

# ASVAB Training Relevance Survey

## Presentation to the Defense Advisory Committee on Military Personnel Testing


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# ASVAB Training Relevance Survey

## Purpose

- Evaluate the relevance of content associated with the ASVAB (and other test content/constructs) to success in entry-level military technical training.

## Approach

- Administer a survey to technical training course developers and instructors to collect ratings of relevancy of content knowledge/skill to success in technical training for entry-level military occupations.
- Replicate and extend research conducted by Oppler et al. (1997), which was limited to content associated with the four ASVAB Science & Technical subtests.

# Survey Content Areas

## ASVAB

- Auto and Shop Information (AS)
- Electronics Information (EI)
- General Science (GS)
- Mechanical Comprehension (MC)
- Assembling Objects (AO)
- AFQT Quantitative Reasoning
  - Arithmetic Reasoning (AR)
  - Math Knowledge (MK)
- AFQT Verbal Ability
  - Paragraph Comprehension (PC)
  - Word Knowledge (WK)

## Other

- Cyber Test (CT)
- Computational Thinking

# Relevancy Ratings by Skill Type

## Relevancy Rating Scale

- **Not Relevant (NR)**
  - This knowledge/skill is not relevant for the training.
- **No Better (NB)**
  - Trainees entering training with this knowledge/skill perform no better than those entering without it.
- **Somewhat Better (SB)**
  - Trainees entering training with this knowledge/skill perform somewhat better than those entering without it.
- **Much Better (MB)**
  - Trainees entering training with this knowledge/skill perform much better than those entering without it.

## Skill Type

- **Basic Knowledge**
  - The basic facts, definitions, or terminology associated with specific technical content areas
- **Application**
  - The skill to follow procedures or use different types of tools, equipment, or mathematical equations associated with specific technical content areas
- **Analysis**
  - The skill to use reasoning and analytic abilities, including the skill to troubleshoot a situation, fault isolate a symptom, or solve problems associated with specific technical content areas

# Example of Rating Task

The image below shows an example of a training instructor making ratings for two technical content areas.

| | Basic | | | | Application | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NR | NB | SB | MB | NR | NB | SB | MB | NR | NB | SB | MB |
| Automotive Components (e.g., carburetors, fuel injectors, shock absorbers, distributors, alternators) | ○ | ○ | ○ | ◉ | ○ | ◉ | ○ | ○ | ◉ | ○ | ○ | ○ |
| Automotive Systems (e.g., braking systems, ignition systems, exhaust systems, air conditioning systems) | ◉ | ○ | ○ | ○ | ◉ | ○ | ○ | ○ | ◉ | ○ | ○ | ○ |

# Courses Included in Analysis Sample (k = 160)

## By Service

- Air Force (k = 42)
- Army (k = 28)
- Coast Guard (k = 15)
- Marine Corps (k = 19)
- Navy (k = 57)
- Space Force (k = 4)

## By Training Focus Area

- Electronics (k = 43)
- Mechanical (k = 67)
- Electronics/Mechanical (k = 3)
- Information Technology (k = 14)
- Intelligence (k = 12)
- Science and Engineering (k = 17)
- Other (k = 4)

➢ *Note*. Total number of unique courses = 160; however, 1 was rated by Air Force and Space Force respondents, 3 were rated by Navy and Marine Corps respondents, and 1 was rated by Navy and Coast Guard respondents. Ratings from different Services were analyzed separately for the "By Service" analyses but combined for the "Overall" and "By Training Focus Area" analyses.

# Analysis

## For each Science and Technical subtest, Assembling Objects, and Cyber Test:

- Develop two datasets for each test: one for courses using the test as part of their classification composite, one for courses not using the test.
- For each dataset (for each test) analyze data within course and aggregate results (a) across all courses, (b) by Training Focus Area, and (c) by Service.
  - For each content area within each test, calculate percentages of courses in each of the four relevancy categories (NR, NB, SB, and MB).

## For AFQT constructs Quantitative Reasoning and Verbal Ability (QR, VA) and Computational Thinking:

- Develop single dataset for each construct domain.
- For each construct domain, analyze data within course and aggregate results (a) across all courses, (b) by Training Focus Area, and (c) by Service.
  - For each content area within each domain, calculate percentages of courses in each of the four relevancy categories (NR, NB, SB, MB).

# Example of Results Table

***Table C.1. Training Relevancy of Auto and Shop Information (AS) Content Areas by Skill Type for Courses with AS in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Automotive Information: | | | | | | | | | | | | | | | |
| Automotive Component | 0.0 | 26.9 | 20.4 | 35.5 | 17.2 | 3.2 | 31.2 | 18.3 | 35.5 | 11.8 | 3.2 | 32.3 | 25.8 | 23.7 | 15.1 |
| Automotive Systems | 0.0 | 29.0 | 18.3 | 35.5 | 17.2 | 3.2 | 32.3 | 20.4 | 31.2 | 12.9 | 3.2 | 34.4 | 20.4 | 30.1 | 11.8 |
| Automotive Tools | 0.0 | 19.4 | 11.8 | 34.4 | 34.4 | 3.2 | 21.5 | 14.0 | 28.0 | 33.3 | 4.3 | 25.8 | 22.6 | 30.1 | 17.2 |
| Troubleshooting/Repair | 0.0 | 25.8 | 17.2 | 36.6 | 20.4 | 3.2 | 28.0 | 15.1 | 38.7 | 15.1 | 3.2 | 29.0 | 20.4 | 30.1 | 17.2 |
| Shop Information: | | | | | | | | | | | | | | | |
| Shop Tools | 1.1 | 11.8 | 11.8 | 37.6 | 37.6 | 3.2 | 9.7 | 15.1 | 35.5 | 36.6 | 4.3 | 15,.1 | 23.7 | 30.1 | 26.9 |
| Building Materials | 1.1 | 37.6 | 24.7 | 23.7 | 12.9 | 4.3 | 39.8 | 18.3 | 24.7 | 12.9 | 4.3 | 41.9 | 19.4 | 26.9 | 7.5 |
| Building/Construction Procedures | 1.1 | 43.0 | 30.1 | 18.3 | 7.5 | 4.3 | 44.1 | 24.7 | 20.4 | 6.5 | 4.3 | 50.5 | 21.5 | 20.4 | 3.2 |

*Note.* Ratings represent the average percentage (rounded to nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses using Auto and Shop Information in selection composite. Number of courses = 93.

| % Courses Rated SB or MB |
|---|
| 25.0 – 49.9% |
| 50.0 – 74.9% |
| 75.0% or more |

# Results Summary: Auto and Shop Information

- For training courses requiring AS, relevancy ratings generally support the AS content categories, although somewhat more so for Automotive Information content and “Shop Tools.”
  - Results varied across training focus areas in expected ways (e.g., ratings for Mechanical courses were generally higher than for Electronics courses).
- AS content was generally rated to be much more relevant for those training courses requiring AS than for those that do not.

# Auto and Shop Information Results for Courses with AS in Composite

***Table C.1. Training Relevancy of Auto and Shop Information (AS) Content Areas by Skill Type for Courses with AS in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Automotive Information: | | | | | | | | | | | | | | | |
| Automotive Component | 0.0 | 26.9 | 20.4 | 35.5 | 17.2 | 3.2 | 31.2 | 18.3 | 35.5 | 11.8 | 3.2 | 32.3 | 25.8 | 23.7 | 15.1 |
| Automotive Systems | 0.0 | 29.0 | 18.3 | 35.5 | 17.2 | 3.2 | 32.3 | 20.4 | 31.2 | 12.9 | 3.2 | 34.4 | 20.4 | 30.1 | 11.8 |
| Automotive Tools | 0.0 | 19.4 | 11.8 | 34.4 | 34.4 | 3.2 | 21.5 | 14.0 | 28.0 | 33.3 | 4.3 | 25.8 | 22.6 | 30.1 | 17.2 |
| Troubleshooting/Repair | 0.0 | 25.8 | 17.2 | 36.6 | 20.4 | 3.2 | 28.0 | 15.1 | 38.7 | 15.1 | 3.2 | 29.0 | 20.4 | 30.1 | 17.2 |
| Shop Information: | | | | | | | | | | | | | | | |
| Shop Tools | 1.1 | 11.8 | 11.8 | 37.6 | 37.6 | 3.2 | 9.7 | 15.1 | 35.5 | 36.6 | 4.3 | 15,.1 | 23.7 | 30.1 | 26.9 |
| Building Materials | 1.1 | 37.6 | 24.7 | 23.7 | 12.9 | 4.3 | 39.8 | 18.3 | 24.7 | 12.9 | 4.3 | 41.9 | 19.4 | 26.9 | 7.5 |
| Building/Construction Procedures | 1.1 | 43.0 | 30.1 | 18.3 | 7.5 | 4.3 | 44.1 | 24.7 | 20.4 | 6.5 | 4.3 | 50.5 | 21.5 | 20.4 | 3.2 |

*Note.* Ratings represent the average percentage (rounded to nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses using Auto and Shop Information in selection composite. Number of courses = 93.

# Auto and Shop Information Results for Courses Without AS in Composite

***Table C.9. Training Relevancy of Auto and Shop Information (AS) Content Areas by Skill Type for Courses without AS in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Automotive Information: | | | | | | | | | | | | | | | |
| Automotive Component | 0.0 | 59.7 | 28.4 | 4.5 | 7.5 | 3.0 | 62.7 | 23.9 | 3.0 | 7.5 | 3.0 | 67.2 | 13.4 | 10.4 | 6.0 |
| Automotive Systems | 0.0 | 61.2 | 22.4 | 10.4 | 6.0 | 3.0 | 64.2 | 20.9 | 6.0 | 6.0 | 3.0 | 65.7 | 14.9 | 10.4 | 6.0 |
| Automotive Tools | 0.0 | 56.7 | 22.4 | 9.0 | 11.9 | 3.0 | 59.7 | 16.4 | 13.4 | 7.5 | 3.0 | 59.7 | 16.4 | 11.9 | 9.0 |
| Troubleshooting/Repair | 0.0 | 62.7 | 19.4 | 11.9 | 6.0 | 3.0 | 61.2 | 16.4 | 11.9 | 7.5 | 3.0 | 58.2 | 17.9 | 11.9 | 9.0 |
| Shop Information: | | | | | | | | | | | | | | | |
| Shop Tools | 0.0 | 50.7 | 20.9 | 22.4 | 6.0 | 3.0 | 50.7 | 19.4 | 20.9 | 6.0 | 1.5 | 52.2 | 20.9 | 20.9 | 4.5 |
| Building Materials | 1.5 | 62.7 | 19.4 | 11.9 | 4.5 | 1.5 | 61.2 | 22.4 | 10.4 | 4.5 | 4.5 | 59.7 | 16.4 | 14.9 | 4.5 |
| Building/Construction Procedures | 0.0 | 59.7 | 25.4 | 9.0 | 6.0 | 1.5 | 61.2 | 22.4 | 10.4 | 4.5 | 1.5 | 61.2 | 17.9 | 14.9 | 4.5 |

*Note.* Ratings represent the average percentage (rounded to nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses that do not use Auto and Shop Information in selection composite. Number of courses = 67.

