: Write and report subjective and objective information.
- Measurement Criteria: Write and report information with the intent of being persuasive.
- Measurement Criteria: Write and report information with the intent of being informational.
- Measurement Criteria: Write and report information with the intent of being instructional.
- Measurement Criteria: Analyze the audience and presentation environment.
- Measurement Criteria: Explain technical concepts to non-technical audiences.
- Measurement Criteria: Use professional terminology.
- Measurement Criteria: Identify, select, use appropriate multimedia resources.
- Measurement Criteria: Apply active listening skills using reflection, restatement, questioning, and clarification.
- Measurement Criteria: Discern between various communication techniques and their ability to convey various types of information.

Performance Element: Effectively communicate scientific, technological, engineering, or mathematical information to the intended audience.

- Measurement Criteria: Prepare scientific, technological, engineering, or mathematical reports oral presentation skills.
- Measurement Criteria: Prepare scientific, technological, engineering, or mathematical reports written presentation skills.
- Measurement Criteria: Prepare scientific, technological, engineering, or mathematical reports visual presentation skills.
- Measurement Criteria: Prepare scientific, technological, engineering, or mathematical reports oral presentation skills.
- Measurement Criteria: Prepare scientific, technological, engineering, or mathematical reports multimedia presentation skills.
- Measurement Criteria: Explain the various methods of giving and obtaining information.

Performance Element: Read, interpret, and analyze technical materials, discerning information and concepts.

- Measurement Criteria: Write and/or present a report on technical literature; use graphical tools as appropriate.
- Measurement Criteria: Discriminate between fact and opinion.
- Measurement Criteria: Seek clarity of communication by rephrasing, questioning and summarizing.
- Measurement Criteria: Validate understanding and provide and or obtain constructive feedback.
Information Technology Applications

Statement: Use information technology to gather, store, apply and communicate data.

Performance Element: Use information technology as it supports the gathering, storage, and transfer of data and information.

Measurement Criteria: Apply different techniques for gathering storing and transferring data.

Measurement Criteria: Select and use the tools to analyze and synthesize data.

Measurement Criteria: Describe the meaning of probability and how it applies to a set of data.

Performance Element: Select and use different forms of information technology.

Measurement Criteria: Use computer to conduct research.

Measurement Criteria: Write a report based on Internet research, using calculations, graphs, and/or spreadsheets.

Measurement Criteria: Use simulation, modeling, prototype techniques to solve problems.

Measurement Criteria: Create, organize, manage, and distribute electronic information.

Performance Element: Apply technology to visualize a problem.

Measurement Criteria: Select the proper visualization tools.

Measurement Criteria: Communicate data visually.

Statement: Evaluate the different technological tools used to manipulate and model data.

Performance Element: Use information technology tools to manipulate and create information from data.

Measurement Criteria: Use statistical tools to analyze data.

Measurement Criteria: Query and extract information from data.

Measurement Criteria: Create knowledge from data.

Performance Element: Use modeling, simulation, and visualization to efficiently analyze, synthesize and communicate information.

Measurement Criteria: Apply techniques for modeling systems or problems.

Measurement Criteria: Apply techniques for scientific visualization and animation of complex physical systems or problems.

Measurement Criteria: Test different scenarios to multiple variables.

Performance Element: Apply current computer programming languages.

Measurement Criteria: Write and execute a simple program. i.e. Basic, Java, C++.

Performance Element: Use statistical tools to show reliability of data.

Measurement Criteria: Using a selected statistical tool, compute data reliability.
Statement: Apply safety practices in your environment.

Performance Element: Develop good safety and health practices.
- **Measurement Criteria:** Exercise good safety practices.
- **Measurement Criteria:** Follow various regulatory codes, such as EPA, FEMA, UL, OSHA, CSA.
- **Measurement Criteria:** Reference and use material safety data sheets (MSDS).
- **Measurement Criteria:** Encourage others to employ safe practices.

Performance Element: Use appropriate safety techniques, equipment, and procedures.
- **Measurement Criteria:** Develop and implement emergency plans.
- **Measurement Criteria:** Develop and implement workplace lab safety plan.
- **Measurement Criteria:** Follow workplace regulations and record-keeping requirements.
- **Measurement Criteria:** Use safety equipment in the workplace.
- **Measurement Criteria:** Use eyewash and safety showers.
- **Measurement Criteria:** Accurately interpret safety signs, symbols, and labels.
- **Measurement Criteria:** Demonstrate basic first aid.
- **Measurement Criteria:** Use tools and equipment safely.

Statement: Develop a broad awareness of safety, health, and environmental hazards.

Performance Element: Identify existing and potential hazards to safety, health, and environment.
- **Measurement Criteria:** Describe potential safety, health, and environmental hazards in various situations.
- **Measurement Criteria:** Identify physical, chemical, toxicological, biological, and radioactive hazards.

Statement: Engage in continuous improvement of environmental, health and safety practices.

Performance Element: Provide feedback and analysis to those in charge of environmental, health and safety practices.
- **Measurement Criteria:** Analyze environmental impacts.
- **Measurement Criteria:** Conduct a safety audit.
- **Measurement Criteria:** Assess the impact of unsafe practices.
- **Measurement Criteria:** Apply appropriate corrective action.
- **Measurement Criteria:** Develop new safety practices and procedures for new and existing technology.
Cluster Knowledge and Skill Statement

Leadership and Teamwork

Statement: Participate effectively on a team.

