## Iowa State University

### Engineering & Technology Workplace Competencies*

**Definition:** A competency is a grouping of similar knowledge, skills, behaviors and motivations. A “core” competency is one that is regularly mentioned by many of our employers.

<table>
<thead>
<tr>
<th>Competency</th>
<th>Core?</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis and Judgment</td>
<td>✓</td>
<td>Identifying and understanding issues, problems and opportunities; developing the relevant criteria and comparing data from different sources to draw conclusions; using effective approaches for choosing a course of action or developing appropriate solutions; taking action that is consistent with available facts, constraints, and probable consequences.</td>
</tr>
<tr>
<td>Communication</td>
<td>✓</td>
<td>Clearly conveying information and ideas through a variety of media to individuals or groups in a manner that engages the audience and helps them understand and retain the message.</td>
</tr>
<tr>
<td>Continuous Learning</td>
<td>✓</td>
<td>Actively identifying new areas for learning; regularly creating and taking advantage of learning opportunities; using newly gained knowledge and skill on the job, and learning through application.</td>
</tr>
<tr>
<td>Cultural Adaptability</td>
<td></td>
<td>Being open to and making changes to accommodate the differences found in other cultures in order to interact effectively with individuals and groups from a different cultural background.</td>
</tr>
<tr>
<td>Customer Focus</td>
<td></td>
<td>Making customers and their needs a primary focus of one’s actions; developing and sustaining productive customer relationships.</td>
</tr>
<tr>
<td>Engineering/Technical Knowledge</td>
<td>✓</td>
<td>Having achieved a satisfactory level of knowledge in the relevant specialty areas of engineering/technology, science and mathematics.</td>
</tr>
<tr>
<td>General Knowledge</td>
<td>✓</td>
<td>Having achieved a satisfactory level of knowledge outside the areas of engineering, technology, science and mathematics.</td>
</tr>
<tr>
<td>Initiative</td>
<td>✓</td>
<td>Taking prompt action to accomplish objectives; taking action to achieve goals beyond what is required; being proactive.</td>
</tr>
<tr>
<td>Innovation</td>
<td></td>
<td>Generating creative, non-traditional technical solutions in work situations; trying different and novel ways to deal with work problems and opportunities.</td>
</tr>
<tr>
<td>Integrity</td>
<td></td>
<td>Maintaining social, ethical, and organization norms; firmly adhering to codes of conduct and professional ethical principles.</td>
</tr>
<tr>
<td>Planning</td>
<td></td>
<td>Effectively managing one’s time and resources to ensure that work is completed efficiently.</td>
</tr>
<tr>
<td>Professional Impact</td>
<td></td>
<td>Creating a good first impression, commanding attention and respect, showing an air of confidence.</td>
</tr>
<tr>
<td>Quality Orientation</td>
<td></td>
<td>Accomplishing tasks by considering all areas involved, no matter how small; showing concern for all aspects of the job; accurately checking processes and tasks; being watchful over a period of time.</td>
</tr>
<tr>
<td>Safety Awareness</td>
<td></td>
<td>Identifying and correcting conditions that affect employee safety; upholding safety standards.</td>
</tr>
<tr>
<td>Teamwork</td>
<td>✓</td>
<td>Effectively participating as a member of a team to move the team toward the completion of goals.</td>
</tr>
</tbody>
</table>

---

1. Analysis and judgment

- **Definition:** Identifying and understanding issues, problems, and opportunities; comparing data from different sources to draw conclusions; using effective approaches for choosing a course of action or developing appropriate solutions; taking action that is consistent with available facts, constraints, and probable consequences.

- **Key Actions**
  - **Identifies issues, problems and opportunities.** Recognizes issues, problems, or opportunities and determines whether action is needed.
  - **Gathers information.** Identifies the need for and collects information to better understand issues, problems, and opportunities.
  - **Interprets information.** Integrates information from a variety of sources; detects trends, associations, and cause-effect relationships.
  - **Generates alternatives.** Creates relevant options for addressing problems/opportunities and achieving desired outcomes.
  - **Commits to action.** Implements decisions or initiates action within a reasonable time.
  - **Chooses appropriate actions.** Formulates clear decision criteria; evaluates options by considering implications and consequences; chooses an effective option.
  - **Involves appropriate actions.** Includes others in the decision-making process as warranted to obtain good information, make the most appropriate decisions, and ensure buy-in and understanding of the resulting decisions.
  - **Values diversity.** Embraces and values diverse collection of inputs, values, perspectives, and thought paradigms in approaching the application of engineering and technology to products and processes.

