

Mason Core Assessment: Information Technology and Computing Spring 2025

Information Technology and Computing (ITC) courses develop students' ability to produce, consume, process, and communicate information using technology, while addressing challenges like security, source reliability, automation, and ethical considerations to prepare them for an evolving digital world.

Student Learning Outcomes (SLOs)

1. *Digital Information and Storage Exchange*: Students will be able to understand the principles of information storage, exchange, security, and privacy and be aware of related ethical issues.
2. *Critical Consumers of Digital Information*: Students will be able to consume digital information critically, capable of selecting and evaluating appropriate, relevant, and trustworthy sources of information.
3. *Employ Computing Technologies*: Students will be able to use appropriate information and computing technologies to organize and analyze information and use it to guide decision-making.
4. *Apply Algorithmic Methods*: Students will be able to choose and apply appropriate algorithmic methods to solve a problem.

Assessment Method

Population

- Undergraduate degree-seeking students enrolled in ITC courses during the 2022-2024 assessment period. 628 sections across 19 ITC courses served 22,286 students (see Appendix A, Table 1 for the number of sections offered and students enrolled).
- Instructors teaching courses in this category were asked to submit 3 to 15 randomly selected student artifacts and indicate the relevant SLO(s) aligned with the assignment. In total, 151 course sections (24%) submitted 1,083 artifacts for assessment (see Appendix A, Table 2 for the number of artifacts submitted and assessed by SLOs).

Sample

- Student artifacts from the 2022-2024 assessment period were randomly selected using a process designed to ensure all learning outcomes and sections were represented.
- The final representative sample included 176 student artifacts across four ITC SLOs (see Appendix A, Table 3 for the representativeness of the assessed sample).

Ratings

- Selected artifacts were evaluated by faculty raters using a standardized rubric (see Appendix A, Table 4 for the rubric).
- Each rater assessed about 40 artifacts, and final scores were determined through consensus among two or more raters (see Appendix A, Table 5 for the results).
- Descriptive analyses were conducted on the finalized scores to examine frequencies and determine the extent to which students demonstrated achievement of the learning outcomes.

Are students demonstrating achievement of the defined learning outcomes?

- Artifacts were rated as Capstone, Milestone, Benchmark, or No Evidence.
- Artifacts rated as Capstone, Milestone, or Benchmark were considered as meeting the learning outcomes.
- Artifacts rated as No Evidence were either:
 - No Evidence-Not Mapped: Artifacts not mapped to learning outcomes do not suggest students did not learn. However, the lack of mapping highlights the need for targeted faculty support to improve assignment alignment with learning outcomes.
 - No Evidence-Mapped: This finding suggests students did not meet the expectations of learning.
 - These findings suggest different approaches to improving both student learning and assessment processes.
- A baseline target of 70% was established in this round of assessment. Targets can and will be modified as both assessment processes and continuous improvement efforts are implemented.
- Figure 1 and Table 1 illustrate findings from the assessment of student artifacts for the four ITC SLOs. The target of 70% was met for SLOs 3 and 4, but not for SLOs 1 and 2.

Figure 1. Student Artifact Ratings – Visual Summary (ITC)