# Results Summary: Electronics Information

- For training courses requiring EI, relevancy ratings generally support all EI content categories.
  - Like AS, ratings for EI generally varied across training focus areas in expected ways (e.g., ratings for Electronics courses were generally higher than for Mechanical courses).
- EI content also was generally rated to be much more relevant for courses requiring EI than for those that do not.

# Electronics Information Results for Courses with EI in Composite

***Table D.1. Training Relevance of Electronics Information (EI) Content Areas by Skill Type for Courses with EI in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Electronics Information: | | | | | | | | | | | | | | | |
| Electrical Tools, Devices, and Materials | 1.3 | 10.0 | 17.5 | 22.5 | 48.8 | 3.8 | 11.3 | 13.8 | 21.3 | 50.0 | 3.8 | 12.5 | 15.0 | 22.5 | 46.3 |
| Electrical Circuits | 0.0 | 10.0 | 16.3 | 20.0 | 53.8 | 2.5 | 12.5 | 12.5 | 23.8 | 48.8 | 2.5 | 15.0 | 12.5 | 26.3 | 43.8 |
| Electricity/Electronic Systems | 0.0 | 11.3 | 21.3 | 16.3 | 51.3 | 1.3 | 13.8 | 16.3 | 26.3 | 42.5 | 1.3 | 15.0 | 13.8 | 28.8 | 41.3 |
| Electrical Current | 1.3 | 12.5 | 16.3 | 21.3 | 48.8 | 1.3 | 13.8 | 16.3 | 23.8 | 45.0 | 1.3 | 13.8 | 16.3 | 26.3 | 42.5 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses using Electronics Information in selection composite. Number of courses = 80.

# Electronics Information Results for Courses Without EI in Composite

***Table D.10. Training Relevancy of Electronics Information (EI) Content Areas by Skill Type for Courses without EI in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Electronics Information: | | | | | | | | | | | | | | | |
| Electrical Tools, Devices, and Materials | 0.0 | 26.0 | 23.4 | 36.4 | 14.3 | 1.3 | 26.0 | 27.3 | 29.9 | 15.6 | 1.3 | 33.8 | 29.9 | 20.8 | 14.3 |
| Electrical Circuits | 2.6 | 24.7 | 32.5 | 24.7 | 15.6 | 1.3 | 27.3 | 31.2 | 27.3 | 13.0 | 2.6 | 32.5 | 29.9 | 22.1 | 13.0 |
| Electricity/Electronic Systems | 1.3 | 23.4 | 23.4 | 26.0 | 26.0 | 0.0 | 26.0 | 24.7 | 28.6 | 20.8 | 1.3 | 29.9 | 26.0 | 20.8 | 22.1 |
| Electrical Current | 0.0 | 31.2 | 24.7 | 23.4 | 20.8 | 1.3 | 32.5 | 27.3 | 20.8 | 18.2 | 1.3 | 33.8 | 26.0 | 22.1 | 16.9 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses that do not use Electronics Information in selection composite. Number of courses = 77.

# Results Summary: General Science

- For training courses requiring GS, relevancy ratings were generally low for most of the GS content categories, with the exception of some in the Physical Sciences ("Force/Motion," "Energy," and "Fluids").
  - Among the training focus areas, GS content categories were rated the highest (and for a greater variety of content categories) for Science and Engineering courses.
- GS content was generally rated to be only *slightly* more relevant for courses requiring GS than for those that don't.

# General Science Results for Courses with GS in Composite

***Table E.1. Training Relevancy of General Science (GS) Content Areas by Skill Type for Courses with GS in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Life Science: | | | | | | | | | | | | | | | |
| Botany | 0.0 | 88.3 | 7.8 | 3.9 | 0.0 | 2.6 | 84.4 | 9.1 | 2.6 | 1.3 | 2.6 | 87.0 | 6.5 | 2.6 | 1.3 |
| Zoology | 0.0 | 87.0 | 9.1 | 2.6 | 1.3 | 2.6 | 85.7 | 7.8 | 1.3 | 2.6 | 2.6 | 87.0 | 6.5 | 1.3 | 2.6 |
| Anatomy/Physiology | 0.0 | 85.7 | 6.5 | 3.9 | 3.9 | 2.6 | 84.4 | 5.2 | 3.9 | 3.9 | 2.6 | 84.4 | 6.5 | 2.6 | 3.9 |
| Ecology | 0.0 | 68.8 | 23.4 | 6.5 | 1.3 | 2.6 | 71.4 | 22.1 | 2.6 | 1.3 | 2.6 | 71.4 | 19.5 | 5.2 | 1.3 |
| Physical Sciences: | | | | | | | | | | | | | | | |
| Force/Motion | 0.0 | 20.8 | 28.6 | 33.8 | 16.9 | 2.6 | 19.5 | 26.0 | 36.4 | 15.6 | 2.6 | 20.8 | 27.3 | 36.4 | 13.0 |
| Energy | 0.0 | 15.6 | 24.7 | 37.7 | 22.1 | 2.6 | 15.6 | 27.3 | 35.1 | 19.5 | 2.6 | 15.6 | 29.9 | 32.5 | 19.5 |
| Fluids | 0.0 | 33.8 | 31.2 | 19.5 | 15.6 | 2.6 | 35.1 | 29.9 | 19.5 | 13.0 | 2.6 | 36.4 | 32.5 | 16.9 | 11.7 |
| Atomic Structure | 0.0 | 58.4 | 22.1 | 13.0 | 6.5 | 2.6 | 61.0 | 23.4 | 7.8 | 5.2 | 3.9 | 59.7 | 23.4 | 7.8 | 5.2 |
| Chemistry | 0.0 | 48.1 | 29.9 | 18.2 | 3.9 | 2.6 | 54.5 | 27.3 | 9.1 | 6.5 | 2.6 | 54.5 | 27.3 | 9.1 | 6.5 |
| Earth/Space Science: | | | | | | | | | | | | | | | |
| Astronomy | 0.0 | 81.8 | 6.5 | 7.8 | 3.9 | 3.9 | 77.9 | 7.8 | 5.2 | 5.2 | 3.9 | 77.9 | 7.8 | 7.8 | 2.6 |
| Geology | 0.0 | 80.5 | 14.3 | 0.0 | 5.2 | 5.2 | 80.5 | 9.1 | 2.6 | 2.6 | 3.9 | 81.8 | 7.8 | 2.6 | 3.9 |
| Meteorology | 0.0 | 67.5 | 19.5 | 6.5 | 6.5 | 2.6 | 66.2 | 16.9 | 10.4 | 3.9 | 3.9 | 66.2 | 18.2 | 7.8 | 3.9 |
| Oceanography | 0.0 | 79.2 | 14.3 | 3.9 | 2.6 | 1.3 | 83.1 | 10.4 | 3.9 | 1.3 | 1.3 | 83.1 | 9.1 | 3.9 | 2.6 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses using General Science in selection composite. Number of courses = 77.

# General Science Results for Courses Without GS in Composite

***Table E.11. Training Relevancy of General Science (GS) Content Areas by Skill Type for Courses without GS in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Life Science: | | | | | | | | | | | | | | | |
| Botany | 0.0 | 91.0 | 6.4 | 1.3 | 1.3 | 1.3 | 91.0 | 5.1 | 1.3 | 1.3 | 2.6 | 89.7 | 5.1 | 1.3 | 1.3 |
| Zoology | 1.3 | 85.9 | 9.0 | 2.6 | 1.3 | 1.3 | 89.7 | 5.1 | 2.6 | 1.3 | 2.6 | 89.7 | 5.1 | 1.3 | 1.3 |
| Anatomy/Physiology | 0.0 | 85.9 | 10.3 | 2.6 | 1.3 | 1.3 | 87.2 | 6.4 | 3.8 | 1.3 | 3.8 | 84.6 | 7.7 | 2.6 | 1.3 |
| Ecology | 0.0 | 65.4 | 25.6 | 5.1 | 3.8 | 1.3 | 65.4 | 24.4 | 5.1 | 3.8 | 2.6 | 65.4 | 24.4 | 5.1 | 2.6 |
| Physical Sciences: | | | | | | | | | | | | | | | |
| Force/Motion | 0.0 | 17.9 | 24.4 | 37.2 | 20.5 | 2.6 | 20.5 | 25.6 | 33.3 | 17.9 | 1.3 | 24.4 | 25.6 | 30.8 | 17.9 |
| Energy | 1.3 | 15.4 | 24.4 | 42.3 | 16.7 | 1.3 | 16.7 | 34.6 | 32.1 | 15.4 | 1.3 | 19.2 | 34.6 | 28.2 | 16.7 |
| Fluids | 0.0 | 29.5 | 26.9 | 26.9 | 16.7 | 2.6 | 34.6 | 26.9 | 21.8 | 14.1 | 1.3 | 37.2 | 29.5 | 17.9 | 14.1 |
| Atomic Structure | 0.0 | 62.8 | 23.1 | 11.5 | 2.6 | 1.3 | 67.9 | 23.1 | 5.1 | 2.6 | 2.6 | 65.4 | 24.4 | 3.8 | 3.8 |
| Chemistry | 0.0 | 52.6 | 30.8 | 11.5 | 5.1 | 2.6 | 55.1 | 28.2 | 9.0 | 5.1 | 2.6 | 56.4 | 28.2 | 7.7 | 5.1 |
| Earth/Space Science: | | | | | | | | | | | | | | | |
| Astronomy | 1.3 | 75.6 | 16.7 | 5.1 | 1.3 | 1.3 | 75.6 | 16.7 | 5.1 | 1.3 | 1.3 | 78.2 | 15.4 | 3.8 | 1.3 |
| Geology | 0.0 | 74.4 | 17.9 | 5.1 | 2.6 | 2.6 | 78.2 | 10.3 | 6.4 | 2.6 | 1.3 | 78.2 | 12.8 | 5.1 | 2.6 |
| Meteorology | 1.3 | 53.8 | 24.4 | 16.7 | 3.8 | 1.3 | 60.3 | 20.5 | 14.1 | 3.8 | 1.3 | 59.0 | 23.1 | 11.5 | 5.1 |
| Oceanography | 0.0 | 66.7 | 17.9 | 11.5 | 3.8 | 3.8 | 67.9 | 16.7 | 7.7 | 3.8 | 2.6 | 67.9 | 14.1 | 10.3 | 5.1 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses that do not use General Science in selection composite. Number of courses = 78.