2. Communication

- **Definition:** Clearly conveying information and ideas through a variety of media to individuals or groups in a manner that engages the audience and helps them understand and retain the message.

- **Key Actions**
  - **Organizes the communication.** Clarifies purpose and importance; stresses major points; follows a logical sequence.
  - **Maintains audience attention.** Keeps the audience engaged through use of techniques such as analogies, illustrations, body language, and voice inflection.
  - **Adjusts to the audience.** Frames message in line with audience experience, background, and expectations; uses terms, examples, and analogies that are meaningful to the audience.
  - **Ensures understanding.** Seeks input from audience; checks understanding; presents message in different ways to enhance understanding.
  - **Adheres to accepted conventions.** Uses syntax, pace, volume, diction, and mechanics appropriate to the media being used.
  - **Comprehends communication from others.** Attends to messages from others; correctly interprets messages and responds appropriately.

3. Continuous learning

- **Definition:** Actively identifying new areas for learning; regularly creating and taking advantage of learning opportunities; using newly gained knowledge and skill on the job and learning through their application.

- **Key Actions**
  - **Targets learning needs.** Seeks and uses feedback and other sources of information to identify appropriate areas for learning.
  - **Seeks learning activities.** Identifies and participates in appropriate learning activities (e.g., courses, reading, self-study, coaching, and experiential learning) that help fulfill learning needs.
  - **Maximizes learning.** Actively participates in learning activities in a way that makes the most of the learning experience (e.g., takes notes, asks questions, critically analyzes information, keeps on-the-job application in mind, does required tasks).
  - **Applies knowledge or skill.** Puts new knowledge, understanding, or skill to practical use on the job; furthers learning through trial and error.
  - **Takes risks in learning.** Puts self in unfamiliar or uncomfortable situation in order to learn; asks questions at the risk of appearing foolish; takes on challenging or unfamiliar assignments.

---

4. Cultural Adaptability
   - **Definition:** Being open to and making changes to accommodate the differences found in other cultures in order to interact effectively with individuals and groups from a different cultural background.
   - **Key Actions**
     - **Demonstrates inclusive behavior.** Establishes effective relationships with people of other cultures and backgrounds; shows genuine acceptance of people from backgrounds different from one's own.
     - **Exhibits sensitivity.** Exhibits sensitivity to and respect for the perspectives and interests of people of a different culture; attends to and tries to understand different perspectives and approaches.
     - **Adapts behavior to other cultures.** Adjusts own approach to interactions, communications, and decision making to be appropriate and effective within another culture without sacrificing own values.
     - **Adapts products and processes to cultural concerns.** Identifies, understands and incorporates cultural factors into the design of products and processes.

5. Customer Focus
   - **Definition:** Making customers and their needs a primary focus of one's actions; developing and sustaining productive customer relationships.
   - **Key Actions**
     - **Seeks to understand customers.** Actively seeks information to understand customers' circumstances, problems, expectations, and needs.
     - **Educates customers.** Shares information with customers to build their understanding of issues and capabilities.
     - **Builds collaborative relationships.** Builds rapport and cooperative relationships with customers.
     - **Takes action to meet customer needs and concerns.** Considers how actions or plans will affect customers; responds quickly to meet customer needs and resolve problems; avoids over-commitments.
     - **Sets up customer feedback systems.** Implements effective ways to monitor and evaluate customer concerns, issues, and satisfaction and to anticipate customer needs.

6. Engineering/Technical Knowledge
   - **Definition:** Having achieved a satisfactory level of knowledge in the relevant specialty areas of mathematics, science and engineering/technology.
   - **Key Actions**
     - **Knowledge of Mathematics.** Demonstrates a knowledge of the mathematical principles required to practice engineering or apply and manage technology in one's specialty area.
     - **Knowledge of Science.** Demonstrates a knowledge of the scientific principles required to practice engineering or apply and manage technology in one's specialty area.
     - **Knowledge of experimental analysis.** Demonstrates a knowledge of the principles of experimental data analysis in one's specialty area.
     - **Knowledge of current engineering/technology tools.** Demonstrates a knowledge of the use of contemporary tools needed to practice engineering or apply and manage technology in an effective manner.
     - **Knowledge of technology.** Demonstrates a knowledge of engineering/technology principles required to practice in one's specialty area.

7. General Knowledge
   - **Definition:** Having achieved a satisfactory level of knowledge outside the areas of mathematics, science, engineering and technology.
   - **Key Actions**
     - **General Knowledge.** Demonstrates a knowledge of important current issues and events outside the areas of mathematics, science, engineering and technology
     - **Relates general knowledge to engineering/technology.** Demonstrates a knowledge of the interrelationships between important issues and events outside of engineering/technology and one's engineering/technology specialty area.