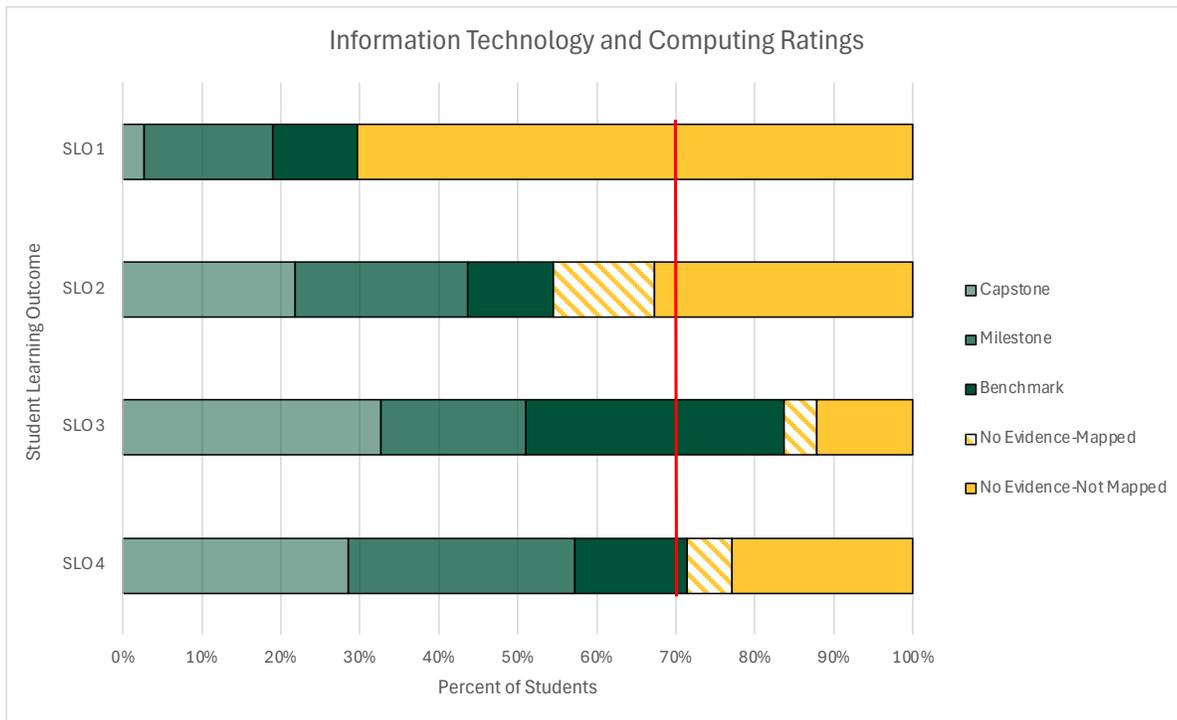


Table 1. Assessment Findings (ITC)

Student Learning Outcome	Assessment Findings	Score
SLO 1: Digital Information and Storage Exchange	<ul style="list-style-type: none"> 70% of student artifacts showed no evidence of learning due to the assignments being not mapped to the learning outcome. Multiple concepts in one statement made it difficult to measure learning in one artifact. 	30%
SLO 2: Critical Consumers of Digital Information	<ul style="list-style-type: none"> 33% of student artifacts showed no evidence of learning due to the assignments being not mapped to the learning outcome. An additional 12% showed no evidence of learning. 	55%
SLO 3: Employ Computing Technologies	<ul style="list-style-type: none"> 12% of student artifacts showed no evidence of learning due to the assignments being not mapped to the learning outcome. An additional 4% showed no evidence of learning. 	84%
SLO 4: Apply Algorithmic Methods	<ul style="list-style-type: none"> 23% of student artifacts showed no evidence of learning due to the assignments being not mapped to the learning outcome. An additional 5% showed no evidence of learning. 	72%

How has student learning changed since the previous assessment cycle?

The comparison of findings across the two assessment periods can be challenging given the modifications made from one cycle to another. Table 2 illustrates the revisions to the learning outcome statements and highlights the percentage of students meeting Benchmark or higher across both assessment periods.

Table 2. SLO Scores by Assessment Cycle

2022-2024 (n=176)	Score	2017-2020 (n=321)	Score
SLO 1: Digital Information and Storage Exchange	30%	SLO 1: Principles	52%
		SLO 1: Ethics	28%
Students will be able to understand the principles of information storage, exchange, security, and privacy and be aware of related ethical issues.		Students will understand the principles of information storage, exchange, security, and privacy and be aware of related ethical issues.	
SLO 2: Critical Consumers of Digital Information	55%	SLO 2: Information Literacy	47%
Students will be able to consume digital critically information; capable of selecting and evaluating appropriate, relevant, and trustworthy sources of information.		Students will become critical consumers of digital information; they will be capable of selecting and evaluating appropriate, relevant, and trustworthy sources of information.	
SLO 3: Employ Computing Technologies	84%	SLO 3: Decision Making	80%
Students will be able to use appropriate information and computing technologies to organize and analyze information and use it to guide decision-making.		Students can use appropriate information and computing technologies to organize and analyze information and use it to guide decision-making.	
SLO 4: Apply Algorithmic Methods	72%	SLO 4: Algorithmic Methods	74%
Students will be able to choose and apply appropriate algorithmic methods to solve a problem.		Students will be able to choose and apply appropriate algorithmic methods to solve a problem.	
N/A	N/A	SLO 5: Disciplinary Uses	77%
		Students will be able to use digital resources, methods and software, or forms of communication relevant to the scholarly or creative work of their discipline.	

What changes do the findings suggest for continuous improvement?

