The Information Technology Workforce and Skills for the Future

September 15, 2021
NICE Framework Category: Operate and Maintain

Provides the support, administration, and maintenance necessary to ensure effective and efficient technology system performance and security.
Objective 4.1 Align the NICE Framework to the NIST Cybersecurity Framework, NIST Privacy Framework, and other cybersecurity, privacy, and risk management publications
Employer-Led National IT Skill Standards

Ann Beheler, Project Lead/PI

NICE Webinar
September 15, 2021
ITSS 2020 and Beyond Project’s Purpose

- **WIDEN** the pipeline of qualified candidates for the many open IT/Cyber positions nationally

- **CREATE** a contemporary and future-facing set of comprehensive IT Skill Standards.

- **ASSIST** both employers and educators to more easily apply the standards.
ITSS Engages Employers

- **Business & Industry Leadership Team** process is the basis for work with employers to identify what they want graduates to know 12-36 month into the future

- **Employers co-lead** the work, not just advise

BILT Model Created by the National Convergence Technology Center [www.connectedtech.org](http://www.connectedtech.org)
Approximately 100 Thought Leaders were recruited and vetted to identify the first set of project Job Clusters

- Thought Leaders are typically CTO’s, CIO’s, CISO’s or other individuals responsible for “seeing the future” to keep their companies in business.

- Goal was to identify 8-10 of the most critical and difficult to fill job clusters for the future through four facilitated meetings

- Project team synthesized results

- Employer consensus was obtained for 7 job clusters initially

- A second set of Thought Leader meetings were held to identify remaining 2 to 3 clusters; several skill sets under consideration instead
Job Cluster Definitions

• The thought leaders defined what each job cluster included
  • **Example:** “Technical Project Management comprises the planning and management of a technical initiative from concept through to a concrete deliverable. This includes overall responsibility for outcomes and requires specific knowledge of technologies, applied methodologies and development models to ensure success in planning, managing budget, estimation and execution of the project. Additionally, this area is responsible for change management. The Technical Project Management serves as the liaison between the business and technical experts. This definition was adapted from Iasa Global with input from national IT Thought Leaders.”
First 7 Job Clusters Identified

Skill standards completed
- Infrastructure Connectivity Administration and Engineering
- Technical Support
- Technical Project Management
- Software Development and Engineering (recently completed)
- Data Management and Engineering (the IT side of Data)
- Data Analytics and Predictive Modeling

Skill standards in process
- Cybersecurity (more details to follow)
Employers SMEs Drove Job Cluster Meetings

- **The Project Team compiled pro forma KSAs and Tasks** for employer evaluation using a variety of existing skill standards (e.g. NICE and NIST, ACM, various state standards) – no reinvention of the wheel

- **Employer SMEs voted** on the pro forma KSAs and Tasks they want workforce ready grads to do/have in the future using the structured, repeatable process from the BILT, followed by discussion

- **Employer SMEs could add, change, and delete** items during the 2-3 meetings per job cluster that were held

- **Employers identified the appropriate level of Employability Skills** needed per job cluster
Task, Knowledge, Skill and Ability

This is a snippet of a KSA and Task list the entire list contain a minimum of 100 items across all sections.

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-1</td>
<td>Install and maintain network infrastructure device operating system software (e.g., IOS, firmware).</td>
<td>3.0</td>
</tr>
<tr>
<td>T-2</td>
<td>Install and configure hardware, software, and peripheral equipment for system users in accordance with organizational standards.</td>
<td>3.7</td>
</tr>
<tr>
<td>T-3</td>
<td>Manage changes/updates for both internal and external customers when policies and procedures change.</td>
<td>3.4</td>
</tr>
<tr>
<td>T-4</td>
<td>Maintain computer hardware.</td>
<td>3.6</td>
</tr>
<tr>
<td>T-5</td>
<td>Provide technical support for software maintenance or use.</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Knowledge

Knowledge focuses on the understanding of concepts. It is theoretical. An individual may have an understanding of a topic or tool or some textbook knowledge of it but have no experience applying it. For example, someone might have read hundreds of articles on health and nutrition, many of them in scientific journals, but that doesn't make that person qualified to dispense advice on nutrition.