# Results Summary: Mechanical Comprehension

- For training courses requiring MC, relevancy ratings generally support most of the MC content categories, with the possible exception of “Structural Support.”
  - Results generally varied across training focus areas in expected ways (e.g., ratings for Mechanical courses were generally higher than for Electronics courses).
- MC content was generally rated to be much more relevant for those training courses requiring MC than for those that do not.

# Mechanical Comprehension Results for Courses with MC in Composite

***Table F.1. Training Relevancy of Mechanical Comprehension (MC) Content Areas by Skill Type for Courses with MC in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Mechanical Comprehension: | | | | | | | | | | | | | | | |
| Simple Machines | 1.0 | 22.0 | 26.0 | 41.0 | 10.0 | 2.0 | 26.0 | 23.0 | 41.0 | 8.0 | 2.0 | 33.0 | 25.0 | 35.0 | 5.0 |
| Basic Compound Machines | 0.0 | 23.0 | 19.0 | 42.0 | 16.0 | 1.0 | 25.0 | 20.0 | 42.0 | 12.0 | 4.0 | 28.0 | 27.0 | 26.0 | 15.0 |
| Mechanical Motion | 0.0 | 18.0 | 21.0 | 38.0 | 23.0 | 1.0 | 22.0 | 20.0 | 39.0 | 18.0 | 2.0 | 24.0 | 27.0 | 29.0 | 18.0 |
| Fluids and Gases | 0.0 | 18.0 | 22.0 | 37.0 | 23.0 | 1.0 | 21.0 | 29.0 | 33.0 | 16.0 | 1.0 | 24.0 | 31.0 | 26.0 | 18.0 |
| Properties of Materials | 0.0 | 21.0 | 27.0 | 34.0 | 18.0 | 3.0 | 25.0 | 28.0 | 31.0 | 13.0 | 2.0 | 28.0 | 25.0 | 32.0 | 13.0 |
| Structural Support | 0.0 | 54.0 | 25.0 | 14.0 | 7.0 | 1.0 | 57.0 | 20.0 | 15.0 | 7.0 | 1.0 | 57.0 | 23.0 | 11.0 | 8.0 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses using Mechanical Comprehension in selection composite. Number of courses = 100.

# Mechanical Comprehension Results for Courses Without MC in Composite

***Table F.9. Training Relevancy of Mechanical Comprehension (MC) Content Areas by Skill Type for Courses without MC in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Mechanical Comprehension: | | | | | | | | | | | | | | | |
| Simple Machines | 0.0 | 44.1 | 32.2 | 16.9 | 6.8 | 5.1 | 44.1 | 27.1 | 16.9 | 6.8 | 5.1 | 50.8 | 20.3 | 15.3 | 8.5 |
| Basic Compound Machines | 1.7 | 47.5 | 27.1 | 15.3 | 8.5 | 6.8 | 45.8 | 23.7 | 16.9 | 6.8 | 6.8 | 49.2 | 20.3 | 13.6 | 10.2 |
| Mechanical Motion | 0.0 | 45.8 | 20.3 | 22.0 | 11.9 | 3.4 | 47.5 | 15.3 | 23.7 | 10.2 | 5.1 | 49.2 | 15.3 | 15.3 | 15.3 |
| Fluids and Gases | 0.0 | 47.5 | 22.0 | 16.9 | 13.6 | 3.4 | 49.2 | 18.6 | 15.3 | 13.6 | 3.4 | 54.2 | 11.9 | 13.6 | 16.9 |
| Properties of Materials | 3.4 | 37.3 | 30.5 | 20.3 | 8.5 | 3.4 | 39.0 | 28.8 | 18.6 | 10.2 | 5.1 | 42.4 | 20.3 | 22.0 | 10.2 |
| Structural Support | 1.7 | 50.8 | 30.5 | 10.2 | 6.8 | 5.1 | 52.5 | 28.8 | 8.5 | 5.1 | 5.1 | 55.9 | 23.7 | 8.5 | 6.8 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses that do not use Mechanical Comprehension in selection composite. Number of courses = 59.

# Results Summary: Assembling Objects

- For training courses requiring AO (all of which were in the Navy), the relevancy ratings for the one AO content category (“Spatial Ability”) were generally high, although the sample size was relatively modest (k = 17)
- Except for courses in the Intelligence training focus area, the ratings for AO were also relatively high for courses not requiring AO, suggesting that this subtest may be underutilized.

# Assembling Objects Results for Courses with AO in Composite

***Table H.1. Training Relevancy of Assembling Objects (AO) Content Areas by Skill Type for Courses with AO in Composite (Service = Navy)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Assembling Objects: | | | | | | | | | | | | | | | |
| Spatial Ability | 0.0 | 5.9 | 29.4 | 29.4 | 35.3 | 0.0 | 11.8 | 29.4 | 23.5 | 35.3 | 0.0 | 11.8 | 35.3 | 17.6 | 35.3 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for Navy courses using Assembling Objects in selection composite. Number of courses = 17.

# Assembling Objects Results for Courses Without AO in Composite

***Table H.3. Training Relevancy of Assembling Objects (AO) Content Areas by Skill Type for Courses without AO in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Assembling Objects: Spatial Ability | 0.7 | 18.4 | 25.0 | 39.7 | 16.2 | 0.7 | 19.1 | 22.1 | 37.5 | 20.6 | 2.2 | 22.8 | 24.3 | 33.8 | 16.9 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses that do not use Assembling Objects in selection composite. Number of courses = 136.

# Results Summary: AFQT Quantitative Reasoning Content

- Content categories included on the survey under Quantitative Reasoning (QR) are intended to represent content on the Mathematical Knowledge (MK) and Arithmetic Reasoning (AR) subtests.
- Results generally support all QR content categories, although relevancy ratings were highest for “Numbers and Operations” and “Measurement.”
- Ratings varied across training focus areas to some extent, with ratings for Science and Engineering courses generally higher than those for other areas.

# Quantitative Reasoning Results – All Courses

***Table I.1. Training Relevancy of Quantitative Reasoning Content Areas by Skill Type (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Quantitative Reasoning: | | | | | | | | | | | | | | | |
| Numbers and Operations | 1.3 | 12.5 | 28.9 | 38.8 | 18.4 | 2.0 | 13.8 | 27.6 | 40.8 | 15.8 | 2.6 | 16.4 | 32.9 | 32.2 | 15.8 |
| Algebra and Functions | 0.0 | 27.6 | 33.6 | 27.6 | 11.2 | 1.3 | 28.3 | 32.9 | 25.7 | 11.8 | 1.3 | 29.6 | 36.8 | 20.4 | 11.8 |
| Probability and Statistics | 0.7 | 28.9 | 38.8 | 27.0 | 4.6 | 1.3 | 31.6 | 35.5 | 25.7 | 5.9 | 2.0 | 32.9 | 36.2 | 23.7 | 5.3 |
| Geometry | 0.7 | 32.2 | 35.5 | 20.4 | 11.2 | 2.0 | 34.2 | 32.9 | 21.1 | 9.9 | 2.0 | 35.5 | 33.6 | 19.7 | 9.2 |
| Measurement | 0.7 | 8.6 | 25.0 | 43.4 | 22.4 | 0.7 | 10.5 | 23.0 | 42.8 | 23.0 | 1.3 | 13.8 | 24.3 | 37.5 | 23.0 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for all courses. Number of courses = 152.

# Quantitative Reasoning Results by Training Focus Area – Science & Engineering Courses

***Table I.11. Training Relevancy of Quantitative Reasoning Content Areas by Skill Type (Training Focus Area = Science and Engineering)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Quantitative Reasoning: | | | | | | | | | | | | | | | |
| Numbers and Operations | 0.0 | 5.9 | 11.8 | 41.2 | 41.2 | 0.0 | 5.9 | 5.9 | 52.9 | 35.3 | 0.0 | 5.9 | 23.5 | 41.2 | 29.4 |
| Algebra and Functions | 0.0 | 17.6 | 23.5 | 29.4 | 29.4 | 0.0 | 17.6 | 23.5 | 23.5 | 35.3 | 0.0 | 17.6 | 35.3 | 11.8 | 35.3 |
| Probability and Statistics | 0.0 | 11.8 | 23.5 | 41.2 | 23.5 | 0.0 | 11.8 | 23.5 | 41.2 | 23.5 | 0.0 | 11.8 | 29.4 | 41.2 | 17.6 |
| Geometry | 0.0 | 17.6 | 17.6 | 29.4 | 35.3 | 0.0 | 17.6 | 11.8 | 35.3 | 35.3 | 0.0 | 17.6 | 23.5 | 29.4 | 29.4 |
| Measurement | 0.0 | 5.9 | 11.8 | 17.6 | 64.7 | 0.0 | 5.9 | 11.8 | 17.6 | 64.7 | 0.0 | 5.9 | 11.8 | 23.5 | 58.8 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level; ('.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB) for each content area. Results based on ratings for all Science and Engineering courses. Number of courses = 17.