- **SLO 1**
 - The learning outcome includes five key areas where students must demonstrate understanding, which may need to be redefined to ensure raters can identify clear evidence of learning.
 - **Recommendation:** Revise the learning outcome to capture student learning more effectively at both the course and category levels to ensure that the full scope of the learning is assessed.
- **SLO 2**
 - The learning outcome includes multiple components related to evaluating digital information, which may need to be clarified to ensure raters can identify clear evidence of learning.
 - **Recommendation:** Revise the learning outcome to capture student learning more effectively at both the course and category levels to ensure that the full scope of the learning is assessed.
- **SLO 3**
 - **Recommendation:** Continued focus on increasing student proficiency.
- **SLO 4**
 - **Recommendation:** Continued focus on increasing student proficiency.

Mason Core Action Plan: 2025-2027	
Information Technology and Computing	
Rubric	By May 2025, revise the ITC Mason Core Assessment rubric to improve clarity and usability by simplifying the proficiency level descriptions and eliminating redundant language, resulting in a version that is more accessible and user-friendly for both instructors and raters.
Learning Outcomes	By December 2026, revise the two learning outcomes (SLO 1 and SLO 2) where fewer than 70% of students meet the benchmark by revising multi-barreled language and ensuring the revised outcomes are clear, assessable, and achievable for a wide range of instructors and students.
Assignment Alignment	By May 2027, provide targeted support, including workshops and resource guides, to faculty teaching ITC courses to improve assignment alignment with learning outcomes for the upcoming assessment cycle.

Appendix A. Information Technology and Computing

Table 1. Course Sections and Student Enrollment (ITC Fall 2022-Spring 2024)

	Course Name	Sections Offered	Students Enrolled
<i>ANTH 395</i>	Work, Technology, and Society: An IT Perspective	1	18
<i>AVT 110</i>	Digital Design Student	57	1107
<i>AVT 180</i>	New Media in the Creative Arts	36	694
<i>CDS 130</i>	Computing for Scientists	63	1,590
<i>CS 100</i>	Principles of Computing	8	389
<i>CS 108</i>	Intro to Computer Programming, Part A	8	443
<i>CS 112</i>	Introduction to Computer Programming	87	5,121
<i>CYSE 130</i>	Introduction to Computing for Digital Systems Engineering	13	728
<i>ELED 257</i>	Integrating Technology in PreK-6	10	224
<i>GOVT 300</i>	Research Methods and Analysis	35	1,016
<i>HIST 390</i>	The Digital Past	18	720
<i>INTS 203</i>	Inquiry for Action: Facilitating Change	2	29
<i>INTS 249</i>	Digital Literacy	8	221
<i>IT 104</i>	Introduction to Computing	128	4,775
<i>MIS 303</i>	Introduction to Business Information Systems	53	3,221
<i>MUSI 259</i>	Music in Computer Technology	16	368
<i>PHYS 251</i>	Introduction to Computer Methods in Physics	4	70
<i>SOCI 410</i>	Social Surveys and Attitude and Opinion Measurements	1	10
<i>SYST 130</i>	Introduction to Computing for Digital Systems Engineering	11	66
<i>PSYC 301</i>	Research Methods in Psychology	69	1,476
	TOTAL	628	22,286

Table 2. Artifacts Submitted and Assessed by SLO (ITC)

	Submitted	Assessed
SLO 1	248	37
SLO 2	295	55
SLO 3	321	49
SLO 4	219	35
Total	1,083	176

Table 3. Student Demographics (ITC)