8. Initiative

- **Definition:** Taking prompt action to accomplish objectives; taking action to achieve goals beyond what is required; being proactive.

- **Key Actions**
  - **Responds quickly.** Takes immediate action when confronted with a problem or when made aware of a situation.
  - **Takes independent action.** Implements new ideas or potential solutions without prompting; does not wait for others to take action or to request action.
  - **Goes above and beyond.** Takes action that goes beyond job requirements in order to achieve objectives.

9. Innovation

- **Definition:** Generating innovative solutions in work situations; trying different and novel ways to deal with work problems and opportunities.

- **Key Actions**
  - **Challenges paradigms.** Identifies implicit assumptions in the way problems or situations are defined or presented; sees alternative ways to view or define problems; is not constrained by the thoughts or approaches of others.
  - **Leverages diverse resources.** Draws upon multiple and diverse sources (individuals, disciplines, bodies of knowledge) for ideas and inspiration
  - **Thinks expansively.** Combines ideas in unique ways or makes connections between disparate ideas; explores different lines of thought; views situations from multiple perspectives; brainstorms multiple approaches/solutions.
  - **Evaluates multiple solutions.** Examines numerous potential solutions and evaluates each before accepting any.
  - **Ensures relevance.** Targets important areas for innovation and develops solutions that address meaningful work issues.

10. Integrity

- **Definition:** Maintaining social, ethical, and organizational norms; firmly adhering to codes of conduct and professional ethical principles.

- **Key Actions**
  - **Demonstrates honesty.** Deals with people in an honest and forthright manner; represents information and data accurately and completely.
  - **Keeps commitments.** Performs actions as promised; does not share confidential information.
  - **Behaves consistently.** Ensures that words and actions are consistent; behaves consistently across situations.

11. Planning

- **Definition:** Effectively managing one's time and resources to ensure that work is completed efficiently.

- **Key Actions**
  - **Prioritizes.** Identifies more critical and less critical activities and tasks; adjusts priorities when appropriate.
  - **Makes preparations.** Ensures that required equipment and/or materials are in appropriate locations so that own and others' work can be done effectively.
  - **Schedules.** Effectively allocates own time to complete work; coordinates own and others' schedules to avoid conflicts.
  - **Leverages resources.** Takes advantage of available resources (individuals, processes, departments, and tools) to complete work efficiently.
  - **Stays focused.** Uses time effectively and prevents irrelevant issues or distractions from interfering with work completion.

12. Professional Impact

- **Definition:** Creating a good first impression; commanding attention and respect; showing an air of confidence.

- **Key Actions**
  - **Dresses appropriately.** Maintains professional, businesslike image.
  - **Displays professional demeanor.** Exhibits a calm appearance; does not appear nervous or overly anxious; responds openly and warmly when appropriate.
  - **Speaks confidently.** Speaks with a self-assured tone of voice.

13. Quality Orientation

- **Definition:** Accomplishing tasks by considering all areas involved, no matter how small; showing concern for all aspects of the job; accurately checking processes and tasks; being watchful over a period of time.

- **Key Actions**
  - **Follows procedures.** Accurately and carefully follows established procedures for completing work tasks.
  - **Ensures high-quality output.** Vigilantly watches over job processes, tasks, and work products to ensure freedom from errors, omissions, or defects.
  - **Takes action.** Initiates action to correct quality problems or notifies others of quality issues as appropriate.

14. Safety Awareness

- **Definition:** Identifying and correcting conditions that affect employee safety; upholding safety standards.

- **Key Actions**
  - **Identifies safety issues and problems.** Detects hazardous working conditions and safety problems; checks equipment and/or work area regularly.
  - **Takes corrective action.** Reports or corrects unsafe working conditions; makes recommendations and/or improves safety and security procedures; enforces safety regulations and procedures.
  - **Monitors the corrective action.** Monitors safety or security issues after taking corrective action and ensures continued compliance.

15. Teamwork

- **Definition:** Actively participating as a member of a team to move the team toward the completion of goals.

- **Key Actions**
  - **Facilitates goal accomplishment.** Makes procedural or process suggestions for achieving team goals or performing team functions; provides necessary resources or helps to remove obstacles to help the team accomplish its goals.
  - **Involves others.** Listens to and fully involves others in team decisions and actions; values and uses individual differences and talents.
  - **Informs others on the team.** Shares important or relevant information with the team.
  - **Models commitment.** Adheres to the team's expectations and guidelines; fulfills team responsibilities; demonstrates personal commitment to the team.