# Results Summary: AFQT Verbal Ability Content

- Content categories included on the survey under Verbal Ability (VA) are intended to represent content on the Word Knowledge (WK) and Paragraph Comprehension (PC) subtests.
- Relevancy ratings generally support all VA content categories (and were greater than those for QR).
- Ratings varied across training focus areas to some extent, with ratings for Intelligence courses generally higher than those for other areas.

# Verbal Ability Results – All Courses

***Table J.1. Training Relevancy of Verbal Ability Content Areas by Skill Type (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Verbal Ability: | | | | | | | | | | | | | | | |
| Vocabulary | 0.7 | 3.3 | 19.7 | 47.4 | 28.9 | 0.7 | 2.6 | 24.3 | 48.0 | 24.3 | 1.3 | 5.3 | 25.7 | 45.4 | 22.4 |
| Literal Comprehension | 0.7 | 5.9 | 18.4 | 43.4 | 31.6 | 1.3 | 6.6 | 22.4 | 42.1 | 27.6 | 3.3 | 7.2 | 21.7 | 42.1 | 25.7 |
| Inferential/Critical Comprehension | 0.7 | 13.8 | 30.9 | 30.3 | 24.3 | 0.7 | 14.5 | 30.3 | 31.6 | 23.0 | 1.3 | 15.8 | 30.3 | 30.3 | 22.4 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for all courses. Number of courses = 152.

# Verbal Ability Results by Training Focus Area – Intelligence Courses

***Table J.9. Training Relevancy of Verbal Ability Content Areas by Skill Type (Training Focus Area = Intelligence)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Verbal Ability: | | | | | | | | | | | | | | | |
| Vocabulary | 9.1 | 0.0 | 9.1 | 27.3 | 54.5 | 0.0 | 0.0 | 27.3 | 27.3 | 45.5 | 9.1 | 0.0 | 27.3 | 18.2 | 45.5 |
| Literal Comprehension | 9.1 | 0.0 | 9.1 | 36.4 | 45.5 | 0.0 | 0.0 | 18.2 | 18.2 | 63.6 | 9.1 | 0.0 | 9.1 | 36.4 | 45.5 |
| Inferential/Critical Comprehension | 9.1 | 0.0 | 0.0 | 36.4 | 54.5 | 0.0 | 0.0 | 0.0 | 36.4 | 63.6 | 9.1 | 0.0 | 9.1 | 27.3 | 54.5 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level; ('.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB) for each content area. Results based on ratings for Intelligence courses using Verbal Ability in selection composite. Number of courses = 11.

# Conclusions

# Conclusions

- Results support the relevance to training performances of the vast majority of content categories included on the ASVAB.
  - The primary exception to this may be for General Science, for which only a small number of categories—primarily in the Physical Sciences—received ratings in support of their relevance to training performance.
  - Results for the Science &Technical subtests were very consistent with those from the 1997 study conducted by Oppler et al.
- Results for Assembling Objects suggest that it may be underutilized, given the relatively high relevancy ratings observed for that subtest for training courses not currently using that subtest for classification.

# Conclusions (continued)

- Results for the Cyber special test (see Appendix E) suggest that it may also be underutilized, at least for courses in some Training Focus Areas (e.g., Information Technology and Intelligence).
- Results for Computational Thinking (see Appendix F) suggest that content comprising this construct may be relevant to training performance across a wide range of training focus areas, although ratings were highest for courses in Information Technology and Intelligence.
  - All six content areas received support, with the highest ratings provided for "Problem Decomposition," "Pattern Recognition," and "Abstraction."

# DAC Guidance & Questions

- Are there suggestions regarding how DTAC should use these results as they consider contents of the Next Generation ASVAB?
- Any other comments/suggestions/questions?

# Questions?

# Appendices A through F: Abridged Results for AS, EI, GS, MC, CT, and Computational Thinking

# Appendix A:
# Abridged Results for Auto and Shop Information (AS)

# Auto and Shop Information Results for Courses with AS in Composite

***Table C.1. Training Relevancy of Auto and Shop Information (AS) Content Areas by Skill Type for Courses with AS in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Automotive Information: | | | | | | | | | | | | | | | |
| Automotive Component | 0.0 | 26.9 | 20.4 | 35.5 | 17.2 | 3.2 | 31.2 | 18.3 | 35.5 | 11.8 | 3.2 | 32.3 | 25.8 | 23.7 | 15.1 |
| Automotive Systems | 0.0 | 29.0 | 18.3 | 35.5 | 17.2 | 3.2 | 32.3 | 20.4 | 31.2 | 12.9 | 3.2 | 34.4 | 20.4 | 30.1 | 11.8 |
| Automotive Tools | 0.0 | 19.4 | 11.8 | 34.4 | 34.4 | 3.2 | 21.5 | 14.0 | 28.0 | 33.3 | 4.3 | 25.8 | 22.6 | 30.1 | 17.2 |
| Troubleshooting/Repair | 0.0 | 25.8 | 17.2 | 36.6 | 20.4 | 3.2 | 28.0 | 15.1 | 38.7 | 15.1 | 3.2 | 29.0 | 20.4 | 30.1 | 17.2 |
| Shop Information: | | | | | | | | | | | | | | | |
| Shop Tools | 1.1 | 11.8 | 11.8 | 37.6 | 37.6 | 3.2 | 9.7 | 15.1 | 35.5 | 36.6 | 4.3 | 15,.1 | 23.7 | 30.1 | 26.9 |
| Building Materials | 1.1 | 37.6 | 24.7 | 23.7 | 12.9 | 4.3 | 39.8 | 18.3 | 24.7 | 12.9 | 4.3 | 41.9 | 19.4 | 26.9 | 7.5 |
| Building/Construction Procedures | 1.1 | 43.0 | 30.1 | 18.3 | 7.5 | 4.3 | 44.1 | 24.7 | 20.4 | 6.5 | 4.3 | 50.5 | 21.5 | 20.4 | 3.2 |

*Note.* Ratings represent the average percentage (rounded to nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses using Auto and Shop Information in selection composite. Number of courses = 93.

# Auto and Shop Information Results by Training Focus Area – Mechanical Courses

***Table C.7. Training Relevancy of Auto and Shop Information (AS) Content Areas by Skill Type for Courses with AS in Composite (Training Focus Area = Mechanical)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Automotive Information: | | | | | | | | | | | | | | | |
| Automotive Component | 0.0 | 22.6 | 21.0 | 43.5 | 12.9 | 3.2 | 25.8 | 19.4 | 40.3 | 11.3 | 3.2 | 30.6 | 27.4 | 22.6 | 16.1 |
| Automotive Systems | 0.0 | 25.8 | 14.5 | 45.2 | 14.5 | 3.2 | 27.4 | 21.0 | 35.5 | 12.9 | 3.2 | 30.6 | 21.0 | 32.3 | 12.9 |
| Automotive Tools | 0.0 | 14.5 | 11.3 | 35.5 | 38.7 | 3.2 | 16.1 | 12.9 | 29.0 | 38.7 | 4.8 | 19.4 | 24.2 | 30.6 | 21.0 |
| Troubleshooting/Repair | 0.0 | 25.8 | 16.1 | 41.9 | 16.1 | 3.2 | 29.0 | 11.3 | 43.5 | 12.9 | 3.2 | 29.0 | 21.0 | 32.3 | 14.5 |
| Shop Information: | | | | | | | | | | | | | | | |
| Shop Tools | 0.0 | 6.5 | 14.5 | 35.5 | 43.5 | 3.2 | 6.5 | 16.1 | 32.3 | 41.9 | 3.2 | 9.7 | 29.0 | 27.4 | 30.6 |
| Building Materials | 0.0 | 37.1 | 27.4 | 22.6 | 12.9 | 4.8 | 40.3 | 19.4 | 22.6 | 12.9 | 3.2 | 43.5 | 21.0 | 24.2 | 8.1 |
| Building/Construction Procedures | 0.0 | 43.5 | 33.9 | 17.7 | 5.5 | 4.8 | 46.8 | 24.2 | 21.0 | 3.2 | 4.8 | 53.2 | 21.0 | 19.4 | 1.6 |

*Note.* Ratings represent the average percentage (rounded to nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for Mechanical courses using Auto and Shop Information in selection composite. Number of courses = 62.

# Auto and Shop Information Results by Training Focus Area – Electronics Courses

***Table C.6. Training Relevancy of Auto and Shop Information (AS) Content Areas by Skill Type for Courses with AS in Composite (Training Focus Area = Electronics)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Automotive Information: | | | | | | | | | | | | | | | |
| Automotive Component | 0.0 | 37.5 | 25.0 | 25.0 | 12.5 | 6.3 | 43.8 | 18.8 | 25.0 | 6.3 | 6.3 | 37.5 | 25.0 | 18.8 | 12.5 |
| Automotive Systems | 0.0 | 37.5 | 31.3 | 18.8 | 12.5 | 6.3 | 37.5 | 18.8 | 31.3 | 6.3 | 6.3 | 37.5 | 25.0 | 25.0 | 6.3 |
| Automotive Tools | 0.0 | 31.3 | 6.3 | 43.8 | 18.8 | 6.3 | 25.0 | 12.5 | 31.3 | 25.0 | 6.3 | 31.3 | 25.0 | 25.0 | 12.5 |
| Troubleshooting/Repair | 0.0 | 31.3 | 25.0 | 25.0 | 18.8 | 6.3 | 25.0 | 25.0 | 31.3 | 12.5 | 6.3 | 25.0 | 25.0 | 25.0 | 18.8 |
| Shop Information: | | | | | | | | | | | | | | | |
| Shop Tools | 0.0 | 18.8 | 6.3 | 50.0 | 25.0 | 0.0 | 18.8 | 6.3 | 43.8 | 31.3 | 0.0 | 25.0 | 12.5 | 37.5 | 25.0 |
| Building Materials | 0.0 | 25.0 | 37.5 | 25.0 | 12.5 | 0.0 | 31.3 | 25.0 | 31.3 | 12.5 | 6.3 | 31.3 | 25.0 | 31.3 | 6.3 |
| Building/Construction Procedures | 0.0 | 31.3 | 37.5 | 18.8 | 12.5 | 0.0 | 31.3 | 37.5 | 18.8 | 12.5 | 0.0 | 37.5 | 31.3 | 25.0 | 6.3 |

*Note.* Ratings represent the average percentage (rounded to nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for Electronics courses using Auto and Shop information in selection composite. Number of courses = 16.