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Description</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-1</td>
<td>Knowledge of the basic operation of computers.</td>
<td>3.9</td>
</tr>
<tr>
<td>K-2</td>
<td>Knowledge of computer networking concepts and protocols, and network security methodologies.</td>
<td>2.5</td>
</tr>
<tr>
<td>K-3</td>
<td>Knowledge of operating environments, organizational software and applications.</td>
<td>3.6</td>
</tr>
<tr>
<td>K-4</td>
<td>Knowledge of practices of internal, external, and global customers (as applicable).</td>
<td>3.2</td>
</tr>
<tr>
<td>K-5</td>
<td>Knowledge of internal organizational communication processes.</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Skills

The capabilities or proficiencies developed through training or hands-on experience. Skills are the practical application of theoretical knowledge. Someone can take a course to gain knowledge of concepts without developing the skills to apply those concepts. Development of skills requires hands-on application of the concepts.

<table>
<thead>
<tr>
<th>Skill</th>
<th>Description</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>Skill in identifying possible causes of degradation of system performance or availability as well as skill in initiating actions needed to mitigate this degradation.</td>
<td>3.3</td>
</tr>
<tr>
<td>S-2</td>
<td>Skill in using the appropriate tools for repairing software, hardware, and peripheral equipment of a system.</td>
<td>3.4</td>
</tr>
<tr>
<td>S-3</td>
<td>Skill in conducting research for troubleshooting novel client-level problems.</td>
<td>3.1</td>
</tr>
<tr>
<td>S-4</td>
<td>Skill in configuring and validating network workstations and peripherals in accordance with approved standards and/or specifications.</td>
<td>3.4</td>
</tr>
</tbody>
</table>
# Employability Skills – 3 Possible levels

**Focuses on these 12 areas**
- Workplace Professionalism & Work Ethics
- Written Communication
- Oral Communication
- Teamwork
- Problem Solving & Critical Thinking
- Organization & Planning
- Adaptability & Flexibility
- Initiative
- Accuracy
- Cultural Competence
- Self Development & Career Development

## Technical Support Employability Skills

<table>
<thead>
<tr>
<th>Workplace Professionalism &amp; Work Ethics</th>
<th>Focuses on these 12 areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 - Employee learns expectations of workplace environment (professional behavior and ethics) and adheres to practices with some guidance. Level 2 - Employee exhibits sound professionalism, judgment, and integrity and accepts responsibility for own behavior. Employee exhibits these qualities without guidance but occasionally refers to policies as needed.</td>
<td>Workplace Professionalism &amp; Work Ethics</td>
</tr>
<tr>
<td>Written Communication</td>
<td>Focuses on these 12 areas</td>
</tr>
<tr>
<td>Level 1 - Employee understands written instructions and executes tasks with guidance and feedback from supervisor. Employee clearly communicates concepts in writing. Level 2 - Employee comprehends and executes written instructions with minimal guidance. Employee composes well-organized written documents.</td>
<td>Written Communication</td>
</tr>
<tr>
<td>Oral Communication</td>
<td>Focuses on these 12 areas</td>
</tr>
<tr>
<td>Level 1 - Employee understands oral instructions and executes tasks with guidance and feedback from supervisor. Employee communicates concepts orally while clarifying for meaning. Employee develops listening skills. Level 2 - Employee comprehends and executes oral instructions with minimal guidance and exhibits good listening skills. Employee clarifies for meaning without needing prompting from supervisor.</td>
<td>Oral Communication</td>
</tr>
<tr>
<td>Teamwork</td>
<td>Focuses on these 12 areas</td>
</tr>
<tr>
<td>Level 1 - With guidance and feedback from supervisor, employee obeys team rules and understands team member roles. Employee actively participates in team activities, volunteers for special tasks, and establishes rapport with co-workers. Level 2 - Employee demonstrates commitment, enthusiasm and supports team members. Employee follows up on assigned tasks and leads by example.</td>
<td>Teamwork</td>
</tr>
</tbody>
</table>
After The Initial Job Cluster Meetings

• **Project team** synthesized data across meetings (votes + discussion)

• **Follow-up meeting** addressed
  • **Employer SMEs verifying the synthesis** done by the team and changing anything they did not approve
  • **Employer SMEs voting on Key Performance Indicators (KPIs)** for Tasks

• **Educator SMEs** also developed **Student Learning Outcomes** after the second employer SME meetings