Performance Element: Work effectively with others from diverse backgrounds.

Measurement Criteria: Identify the challenge of barriers when working on a diverse team.
Measurement Criteria: Work effectively with multi-disciplinary teams.
Measurement Criteria: Develop consensus for best outcome.

Performance Element: Exercise the ability to lead or follow in a team environment.

Measurement Criteria: Describe leadership skills necessary to bring a team to consensus on a new method of working.
Measurement Criteria: Appropriately give/take credit and responsibility.
Measurement Criteria: Divide tasks among a team of three, with no designated leader.
Measurement Criteria: Demonstrate various management skills (i.e., strategies, collaborative, resourcefulness, flexibility) and decision-making models.
Measurement Criteria: Communicate effectively verbally and non-verbally with team colleagues.
Measurement Criteria: Exhibit a strong sense of team identity and commitment to purpose
Measurement Criteria: Act responsibly as a team member, completing assigned tasks in a timely and effective manner.
Measurement Criteria: Respond to critical situations appropriately as a member of a team.
Measurement Criteria: Delegate tasks, responsibility and authority as appropriate.
Measurement Criteria: Follow up on tasks delegated to others.
Measurement Criteria: Recognize and reward individual and team contributions.
Measurement Criteria: Collaborate with others to formulate team objectives.

Statement: Understand how and when to form teams.

Performance Element: Exercise leadership and teamwork skills.

Measurement Criteria: Analyze the need for a team.
Measurement Criteria: Identify roles of team members.
Measurement Criteria: Recognize individual abilities and the importance of forming teams with others whose abilities are complementary.
Measurement Criteria: Know how and when to move people in and out of the team environment.
Measurement Criteria: Recognize characteristics of effective teams.
Measurement Criteria: Explain the role of a team on a project.
Measurement Criteria: Use teamwork skills to achieve goals, solve problems, and manage conflict.
Measurement Criteria: Be involved in mentor/mentored relationships.
Measurement Criteria: Give and receive feedback constructively.
Cluster Knowledge and Skill Statement

Ethics and Legal Responsibilities

Statement: Know current ethical and legal standards in the scientific and mathematics as well as the engineering and technology community.

Performance Element: Adhere to ethical and legal standards.

- **Measurement Criteria:** Evaluate the pros and cons of current ethical questions and scenarios, for example, environmental stewardship, genetic research, and living subjects in research.
- **Measurement Criteria:** Make ethical decisions when presented with ethical choices or moral dilemmas.
- **Measurement Criteria:** Comply with ethical standards (code of ethics) for your field.
- **Measurement Criteria:** Follow legal requirements for the treatment of people in the workplace. (ADA, EEO).
- **Measurement Criteria:** Follow requirements of regulatory agencies in the scientific, and mathematics, engineering, or technology field (e.g., NFPA, OSHA, EPA, ADA, EOE, FCC).
- **Measurement Criteria:** Develop personal ethics for real-life situations/experiences in science, technology, engineering, and mathematics.
- **Measurement Criteria:** Evaluate personal, professional, and organizational ethics.
- **Measurement Criteria:** Explain fundamentals of patents, trademarks, copyrights, and proprietary information.
- **Measurement Criteria:** Compare and contrast personal ethical values with various professional and organizational codes of ethics.
- **Measurement Criteria:** Recognize and refute misleading information.
- **Measurement Criteria:** Evaluate methods for protecting and conserving resources.
Cluster Knowledge and Skill Statement

Employability and Career Development

**Statement:** Identify patterns, relations, and functions of an organization or a workplace.

Performance Element: Study the essential parts of an organization or a workplace for the purpose of future employment.

**Measurement Criteria:** Demonstrate ability to gather information about an organization.

**Measurement Criteria:** Evaluate and compare employment or advancement opportunities.

**Statement:** Exhibit continuous improvement for personal and professional growth.

Performance Element: Develop skills and knowledge for career growth.

**Measurement Criteria:** Identify and participate in continuous education opportunities.

**Measurement Criteria:** Engage in continuous self-assessment and goals modification for personal and professional growth.

**Measurement Criteria:** Participate in professional or trade organizations.

Performance Element: Identify performance expectations of a job.

**Measurement Criteria:** Practice good work habits/time management.

**Measurement Criteria:** Be a team player.

**Measurement Criteria:** Demonstrate respectful behavior in workplace.

**Measurement Criteria:** Maintain knowledge and skills.

**Measurement Criteria:** Describe benefits of certifications for various career paths.

**Statement:** Research career pathways in science, technology, engineering, and mathematics.

Performance Element: Engage in a large variety of science, technology, engineering, or mathematics experiences to determine personal interest in respective pathways.

**Measurement Criteria:** List resources for researching funding sources for scientific projects and technology.

**Measurement Criteria:** List careers that you have investigated, internships that you could apply for, and job shadowing opportunities that you have identified.

**Measurement Criteria:** Construct and maintain a portfolio of experiences and accomplishments.