# Auto and Shop Information Results for Courses Without AS in Composite

***Table C.9. Training Relevancy of Auto and Shop Information (AS) Content Areas by Skill Type for Courses without AS in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Automotive Information: | | | | | | | | | | | | | | | |
| Automotive Component | 0.0 | 59.7 | 28.4 | 4.5 | 7.5 | 3.0 | 62.7 | 23.9 | 3.0 | 7.5 | 3.0 | 67.2 | 13.4 | 10.4 | 6.0 |
| Automotive Systems | 0.0 | 61.2 | 22.4 | 10.4 | 6.0 | 3.0 | 64.2 | 20.9 | 6.0 | 6.0 | 3.0 | 65.7 | 14.9 | 10.4 | 6.0 |
| Automotive Tools | 0.0 | 56.7 | 22.4 | 9.0 | 11.9 | 3.0 | 59.7 | 16.4 | 13.4 | 7.5 | 3.0 | 59.7 | 16.4 | 11.9 | 9.0 |
| Troubleshooting/Repair | 0.0 | 62.7 | 19.4 | 11.9 | 6.0 | 3.0 | 61.2 | 16.4 | 11.9 | 7.5 | 3.0 | 58.2 | 17.9 | 11.9 | 9.0 |
| Shop Information: | | | | | | | | | | | | | | | |
| Shop Tools | 0.0 | 50.7 | 20.9 | 22.4 | 6.0 | 3.0 | 50.7 | 19.4 | 20.9 | 6.0 | 1.5 | 52.2 | 20.9 | 20.9 | 4.5 |
| Building Materials | 1.5 | 62.7 | 19.4 | 11.9 | 4.5 | 1.5 | 61.2 | 22.4 | 10.4 | 4.5 | 4.5 | 59.7 | 16.4 | 14.9 | 4.5 |
| Building/Construction Procedures | 0.0 | 59.7 | 25.4 | 9.0 | 6.0 | 1.5 | 61.2 | 22.4 | 10.4 | 4.5 | 1.5 | 61.2 | 17.9 | 14.9 | 4.5 |

*Note.* Ratings represent the average percentage (rounded to nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses that do not use Auto and Shop Information in selection composite. Number of courses = 67.

# Appendix B:
# Abridged Results for Electronics Information (EI)

# Electronics Information Results for Courses with EI in Composite

***Table D.1. Training Relevance of Electronics Information (EI) Content Areas by Skill Type for Courses with EI in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Electronics Information: | | | | | | | | | | | | | | | |
| Electrical Tools, Devices, and Materials | 1.3 | 10.0 | 17.5 | 22.5 | 48.8 | 3.8 | 11.3 | 13.8 | 21.3 | 50.0 | 3.8 | 12.5 | 15.0 | 22.5 | 46.3 |
| Electrical Circuits | 0.0 | 10.0 | 16.3 | 20.0 | 53.8 | 2.5 | 12.5 | 12.5 | 23.8 | 48.8 | 2.5 | 15.0 | 12.5 | 26.3 | 43.8 |
| Electricity/Electronic Systems | 0.0 | 11.3 | 21.3 | 16.3 | 51.3 | 1.3 | 13.8 | 16.3 | 26.3 | 42.5 | 1.3 | 15.0 | 13.8 | 28.8 | 41.3 |
| Electrical Current | 1.3 | 12.5 | 16.3 | 21.3 | 48.8 | 1.3 | 13.8 | 16.3 | 23.8 | 45.0 | 1.3 | 13.8 | 16.3 | 26.3 | 42.5 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses using Electronics Information in selection composite. Number of courses = 80.

# Electronics Information Results by Training Focus Area – Electronics Courses

***Table D.7. Training Relevancy of Electronics Information (EI) Content Areas by Skill Type for Courses with EI in Composite (Training Focus Area = Electronics)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Electronics Information: | | | | | | | | | | | | | | | |
| Electrical Tools, Devices, and Materials | 0.0 | 3.0 | 9.1 | 18.2 | 69.7 | 0.0 | 3.0 | 12.1 | 15.2 | 69.7 | 0.0 | 3.0 | 12.1 | 15.2 | 69.7 |
| Electrical Circuits | 0.0 | 6.1 | 6.1 | 15.2 | 72.7 | 0.0 | 9.1 | 9.1 | 12.1 | 69.7 | 0.0 | 12.1 | 6.1 | 18.2 | 63.6 |
| Electricity/Electronic Systems | 0.0 | 3.0 | 6.1 | 15.2 | 75.8 | 0.0 | 6.1 | 3.0 | 27.3 | 63.6 | 0.0 | 6.1 | 6.1 | 24.2 | 63.6 |
| Electrical Current | 0.0 | 3.0 | 9.1 | 18.2 | 69.7 | 0.0 | 3.0 | 12.1 | 18.2 | 66.7 | 0.0 | 3.0 | 12.1 | 24.2 | 60.6 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for Electronics courses using Electronics Information in selection composite. Number of courses = 33.

# Electronics Information Results by Training Focus Area – Mechanical Courses

***Table D.8. Training Relevancy of Electronics Information (EI) Content Areas by Skill Type for Courses with EI in Composite (Training Focus Area = Mechanical)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Electronics Information: | | | | | | | | | | | | | | | |
| Electrical Tools, Devices, and Materials | 3.2 | 12.9 | 22.6 | 29.0 | 32.3 | 6.5 | 12.9 | 12.9 | 29.0 | 38.7 | 6.5 | 16.1 | 16.1 | 35.5 | 25.8 |
| Electrical Circuits | 0 | 12.9 | 19.4 | 25.8 | 41.9 | 3.2 | 12.9 | 12.9 | 35.5 | 35.5 | 3.2 | 16.1 | 12.9 | 35.5 | 32.3 |
| Electricity/Electronic Systems | 0 | 19.4 | 32.3 | 12.9 | 35.5 | 3.2 | 19.4 | 25.8 | 25.8 | 25.8 | 3.2 | 22.6 | 19.4 | 29.0 | 25.8 |
| Electrical Current | 3.2 | 16.1 | 19.4 | 22.6 | 38.7 | 3.2 | 19.4 | 16.1 | 29.0 | 32.3 | 3.2 | 19.4 | 16.1 | 25.8 | 35.5 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for Mechanical courses using Electronics Information in selection composite. Number of courses = 31.

# Electronics Information Results for Courses Without EI in Composite

***Table D.10. Training Relevancy of Electronics Information (EI) Content Areas by Skill Type for Courses without EI in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Electronics Information: | | | | | | | | | | | | | | | |
| Electrical Tools, Devices, and Materials | 0.0 | 26.0 | 23.4 | 36.4 | 14.3 | 1.3 | 26.0 | 27.3 | 29.9 | 15.6 | 1.3 | 33.8 | 29.9 | 20.8 | 14.3 |
| Electrical Circuits | 2.6 | 24.7 | 32.5 | 24.7 | 15.6 | 1.3 | 27.3 | 31.2 | 27.3 | 13.0 | 2.6 | 32.5 | 29.9 | 22.1 | 13.0 |
| Electricity/Electronic Systems | 1.3 | 23.4 | 23.4 | 26.0 | 26.0 | 0.0 | 26.0 | 24.7 | 28.6 | 20.8 | 1.3 | 29.9 | 26.0 | 20.8 | 22.1 |
| Electrical Current | 0.0 | 31.2 | 24.7 | 23.4 | 20.8 | 1.3 | 32.5 | 27.3 | 20.8 | 18.2 | 1.3 | 33.8 | 26.0 | 22.1 | 16.9 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses that do not use Electronics Information in selection composite. Number of courses = 77.

# Appendix C:
# Abridged Results for General Science (GS)

# General Science Results for Courses with GS in Composite

***Table E.1. Training Relevancy of General Science (GS) Content Areas by Skill Type for Courses with GS in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Life Science: | | | | | | | | | | | | | | | |
| Botany | 0.0 | 88.3 | 7.8 | 3.9 | 0.0 | 2.6 | 84.4 | 9.1 | 2.6 | 1.3 | 2.6 | 87.0 | 6.5 | 2.6 | 1.3 |
| Zoology | 0.0 | 87.0 | 9.1 | 2.6 | 1.3 | 2.6 | 85.7 | 7.8 | 1.3 | 2.6 | 2.6 | 87.0 | 6.5 | 1.3 | 2.6 |
| Anatomy/Physiology | 0.0 | 85.7 | 6.5 | 3.9 | 3.9 | 2.6 | 84.4 | 5.2 | 3.9 | 3.9 | 2.6 | 84.4 | 6.5 | 2.6 | 3.9 |
| Ecology | 0.0 | 68.8 | 23.4 | 6.5 | 1.3 | 2.6 | 71.4 | 22.1 | 2.6 | 1.3 | 2.6 | 71.4 | 19.5 | 5.2 | 1.3 |
| Physical Sciences: | | | | | | | | | | | | | | | |
| Force/Motion | 0.0 | 20.8 | 28.6 | 33.8 | 16.9 | 2.6 | 19.5 | 26.0 | 36.4 | 15.6 | 2.6 | 20.8 | 27.3 | 36.4 | 13.0 |
| Energy | 0.0 | 15.6 | 24.7 | 37.7 | 22.1 | 2.6 | 15.6 | 27.3 | 35.1 | 19.5 | 2.6 | 15.6 | 29.9 | 32.5 | 19.5 |
| Fluids | 0.0 | 33.8 | 31.2 | 19.5 | 15.6 | 2.6 | 35.1 | 29.9 | 19.5 | 13.0 | 2.6 | 36.4 | 32.5 | 16.9 | 11.7 |
| Atomic Structure | 0.0 | 58.4 | 22.1 | 13.0 | 6.5 | 2.6 | 61.0 | 23.4 | 7.8 | 5.2 | 3.9 | 59.7 | 23.4 | 7.8 | 5.2 |
| Chemistry | 0.0 | 48.1 | 29.9 | 18.2 | 3.9 | 2.6 | 54.5 | 27.3 | 9.1 | 6.5 | 2.6 | 54.5 | 27.3 | 9.1 | 6.5 |
| Earth/Space Science: | | | | | | | | | | | | | | | |
| Astronomy | 0.0 | 81.8 | 6.5 | 7.8 | 3.9 | 3.9 | 77.9 | 7.8 | 5.2 | 5.2 | 3.9 | 77.9 | 7.8 | 7.8 | 2.6 |
| Geology | 0.0 | 80.5 | 14.3 | 0.0 | 5.2 | 5.2 | 80.5 | 9.1 | 2.6 | 2.6 | 3.9 | 81.8 | 7.8 | 2.6 | 3.9 |
| Meteorology | 0.0 | 67.5 | 19.5 | 6.5 | 6.5 | 2.6 | 66.2 | 16.9 | 10.4 | 3.9 | 3.9 | 66.2 | 18.2 | 7.8 | 3.9 |
| Oceanography | 0.0 | 79.2 | 14.3 | 3.9 | 2.6 | 1.3 | 83.1 | 10.4 | 3.9 | 1.3 | 1.3 | 83.1 | 9.1 | 3.9 | 2.6 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses using General Science in selection composite. Number of courses = 77.