• **ITSS worked with ~200 different business SMEs over first 6 job clusters**

• **Skill Standards Approved by Texas Skill Standards System for distribution throughout the state**
Components Of Each Job Cluster’s Skill Standards

• Created by employers using the BILT processes
  • Tasks + KSAs with numerical average of votes across SME meetings
    • PDF and Excel formats
  • Key Performance Indicators (KPIs) for Tasks
  • Levels of Key Employability Skills

• Created by educators from the employer-determined KSAs
  • Student Learning Outcomes to use in creating and updating curriculum
How to Access The Skill Standards – No Login Needed

All job cluster results are posted on the ITSS 2020 website https://itskillstandards.org.
## Components Available Per Job Cluster

*Anyone is welcome to use, modify, and/or distribute ITSS findings and data, but you must give clear attribution to the source of this material by citing “IT Skill Standards 2020 and Beyond (NSF ATE project grant DUE 1838535).”

<table>
<thead>
<tr>
<th>SECTION</th>
<th>DOWNLOADS/DOCUMENTS</th>
<th>COMMENTS/ACCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSAs</td>
<td>ICME.KSA.PDF / ICME.KSA.Excel</td>
<td>Sign in</td>
</tr>
<tr>
<td>Student Learning Outcomes</td>
<td>No Documents</td>
<td>Sign in</td>
</tr>
<tr>
<td>Key Performance Indicators</td>
<td>ICME.KPI.PDF</td>
<td>Sign in</td>
</tr>
<tr>
<td>Employability Skills</td>
<td>ICME.ES.PDF</td>
<td>Sign in</td>
</tr>
</tbody>
</table>

This material is based upon work supported by the National Science Foundation under Grant No. 1838535. Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.
Thought Leaders Reconvened to Determine Remaining 2-3 Job Clusters for Remaining Work

• Rather than focus on job clusters, Thought Leaders requested the team to switch focus to creating **3-5 skill sets** to be layered onto previous clusters and possibly other disciplines. Areas under consideration are:
  • AI,
  • ML,
  • Blockchain,
  • 5G (likely integrated into infrastructure),
  • IoT,
  • IT Automation,
  • AR/VR

• After working with NICE, **Cybersecurity job cluster work is being converted to a skill set** instead of duplicating work
Cybersecurity Skill Set

• Focuses on more than awareness and less than enough knowledge and skills to obtain a job in cybersecurity

• Upcoming Employer SME meetings
  • September 29, 2021 from 2-5 ET
  • October 5, 2021 from 11-2 ET
  • Contact Christina Titus to register ctitus@collin.edu
Sustainability

Ongoing process

- **Piloting a crowd-sourcing approach** to keep the job skills updated (Currently testing thru the ITSS 2020 website)

- **Seeking industry financial support** and leadership for continuing support
Upcoming Professional Development

Using Skill Standards to Advance Your College IT Curriculum

• September 17, 2021
• 2 pm – 3 pm ET
• https://bit.ly/ITSSTraining
Other Opportunities For Engagement

• **Provide feedback** on the Skill Standards already posted on ITSS website (http://www.itskillstandards.org)

• **Apply to be an educator SME** for upcoming skill sets that are within your expertise

• **Apply to be an employer SME** for upcoming skill sets that are within your expertise

• **Learn more about how to use the Skill Standards** to update curriculum
How to Register to Provide Feedback – Requires Login

- Registration Page: [https://connectedtech.org/register-login/](https://connectedtech.org/register-login/)
- Helpful videos
  - Signing In and Commenting: [https://youtu.be/lBFgl3nvdV8](https://youtu.be/lBFgl3nvdV8)
  - Comment and Registration: [https://youtu.be/3CzrvUs4Ys4](https://youtu.be/3CzrvUs4Ys4)
Mission

Contribute to the more efficient functioning of the U.S. labor market by providing high-quality job training, employment, labor market information, and income maintenance services primarily through state and local workforce development systems.