Information Technology and Computing: Demographics					
		Sample (n=176)		Population (N=22286)	
		n	%	N	%
Gender					
	Female	95	54%	9576	43%
	Male	81	46%	12694	57%
	Unknown	0	0%	16	0%
Race/Ethnicity					
	American Indian	1	1%	27	0%
	Asian American	46	26%	5817	26%
	Black	15	9%	2759	12%
	Hispanic American	20	11%	3507	16%
	White	56	32%	6595	30%
	Two or More Races	12	7%	1204	5%
	Non Resident Alien	18	10%	1673	8%
	Native Hawaiian/Pacific Islander	0	0%	13	0%
	Unknown	8	5%	691	3%
Domicile					
	In State	142	81%	18768	84%
	Out of State	34	19%	3518	16%
Level					
	First Time Freshmen	21	12%	4863	22%
	Other Freshmen	43	24%	4640	21%
	Sophomore	53	30%	5306	24%
	Junior	42	24%	5304	24%
	Senior	16	9%	2083	9%
	UG Extended Studies	1	1%	82	0%
	UG Certificate	0	0%	8	0%
College					
	Carter School for Peace and Conflict Resolution	1	1%	114	1%
	College of Visual and Performing Arts	25	14%	920	4%
	College of Public Health	0	0%	695	3%
	College of Science	38	22%	1867	8%
	Costello College of Business	22	13%	3271	15%
	College of Education and Human Development	10	6%	512	2%
	College of Engineering and Computing	46	26%	9452	42%
	College of Humanities and Social Sciences	25	14%	3833	17%
	Schar School of Policy and Government	5	3%	959	4%
	University (Provost)	4	2%	663	3%
Campus					
	Fairfax Campus	100	57%	15199	68%
	Mason Square	0	0%	0	0%
	Mason Korea	7	4%	543	2%
	Loudon Campus	0	0%	24	0%
	Online	69	39%	6508	29%
	Prince William Campus	0	0%	11	0%
	Science and Technology Campus	0	0%	1	0%
First Generation					
	Yes	31	18%	4955	22%
	No	133	76%	15487	69%
	Unknown	12	7%	1844	8%
Housing					
	On Campus	52	30%	6227	28%
	Off Campus	124	70%	16059	72%
Load					
	Full Time	163	93%	19691	88%
	Part Time	13	7%	2595	12%
Pell					
	Yes	41	23%	6650	30%
	No	135	77%	15636	70%

Table 4. Rubric (ITC)

Information Technology and Computing	Capstone	Milestone	Benchmark	No Evidence
	3	2	1	0
SLO 1 Digital Information and Storage Exchange	Student evaluates terms and concepts related to digital information and storage exchange (e.g., information retrieval using a cloud-based platform) and solves problems or completes tasks that demonstrate a sophisticated understanding of computer security and ethical use of information technology.	Student differentiates terms and concepts related to digital information and storage exchange (e.g., data in digital format, retrieval) and discusses the application of strategies that demonstrate ethical use of information technology.	Student identifies terms and concepts related to digital information and storage exchange (e.g., number systems, image encoding) and explains examples of ethical and unethical behaviors.	There is no evidence that the student has knowledge of principles of storage or has considered ethical and unethical behaviors.
SLO 2 Critical Consumers of Digital Information	Student evaluates multiple sources of information to determine whether a source is appropriate, relevant, or trustworthy and builds contextual justification for the use of information as a critical consumer of digital information.	Student analyzes a source of information to determine whether the source is appropriate, relevant, or trustworthy and is able to mostly evaluate the information as a critical consumer of digital information.	Student describes criteria necessary for determining whether a source is appropriate, relevant, or trustworthy but only sometimes is able to evaluate the information as a critical consumer of digital information.	There is no evidence that the student can select and evaluate the quality of sources of information.
SLO 3 Employ Computing Technologies	Student uses information and computing technologies appropriate to a project, and accurately conducts advanced analysis of the information to guide decision-making for its use.	Student uses information and computing technologies appropriate to a project, and analyzes the information to make recommendations for its use.	Student uses information and computing technologies to organize information so that it is defined, consistent, and complete.	There is no evidence that the student can organize and analyze information in a way that could guide decision-making.
SLO 4 Apply Algorithmic Methods	Student selects an algorithmic method to create a logical sequence of steps and solves a problem accurately all of the time.	Student selects an algorithmic method to solve a problem accurately most of the time.	Student recalls and uses a preselected sequence of steps (algorithm) to solve a problem accurately some of the time.	There is no evidence that the student can use an algorithmic method to solve a problem accurately.

Table 5. Student Artifact Ratings – Counts and Percentages (ITC)

Information Technology and Computing	Capstone		Milestone		Benchmark		No Evidence: Mapped		No Evidence: Not Mapped		Total
	n	%	n	%	n	%	n	%	n	%	n
SLO 1 Digital Information and Storage Exchange	1	3%	6	16%	4	11%	0	0%	26	70%	37
SLO 2 Critical Consumers of Digital Information	12	22%	12	22%	6	11%	7	12%	18	33%	55
SLO 3 Employ Computing Technologies	16	33%	9	18%	16	33%	2	4%	6	12%	49
SLO 4 Apply Algorithmic Methods	10	29%	10	29%	5	14%	2	5%	8	23%	35