# General Science Results by Training Focus Area – Science and Engineering Courses

***Table E.10. Training Relevancy of General Science (GS) Content Areas by Skill Type for Courses with GS in Composite (Training Focus Area = Science and Engineering)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Life Science: | | | | | | | | | | | | | | | |
| Botany | 0.0 | 63.6 | 18.2 | 18.2 | 0.0 | 0.0 | 63.6 | 18.2 | 9.1 | 9.1 | 0.0 | 81.8 | 0.0 | 9.1 | 9.1 |
| Zoology | 0.0 | 63.6 | 18.2 | 18.2 | 0.0 | 0.0 | 72.7 | 9.1 | 9.1 | 9.1 | 0.0 | 81.8 | 0.0 | 9.1 | 9.1 |
| Anatomy/Physiology | 0.0 | 45.5 | 9.1 | 18.2 | 27.3 | 0.0 | 54.5 | 0.0 | 18.2 | 27.3 | 0.0 | 54.5 | 9.1 | 9.1 | 27.3 |
| Ecology | 0.0 | 45.5 | 27.3 | 27.3 | 0.0 | 0.0 | 54.5 | 18.2 | 18.2 | 9.1 | 0.0 | 54.5 | 18.2 | 18.2 | 9.1 |
| Physical Sciences: | | | | | | | | | | | | | | | |
| Force/Motion | 0.0 | 27.3 | 27.3 | 36.4 | 9.1 | 0.0 | 18.2 | 27.3 | 36.4 | 18.2 | 0.0 | 18.2 | 27.3 | 36.4 | 18.2 |
| Energy | 0.0 | 27.3 | 36.4 | 27.3 | 9.1 | 0.0 | 18.2 | 36.4 | 27.3 | 18.2 | 0.0 | 18.2 | 27.3 | 36.4 | 18.2 |
| Fluids | 0.0 | 9.1 | 27.3 | 18.2 | 45.5 | 0.0 | 0.0 | 45.5 | 18.2 | 36.4 | 0.0 | 0.0 | 45.5 | 18.2 | 36.4 |
| Atomic Structure | 0.0 | 54.5 | 18.2 | 9.1 | 18.2 | 0.0 | 45.5 | 18.2 | 18.2 | 18.2 | 9.1 | 36.4 | 18.2 | 18.2 | 18.2 |
| Chemistry | 0.0 | 27.3 | 18.2 | 27.3 | 27.3 | 0.0 | 36.4 | 18.2 | 0 | 45.5 | 0.0 | 36.4 | 18.2 | 0 | 45.5 |
| Earth/Space Science: | | | | | | | | | | | | | | | |
| Astronomy | 0.0 | 81.8 | 9.1 | 9.1 | 0.0 | 0.0 | 72.7 | 18.2 | 9.1 | 0.0 | 0.0 | 72.7 | 9.1 | 18.2 | 0.0 |
| Geology | 0.0 | 72.7 | 9.1 | 0.0 | 18.2 | 0.0 | 63.6 | 18.2 | 18.2 | 0.0 | 0.0 | 63.6 | 9.1 | 18.2 | 9.1 |
| Meteorology | 0.0 | 72.7 | 18.2 | 0.0 | 9.1 | 0.0 | 63.6 | 27.3 | 9.1 | 0.0 | 0.0 | 63.6 | 18.2 | 18.2 | 0.0 |
| Oceanography | 0.0 | 72.7 | 18.2 | 9.1 | 0.0 | 0.0 | 63.6 | 27.3 | 9.1 | 0.0 | 0.0 | 63.6 | 18.2 | 18.2 | 0.0 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for Science and Engineering courses using General Science in selection composite. Number of courses = 11.

# General Science Results for Courses Without GS in Composite

***Table E.11. Training Relevancy of General Science (GS) Content Areas by Skill Type for Courses without GS in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Life Science: | | | | | | | | | | | | | | | |
| Botany | 0.0 | 91.0 | 6.4 | 1.3 | 1.3 | 1.3 | 91.0 | 5.1 | 1.3 | 1.3 | 2.6 | 89.7 | 5.1 | 1.3 | 1.3 |
| Zoology | 1.3 | 85.9 | 9.0 | 2.6 | 1.3 | 1.3 | 89.7 | 5.1 | 2.6 | 1.3 | 2.6 | 89.7 | 5.1 | 1.3 | 1.3 |
| Anatomy/Physiology | 0.0 | 85.9 | 10.3 | 2.6 | 1.3 | 1.3 | 87.2 | 6.4 | 3.8 | 1.3 | 3.8 | 84.6 | 7.7 | 2.6 | 1.3 |
| Ecology | 0.0 | 65.4 | 25.6 | 5.1 | 3.8 | 1.3 | 65.4 | 24.4 | 5.1 | 3.8 | 2.6 | 65.4 | 24.4 | 5.1 | 2.6 |
| Physical Sciences: | | | | | | | | | | | | | | | |
| Force/Motion | 0.0 | 17.9 | 24.4 | 37.2 | 20.5 | 2.6 | 20.5 | 25.6 | 33.3 | 17.9 | 1.3 | 24.4 | 25.6 | 30.8 | 17.9 |
| Energy | 1.3 | 15.4 | 24.4 | 42.3 | 16.7 | 1.3 | 16.7 | 34.6 | 32.1 | 15.4 | 1.3 | 19.2 | 34.6 | 28.2 | 16.7 |
| Fluids | 0.0 | 29.5 | 26.9 | 26.9 | 16.7 | 2.6 | 34.6 | 26.9 | 21.8 | 14.1 | 1.3 | 37.2 | 29.5 | 17.9 | 14.1 |
| Atomic Structure | 0.0 | 62.8 | 23.1 | 11.5 | 2.6 | 1.3 | 67.9 | 23.1 | 5.1 | 2.6 | 2.6 | 65.4 | 24.4 | 3.8 | 3.8 |
| Chemistry | 0.0 | 52.6 | 30.8 | 11.5 | 5.1 | 2.6 | 55.1 | 28.2 | 9.0 | 5.1 | 2.6 | 56.4 | 28.2 | 7.7 | 5.1 |
| Earth/Space Science: | | | | | | | | | | | | | | | |
| Astronomy | 1.3 | 75.6 | 16.7 | 5.1 | 1.3 | 1.3 | 75.6 | 16.7 | 5.1 | 1.3 | 1.3 | 78.2 | 15.4 | 3.8 | 1.3 |
| Geology | 0.0 | 74.4 | 17.9 | 5.1 | 2.6 | 2.6 | 78.2 | 10.3 | 6.4 | 2.6 | 1.3 | 78.2 | 12.8 | 5.1 | 2.6 |
| Meteorology | 1.3 | 53.8 | 24.4 | 16.7 | 3.8 | 1.3 | 60.3 | 20.5 | 14.1 | 3.8 | 1.3 | 59.0 | 23.1 | 11.5 | 5.1 |
| Oceanography | 0.0 | 66.7 | 17.9 | 11.5 | 3.8 | 3.8 | 67.9 | 16.7 | 7.7 | 3.8 | 2.6 | 67.9 | 14.1 | 10.3 | 5.1 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses that do not use General Science in selection composite. Number of courses = 78.

# Appendix D:
# Abridged Results for Mechanical Comprehension (MC)

# Mechanical Comprehension Results for Courses with MC in Composite

***Table F.1. Training Relevancy of Mechanical Comprehension (MC) Content Areas by Skill Type for Courses with MC in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Mechanical Comprehension: | | | | | | | | | | | | | | | |
| Simple Machines | 1.0 | 22.0 | 26.0 | 41.0 | 10.0 | 2.0 | 26.0 | 23.0 | 41.0 | 8.0 | 2.0 | 33.0 | 25.0 | 35.0 | 5.0 |
| Basic Compound Machines | 0.0 | 23.0 | 19.0 | 42.0 | 16.0 | 1.0 | 25.0 | 20.0 | 42.0 | 12.0 | 4.0 | 28.0 | 27.0 | 26.0 | 15.0 |
| Mechanical Motion | 0.0 | 18.0 | 21.0 | 38.0 | 23.0 | 1.0 | 22.0 | 20.0 | 39.0 | 18.0 | 2.0 | 24.0 | 27.0 | 29.0 | 18.0 |
| Fluids and Gases | 0.0 | 18.0 | 22.0 | 37.0 | 23.0 | 1.0 | 21.0 | 29.0 | 33.0 | 16.0 | 1.0 | 24.0 | 31.0 | 26.0 | 18.0 |
| Properties of Materials | 0.0 | 21.0 | 27.0 | 34.0 | 18.0 | 3.0 | 25.0 | 28.0 | 31.0 | 13.0 | 2.0 | 28.0 | 25.0 | 32.0 | 13.0 |
| Structural Support | 0.0 | 54.0 | 25.0 | 14.0 | 7.0 | 1.0 | 57.0 | 20.0 | 15.0 | 7.0 | 1.0 | 57.0 | 23.0 | 11.0 | 8.0 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses using Mechanical Comprehension in selection composite. Number of courses = 100.