8 Guiding Principles—one of which is:

We will strive to turn individuals into career entrepreneurs by:

- equipping them with the information they need
- to develop the knowledge, skills and abilities sought after in the new economy.
Workforce and Labor Market Information (WLMI)

- Bureau of Labor Statistics (BLS)
  - Occupational Employment and Wage Statistics (OEWS)
    - Also has distribution of occupational employment by industry
  - Occupational Employment Projections
  - Occupational Outlook Handbook

- Employment and Training Administration (ETA)
  - Occupational Information Network (O*NET) – career exploration and research
    - Specifically including Knowledge, Skills, and Abilities
  - CareerOneStop – information and services
  - WorkforceGPS – technical assistance website for states and grantees

Both BLS and ETA support development and dissemination of extensive state and local WLMI
O*NET has multiple public-facing websites

- O*NET OnLine
- My Next Move
- My Next Move for Veterans
- Mi Proximo Paso
- O*NET Resource Center
  - Downloadable data files
  - Web services and APIs
  - Open linked data
O*NET SITE TRAFFIC

Standard annual O*NET combined website traffic:

Combined Annual Visits > 60,000,000

Annual Web Service Calls > 800,000,000
Concepts relating to the organization of work

- **Occupation**
  - Is a category that groups together multiple jobs based on “work performed and, in some cases, on the skills, education and/or training needed to perform the work”
  - SOC Classification Principles and Coding Guidelines

- **Job**
  - Multiple jobs in any occupation category
  - The same job title may mean *different* things when used by different employers
  - Different job titles may mean the *same* thing when used by different employers

- **Work Role**
  - A job or position may involve multiple *work roles*

- **Functional work area**

- **Competency**
  - Tasks
  - Knowledge
  - Skills
Occupational Information Network (O*NET) system

- Primary source for **descriptive** information on **occupational** characteristics and requirements

- Covers the work conducted in the U.S. economy
  - 923 occupations
  - Based on 2018 Standard Occupational Classification taxonomy to align with other occupational data sources from BLS and states on wages, employment, outlook
What’s in O*NET?

Knowledge  Interests
Skills      Work Styles
Abilities   Work Values
Tasks       Tools & Technologies
Work Activities Related Occupations
Work Context

Supplemented with:
- Education, Training and Experience Required
- Wages
- Employment Trends/Outlook
- Links to resources on job openings, credentials, education/training
## Both Stable and Dynamic Descriptors of Occupations

<table>
<thead>
<tr>
<th>STABLE descriptors</th>
<th>DYNAMIC descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ 33 Knowledge categories (broad)</td>
<td>▪ 31,079 Technology Skills</td>
</tr>
<tr>
<td>▪ 35 Skill categories (broad)</td>
<td>▪ 52,823 Alternate Titles</td>
</tr>
<tr>
<td>▪ 53 Abilities categories</td>
<td>▪ 19,232 Tasks</td>
</tr>
<tr>
<td>▪ 57 Work Context descriptors</td>
<td></td>
</tr>
<tr>
<td>▪ 20 Work Values</td>
<td></td>
</tr>
<tr>
<td>▪ 15 Work Styles</td>
<td></td>
</tr>
<tr>
<td>▪ 6 Career Interests (R-I-A-S-E-C)</td>
<td></td>
</tr>
</tbody>
</table>
Comparison of O*NET and NICE content

<table>
<thead>
<tr>
<th>O*NET</th>
<th>NICE Cybersecurity Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>923</strong> Occupations</td>
<td><strong>52</strong> Work Roles</td>
</tr>
<tr>
<td><strong>19,566</strong> Tasks</td>
<td><strong>928</strong> Tasks</td>
</tr>
<tr>
<td><strong>33</strong> Knowledge categories</td>
<td><strong>614</strong> Knowledge statements</td>
</tr>
<tr>
<td><strong>35</strong> Skill categories</td>
<td>may be equivalent to Competency?</td>
</tr>
<tr>
<td><strong>8,800+</strong> Technology Skills</td>
<td><strong>359</strong> Skill statements</td>
</tr>
</tbody>
</table>
O*NET Work Activities Hierarchy

- 40 Generalized Work Activities
- 332 Intermediate Work Activities
- 2,069 Detailed Work Activities
- 19,450 Tasks (specific to a single occupation)
Search O*NET occupations by Career Cluster
Partial results for Information Technology cluster

Browse by Career Cluster

Career Clusters contain occupations in the same field of work that require similar skills. Students, parents, and educators can use Career Clusters education plans towards obtaining the necessary knowledge, competencies, and training for success in a particular career pathway.

Information Technology

<table>
<thead>
<tr>
<th>Code</th>
<th>Occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-2051.01</td>
<td>Business Intelligence Analysts</td>
</tr>
<tr>
<td>15-1209.00</td>
<td>Computer Occupations, All Other</td>
</tr>
<tr>
<td>15-1209.08</td>
<td>Computer Systems Engineering/Architects</td>
</tr>
<tr>
<td>15-1232.00</td>
<td>Computer User Support Specialist</td>
</tr>
<tr>
<td>15-1243.01</td>
<td>Data Warehousing Specialist</td>
</tr>
<tr>
<td>15-1289.03</td>
<td>Document Management Specialist</td>
</tr>
<tr>
<td>15-1299.02</td>
<td>Geographic Information Systems Technologists and Technicians</td>
</tr>
<tr>
<td>15-1299.09</td>
<td>Information Technology/Project Managers</td>
</tr>
<tr>
<td>13-1002.00</td>
<td>Project Management Specialists</td>
</tr>
<tr>
<td>13-1101.01</td>
<td>Search Marketing Strategists</td>
</tr>
<tr>
<td>15-1253.00</td>
<td>Software Quality Assurance Analysts and Testers</td>
</tr>
</tbody>
</table>
Partial results for keyword search for “cybersecurity”

Quick Search for: cybersecurity

Showing top 20 occupations for cybersecurity. Closest matches are shown first.

The following terms have been used to augment your search: “cyber”, “security”. You may wish to check your spelling and search again if you received unexpected results.

<table>
<thead>
<tr>
<th>Code</th>
<th>Occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-1299.05</td>
<td>Information Security Engineers</td>
</tr>
<tr>
<td>15-1299.06</td>
<td>Digital Forensics Analysts</td>
</tr>
<tr>
<td>15-1299.04</td>
<td>Penetration Testers</td>
</tr>
<tr>
<td>15-1299.07</td>
<td>Blockchain Engineers</td>
</tr>
<tr>
<td>15-1212.00</td>
<td>Information Security Analysts</td>
</tr>
<tr>
<td>15-1231.00</td>
<td>Computer Network Support Specialists</td>
</tr>
<tr>
<td>11-3021.00</td>
<td>Computer and Information Systems Managers</td>
</tr>
<tr>
<td>15-1211.00</td>
<td>Computer Systems Analysts</td>
</tr>
<tr>
<td>33-3021.00</td>
<td>Detectives and Criminal Investigators</td>
</tr>
<tr>
<td>33-3021.06</td>
<td>Intelligence Analysts</td>
</tr>
</tbody>
</table>
**Summary Report for:**
15-1299.04 - Penetration Testers

Evaluate network system security by conducting simulated internal and external cyberattacks using adversary tools and techniques. Attempt to breach critical systems and gain access to sensitive information to assess system security.

This title represents an occupation for which data collection is currently underway.

### Tasks

- Assess the physical security of servers, systems, or network devices to identify vulnerability to temperature, vandalism, or natural disasters.
- Collect stakeholder data to evaluate risk and to develop mitigation strategies.
- Conduct network and security system audits using established criteria.
- Configure information systems to incorporate principles of least functionality and least access.
- Design security solutions to address known device vulnerabilities.

### Detailed Work Activities

- Develop testing routines or procedures.
- Analyze security of systems, network, or data.
- Prepare scientific or technical reports or presentations.
- Stay informed about current developments in field of specialization.
- Analyze risks to minimize losses or damages.
Technology Skills (updated quarterly)

Summary Report for: 15-1299.08 - Computer Systems Engineers/Architects

Design and develop solutions to complex applications problems, system administration issues, or network concerns. Perform systems management and integration functions.