# Mechanical Comprehension Results by Training Focus Area – Electronics Courses

***Table F.6. Training Relevancy of Mechanical Comprehension (MC) Content Areas by Skill Type for Courses with MC in Composite (Training Focus Area = Electronics)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Mechanical Comprehension: | | | | | | | | | | | | | | | |
| Simple Machines | 0 | 41.7 | 20.8 | 33.3 | 4.2 | 0 | 50 | 16.7 | 29.2 | 4.2 | 0 | 45.8 | 20.8 | 29.2 | 4.2 |
| Basic Compound Machines | 0 | 50 | 12.5 | 33.3 | 4.2 | 0 | 50 | 16.7 | 29.2 | 4.2 | 4.2 | 50 | 20.8 | 20.8 | 4.2 |
| Mechanical Motion | 0 | 33.3 | 16.7 | 41.7 | 8.3 | 0 | 41.7 | 12.5 | 37.5 | 8.3 | 0 | 37.5 | 20.8 | 29.2 | 12.5 |
| Fluids and Gases | 0 | 33.3 | 33.3 | 20.8 | 12.5 | 0 | 37.5 | 33.3 | 20.8 | 8.3 | 0 | 41.7 | 25.0 | 16.7 | 16.7 |
| Properties of Materials | 0 | 41.7 | 4.2 | 45.8 | 8.3 | 4.2 | 41.7 | 16.7 | 29.2 | 8.3 | 0 | 41.7 | 16.7 | 33.3 | 8.3 |
| Structural Support | 0 | 70.8 | 12.5 | 12.5 | 4.2 | 0 | 75 | 12.5 | 8.3 | 4.2 | 0 | 75 | 12.5 | 8.3 | 4.2 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for Electronics courses using Mechanical Comprehension in selection composite. Number of courses = 24.

# Mechanical Comprehension Results by Training Focus Area – Mechanical Courses

***Table F.7. Training Relevancy of Mechanical Comprehension (MC) Content Areas by Skill Type for Courses with MC in Composite (Training Focus Area = Mechanical)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Mechanical Comprehension: | | | | | | | | | | | | | | | |
| Simple Machines | 1.6 | 13.1 | 26.2 | 45.9 | 13.1 | 3.3 | 14.8 | 23.0 | 49.2 | 9.8 | 3.3 | 24.6 | 26.2 | 41.0 | 4.9 |
| Basic Compound Machines | 0.0 | 9.8 | 23.0 | 47.5 | 19.7 | 1.6 | 11.5 | 21.3 | 52.5 | 13.1 | 4.9 | 16.4 | 29.5 | 31.1 | 18.0 |
| Mechanical Motion | 0.0 | 9.8 | 21.3 | 42.6 | 26.2 | 1.6 | 11.5 | 21.3 | 45.9 | 19.7 | 1.6 | 16.4 | 29.5 | 31.1 | 21.3 |
| Fluids and Gases | 0.0 | 9.8 | 16.4 | 47.5 | 26.2 | 1.6 | 11.5 | 27.9 | 41.0 | 18.0 | 1.6 | 14.8 | 34.4 | 31.1 | 18.0 |
| Properties of Materials | 0.0 | 8.2 | 37.7 | 34.4 | 19.7 | 3.3 | 13.1 | 36.1 | 34.4 | 13.1 | 3.3 | 18.0 | 31.1 | 34.4 | 13.1 |
| Structural Support | 0.0 | 49.2 | 32.8 | 13.1 | 4.9 | 1.6 | 50.8 | 26.2 | 16.4 | 4.9 | 1.6 | 52.5 | 29.5 | 9.8 | 6.6 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for Mechanical courses using Mechanical Comprehension in selection composite. Number of courses = 61.

# Mechanical Comprehension Results for Courses Without MC in Composite

***Table F.9. Training Relevancy of Mechanical Comprehension (MC) Content Areas by Skill Type for Courses without MC in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Mechanical Comprehension: | | | | | | | | | | | | | | | |
| Simple Machines | 0.0 | 44.1 | 32.2 | 16.9 | 6.8 | 5.1 | 44.1 | 27.1 | 16.9 | 6.8 | 5.1 | 50.8 | 20.3 | 15.3 | 8.5 |
| Basic Compound Machines | 1.7 | 47.5 | 27.1 | 15.3 | 8.5 | 6.8 | 45.8 | 23.7 | 16.9 | 6.8 | 6.8 | 49.2 | 20.3 | 13.6 | 10.2 |
| Mechanical Motion | 0.0 | 45.8 | 20.3 | 22.0 | 11.9 | 3.4 | 47.5 | 15.3 | 23.7 | 10.2 | 5.1 | 49.2 | 15.3 | 15.3 | 15.3 |
| Fluids and Gases | 0.0 | 47.5 | 22.0 | 16.9 | 13.6 | 3.4 | 49.2 | 18.6 | 15.3 | 13.6 | 3.4 | 54.2 | 11.9 | 13.6 | 16.9 |
| Properties of Materials | 3.4 | 37.3 | 30.5 | 20.3 | 8.5 | 3.4 | 39.0 | 28.8 | 18.6 | 10.2 | 5.1 | 42.4 | 20.3 | 22.0 | 10.2 |
| Structural Support | 1.7 | 50.8 | 30.5 | 10.2 | 6.8 | 5.1 | 52.5 | 28.8 | 8.5 | 5.1 | 5.1 | 55.9 | 23.7 | 8.5 | 6.8 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for courses that do not use Mechanical Comprehension in selection composite. Number of courses = 59.

# Appendix E:
# Abridged Results for Cyber Test (CT)

# Cyber Test Results for Courses with Cyber in Composite Courses

***Table G.1. Training Relevancy of Cyber Test (CT) Content Areas by Skill Type for Courses with CT in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Cyber Test: | | | | | | | | | | | | | | | |
| Networking and Communications | 7.7 | 0.0 | 7.7 | 23.1 | 61.5 | 0.0 | 0.0 | 0.0 | 23.1 | 76.9 | 7.7 | 0.0 | 0.0 | 30.8 | 61.5 |
| Computer Operations | 7.7 | 0.0 | 7.7 | 38.5 | 46.2 | 0.0 | 0.0 | 7.7 | 23.1 | 69.2 | 7.7 | 0.0 | 7.7 | 23.1 | 61.5 |
| Security and Compliance | 7.7 | 0.0 | 7.7 | 30.8 | 53.8 | 0.0 | 0.0 | 0.0 | 38.5 | 61.5 | 7.7 | 7.7 | 0.0 | 30.8 | 53.8 |
| Software Programming and Web Design | 7.7 | 0.0 | 7.7 | 15.4 | 69.2 | 0.0 | 0.0 | 0.0 | 30.8 | 69.2 | 7.7 | 7.7 | 0.0 | 23.1 | 61.5 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level; ('.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB) for each content area. Results based on ratings for courses using Cyber Information in selection composite. Number of courses = 13.

# Cyber Test Results by Training Focus Area – Information Technology Courses

***Table G.3. Training Relevancy of Cyber Test (CT) Content Areas by Skill Type for Courses with CT in Composite (Training Focus Area = Information Technology)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Cyber Test: | | | | | | | | | | | | | | | |
| Networking and Communications | 0.0 | 0.0 | 0.0 | 14.3 | 85.7 | 0.0 | 0.0 | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | 28.6 | 71.4 |
| Computer Operations | 0.0 | 0.0 | 0.0 | 28.6 | 71.4 | 0.0 | 0.0 | 0.0 | 14.3 | 85.7 | 0.0 | 0.0 | 0.0 | 28.6 | 71.4 |
| Security and Compliance | 0.0 | 0.0 | 0.0 | 14.3 | 85.7 | 0.0 | 0.0 | 0.0 | 28.6 | 71.4 | 0.0 | 14.3 | 0.0 | 14.3 | 71.4 |
| Software Programming and Web Design | 0.0 | 0.0 | 0.0 | 14.3 | 85.7 | 0.0 | 0.0 | 0.0 | 14.3 | 85.7 | 0.0 | 14.3 | 0.0 | 14.3 | 71.4 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level; ('.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB) for each content area. Results based on ratings for Information Technology courses using Mechanical Comprehension in selection composite. Number of courses = 7.

# Cyber Test Results by Training Focus Area – Intelligence Courses

***Table G.4. Training Relevancy of Cyber Test (CT) Content Areas by Skill Type for Courses with CT in Composite (Training Focus Area = Intelligence)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Cyber Test: | | | | | | | | | | | | | | | |
| Networking and Communications | 16.7 | 0.0 | 16.7 | 33.3 | 33.3 | 0.0 | 0.0 | 0.0 | 50.0 | 50.0 | 16.7 | 0.0 | 0.0 | 33.3 | 50.0 |
| Computer Operations | 16.7 | 0.0 | 16.7 | 50.0 | 16.7 | 0.0 | 0.0 | 16.7 | 33.3 | 50.0 | 16.7 | 0.0 | 16.7 | 16.7 | 50.0 |
| Security and Compliance | 16.7 | 0.0 | 16.7 | 50.0 | 16.7 | 0.0 | 0.0 | 0.0 | 50.0 | 50.0 | 16.7 | 0.0 | 0.0 | 50.0 | 33.3 |
| Software Programming and Web Design | 16.7 | 0.0 | 16.7 | 16.7 | 50.0 | 0.0 | 0.0 | 0.0 | 50.0 | 50.0 | 16.7 | 0.0 | 0.0 | 33.3 | 50.0 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level; ('.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB) for each content area. Results based on ratings for Intelligence courses using Mechanical Comprehension in selection composite. Number of courses = 6.

# Cyber Test Results for Courses Without Cyber in Composite

***Table G.5. Training Relevancy of Cyber Test (CT) Content Areas by Skill Type for Courses without CT in Composite (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Cyber Test: | | | | | | | | | | | | | | | |
| Networking and Communications | 0.0 | 43.0 | 22.5 | 21.1 | 13.4 | 0.7 | 43.0 | 25.4 | 19.0 | 12.0 | 0.7 | 46.5 | 24.6 | 16.2 | 12.0 |
| Computer Operations | 0.0 | 30.3 | 25.4 | 25.4 | 19.0 | 0.7 | 31.0 | 26.1 | 22.5 | 19.7 | 0.7 | 32.4 | 33.8 | 16.2 | 16.9 |
| Security and Compliance | 0.0 | 50.0 | 20.4 | 18.3 | 11.3 | 0.7 | 49.3 | 23.2 | 16.2 | 10.6 | 0.7 | 51.4 | 25.4 | 12.0 | 9.9 |
| Software Programming and Web Design | 0.0 | 55.6 | 23.2 | 11.3 | 9.9 | 0.7 | 57.0 | 23.2 | 8.5 | 10.6 | 0.7 | 57.7 | 22.5 | 9.2 | 9.9 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level; ('.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB) for each content area. Results based on ratings for courses that do not use Cyber Information in selection composite. Number of courses = 142.

# Cyber Test Results by Training Focus Area – Information Technology Courses Without Cyber in Composite

***Table G.12. Training Relevancy of Cyber Test (CT) Content Areas by Skill Type for Courses without CT in Composite (Training Focus Area = Information Technology)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Cyber Test: | | | | | | | | | | | | | | | |
| Networking and Communications | 0.0 | 14.3 | 0.0 | 42.9 | 42.9 | 0.0 | 14.3 | 0.0 | 42.9 | 42.9 | 0.0 | 14.3 | 0.0 | 42.9 | 42.9 |
| Computer Operations | 0.0 | 0.0 | 14.3 | 28.6 | 57.1 | 0.0 | 0.0 | 14.3 | 28.6 | 57.1 | 0.0 | 0.0 | 14.3 | 42.9 | 42.9 |
| Security and Compliance | 0.0 | 14.3 | 28.6 | 28.6 | 28.6 | 0.0 | 14.3 | 28.6 | 28.6 | 28.6 | 14.3 | 14.3 | 28.6 | 14.3 | 28.6 |
| Software Programming and Web Design | 0.0 | 0.0 | 14.3 | 57.1 | 28.6 | 0.0 | 0.0 | 14.3 | 57.1 | 28.6 | 0.0 | 0.0 | 0.0 | 71.4 | 28.6 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level; ('.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB) for each content area. Results based on ratings for Information Technology courses that do not use Mechanical Comprehension in selection composite. Number of courses = 7.

# Cyber Test Results by Training Focus Area – Intelligence Courses Without Cyber in Composite

***Table G.13. Training Relevancy of Cyber Test (CT) Content Areas by Skill Type for Courses without CT in Composite (Training Focus Area = Intelligence)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Cyber Test: | | | | | | | | | | | | | | | |
| Networking and Communications | 0.0 | 20.0 | 20.0 | 20.0 | 40.0 | 0.0 | 20.0 | 20.0 | 20.0 | 40.0 | 0.0 | 20.0 | 20.0 | 20.0 | 40.0 |
| Computer Operations | 0.0 | 20.0 | 0.0 | 40.0 | 40.0 | 0.0 | 20.0 | 0.0 | 40.0 | 40.0 | 0.0 | 20.0 | 20.0 | 20.0 | 40.0 |
| Security and Compliance | 0.0 | 0.0 | 20.0 | 40.0 | 40.0 | 0.0 | 0.0 | 20.0 | 40.0 | 40.0 | 0.0 | 40.0 | 0.0 | 20.0 | 40.0 |
| Software Programming and Web Design | 0.0 | 20.0 | 40.0 | 0.0 | 40.0 | 0.0 | 40.0 | 20.0 | 20.0 | 20.0 | 0.0 | 40.0 | 20.0 | 20.0 | 20.0 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level; ('.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB) for each content area. Results based on ratings for Intelligence courses that do not use Cyber Information in selection composite. Number of courses = 5.

# Appendix F:
# Computational Thinking (CT) Summary

# Computational Thinking Results – All Courses

***Table K.1. Training Relevancy of Computational Thinking Construct Content Areas by Skill Type (Across Services and Training Focus Areas)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Computational Thinking: | | | | | | | | | | | | | | | |
| Problem Decomposition | 0.7 | 11.8 | 17.8 | 39.5 | 30.3 | 0.7 | 12.5 | 16.4 | 40.1 | 30.3 | 3.3 | 15.8 | 15.8 | 39.5 | 25.7 |
| Pattern Recognition | 1.3 | 15.8 | 26.3 | 38.2 | 18.4 | 2.0 | 18.4 | 21.7 | 38.2 | 19.7 | 2.6 | 21.1 | 23.0 | 33.6 | 19.7 |
| Abstraction | 0.7 | 14.5 | 30.3 | 31.6 | 23.0 | 1.3 | 16.4 | 27.6 | 32.9 | 21.7 | 1.3 | 19.1 | 28.3 | 29.6 | 21.7 |
| Data Representation | 0.7 | 37.5 | 30.3 | 18.4 | 13.2 | 0.7 | 38.8 | 28.3 | 20.4 | 11.8 | 2.0 | 38.8 | 29.6 | 17.8 | 11.8 |
| Data Analysis and Visualization | 0.7 | 28.3 | 32.2 | 24.3 | 14.5 | 2.0 | 28.3 | 29.6 | 25.0 | 15.1 | 2.0 | 28.9 | 29.6 | 26.3 | 13.2 |
| Algorithms | 0.7 | 38.8 | 28.9 | 19.7 | 11.8 | 1.3 | 36.8 | 32.2 | 18.4 | 11.2 | 2.0 | 38.2 | 32.2 | 17.1 | 10.5 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level. '.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB for each content area. Results based on ratings for all courses. Number of courses = 152.

# Computational Thinking Results by Training Focus Area – Information Technology Courses

***Table K.8. Training Relevancy of Computational Thinking Construct Content Areas by Skill Type (Training Focus Area = Information Technology)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Computational Thinking: | | | | | | | | | | | | | | | |
| Problem Decomposition | 0.0 | 15.4 | 7.7 | 38.5 | 38.5 | 0.0 | 15.4 | 23.1 | 30.8 | 30.8 | 7.7 | 15.4 | 15.4 | 30.8 | 30.8 |
| Pattern Recognition | 0.0 | 7.7 | 15.4 | 46.2 | 30.8 | 0.0 | 15.4 | 15.4 | 46.2 | 23.1 | 0.0 | 15.4 | 7.7 | 53.8 | 23.1 |
| Abstraction | 0.0 | 15.4 | 30.8 | 30.8 | 23.1 | 0.0 | 15.4 | 30.8 | 30.8 | 23.1 | 0.0 | 23.1 | 30.8 | 23.1 | 23.1 |
| Data Representation | 0.0 | 30.8 | 15.4 | 23.1 | 30.8 | 0.0 | 30.8 | 15.4 | 23.1 | 30.8 | 0.0 | 30.8 | 15.4 | 23.1 | 30.8 |
| Data Analysis and Visualization | 0.0 | 30.8 | 15.4 | 30.8 | 23.1 | 7.7 | 30.8 | 7.7 | 30.8 | 23.1 | 7.7 | 23.1 | 15.4 | 30.8 | 23.1 |
| Algorithms | 0.0 | 38.5 | 15.4 | 23.1 | 23.1 | 7.7 | 30.8 | 30.8 | 7.7 | 23.1 | 7.7 | 30.8 | 30.8 | 7.7 | 23.1 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level; ('.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB) for each content area. Results based on ratings for Information Technology courses using Computational Thinking in selection composite. Number of courses = 13.

# Computational Thinking Results by Training Focus Area – Intelligence Courses

***Table K.9. Training Relevancy of Computational Thinking Construct Content Areas by Skill Type (Training Focus Area = Intelligence)***

| Content Area | Skill Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basic Knowledge | | | | | Application | | | | | Analysis | | | | |
| | '.' | NR | NB | SB | MB | ',' | NR | NB | SB | MB | '.' | NR | NB | SB | MB |
| Computational Thinking: | | | | | | | | | | | | | | | |
| Problem Decomposition | 9.1 | 9.1 | 9.1 | 18.2 | 54.5 | 0.0 | 9.1 | 9.1 | 27.3 | 54.5 | 9.1 | 9.1 | 9.1 | 18.2 | 54.5 |
| Pattern Recognition | 9.1 | 9.1 | 0.0 | 18.2 | 63.6 | 0.0 | 9.1 | 0.0 | 27.3 | 63.6 | 9.1 | 9.1 | 9.1 | 9.1 | 63.6 |
| Abstraction | 9.1 | 9.1 | 9.1 | 18.2 | 54.5 | 0.0 | 9.1 | 9.1 | 36.4 | 45.5 | 9.1 | 9.1 | 9.1 | 27.3 | 45.5 |
| Data Representation | 9.1 | 9.1 | 18.2 | 27.3 | 36.4 | 0.0 | 9.1 | 9.1 | 45.5 | 36.4 | 9.1 | 9.1 | 9.1 | 36.4 | 36.4 |
| Data Analysis and Visualization | 9.1 | 9.1 | 9.1 | 18.2 | 54.5 | 0.0 | 9.1 | 0.0 | 27.3 | 63.6 | 9.1 | 9.1 | 9.1 | 18.2 | 54.5 |
| Algorithms | 9.1 | 9.1 | 18.2 | 18.2 | 45.5 | 0.0 | 9.1 | 36.4 | 9.1 | 45.5 | 9.1 | 9.1 | 27.3 | 9.1 | 45.5 |

*Note.* Ratings represent the average percentage (rounded to the nearest integer) of raters (course instructors and developers) selecting that relevancy level; ('.' = missing; 1 = NR; 2 = NB; 3 = SB; 4 = MB) for each content area. Results based on ratings for Intelligence courses using Computational Thinking in selection composite. Number of courses = 11.