Sample of reported job titles: Electronic Data Interchange System Developer (EDI System Developer), Information Technology Architect (IT Architect), Network Infrastructure System Engineer, Network Engineer, Solutions Architect, Systems Architect, Systems Consultant, Systems Engineer

Technology Skills

- Development environment software — Apache Ant; Apache Kafka; Common business oriented language COBOL; Go
- Object or component oriented development software — Advanced business application programming ABAP; jQuery; Objective C; Scala
- Operating system software — Microsoft Windows Server; Oracle Solaris; Red Hat Enterprise Linux; UNIX Shell
- Project management software — Confluence; Microsoft Teams; Oracle Primavera Enterprise Project Portfolio Management; Slack
- Web platform development software — Backbone.js; Microsoft ASP.NET Core MVC; React; Spring Framework
O*NET Data Collection
How current is it?
Multi-Method Data Collection

- **Job Incumbents**—primary source
- **Occupational Experts**
  - Both of above complete O*NET survey questionnaires
- **Occupational Analysts**
  - I/O Psychologists using survey responses and following standardized procedures
- **Additional reference resources**
  - Employer job postings, internet research, professional association/customer input—

  (This latter input is independently validated/verified since it is not obtained through a statistically representative sample)
How Current is the Data?

- Ongoing data collection program
- 100+ occupations updated *annually*
- Updated occupations prioritized on multiple factors:
  - Size, growth rate, changes in technology or body of knowledge
- Quarterly database updates (Technology Skills and alternate titles)
The data in O’NET OnLine is regularly updated as part of an ongoing data collection program. For more information, visit the O’NET Resource Center. The table below lists the date and source for data provided for this occupation.

<table>
<thead>
<tr>
<th>Data Collection Information for:</th>
<th>15-1212.00 - Information Security Analysts</th>
<th>Bright Outlook</th>
</tr>
</thead>
</table>

The table below provides information on various aspects of the occupation, including technology skills, alternate titles, education, knowledge, tasks, work activities, work context, work styles, sample of reported titles, abilities, job zone, skills, detailed work activities, interests, and work values.

<table>
<thead>
<tr>
<th>Data Collection Information for:</th>
<th>15-1212.00 - Information Security Analysts</th>
<th>Bright Outlook</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Technology Skills &amp; Tools</th>
<th>Employer Job Postings (2021)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternate Titles</td>
<td>Multiple sources (2020)</td>
</tr>
<tr>
<td>Education</td>
<td>Incumbent Questionnaire Responses (2018)</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Incumbent Questionnaire Responses (2018)</td>
</tr>
<tr>
<td>Tasks</td>
<td>Incumbent Questionnaire Responses (2018)</td>
</tr>
<tr>
<td>Work Activities</td>
<td>Incumbent Questionnaire Responses (2018)</td>
</tr>
<tr>
<td>Work Context</td>
<td>Incumbent Questionnaire Responses (2018)</td>
</tr>
<tr>
<td>Work Styles</td>
<td>Incumbent Questionnaire Responses (2018)</td>
</tr>
<tr>
<td>Sample of Reported Titles</td>
<td>Analyst (2020)</td>
</tr>
<tr>
<td>Abilities</td>
<td>Analyst (2018)</td>
</tr>
<tr>
<td>Job Zone</td>
<td>Analyst (2018)</td>
</tr>
<tr>
<td>Skills</td>
<td>Analyst (2018)</td>
</tr>
<tr>
<td>Detailed Work Activities</td>
<td>Analyst (2014)</td>
</tr>
<tr>
<td>Interests</td>
<td>Analyst (2008)</td>
</tr>
<tr>
<td>Work Values</td>
<td>Analyst (2008)</td>
</tr>
</tbody>
</table>
Competency Model Clearinghouse within CareerOneStop

View an Industry Model
- Automation
- Residential
- Hospitality, Tourism, and Events
- Transportation, Distribution & Logistics
- and others

Latest Industry Models
1. Information Technology

Do It Yourself
1. Build your own Model

What's New
1. Information Technology, Competency Model adopts Leading Foundational
Information Technology and Cybersecurity Competency Models

In 2021, the model was revised to incorporate foundational workplace health and safety skills from the National Institute for Occupational Safety and Health's (NIOSH) Safe + Skilled Workforce Program designed to help protect America's workforce and create safe, healthy, and productive workplaces. For more information, download the Summary of Changes document.

Scroll down to view the industry model selected. Or click on the left menu bar to select another model.

Source: the industry model and academic models in recent formats.

U.S. DEPARTMENT OF LABOR
Cybersecurity, Automation, and Mechatronics models
Q & A
Thank You for Joining Us!

Upcoming Webinar: “Digital Citizenship- Safety and Security for an Online World”

When: Wednesday, October 20, 2021 at 2-3PM ET

Register: https://go.usa.gov/xMDwT

nist.gov/nice/webinars