



Lumpkin College of Business and Technology
Office of the Dean

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April 26, 2021

Dr. Toqeer Israr
Program Coordinator, Computer and Information Technology
RE: Year 2 Program Assessment Review

Documents submitted and reviewed:

- 1) Progress Report (word doc) dated 10/23/2020
- 2) Program Objectives, Student Outcomes, Performance Indicators (word doc)
- 3) Curriculum Map (xls file) dated 10/23/2020
- 4) Rubrics (xls in separate files): SO1, SO2, SO4, SO5, SO6
- 5) Writing & Critical Reading Rubric for SO3 (word doc)
- 6) Speaking Rubric for SO3 (pdf)

Evaluated Aspects of Program Assessment	Stage of Maturity (Beginning, Developing, Acceptable, Exemplary)
A. Student Learning Outcomes	Acceptable
B. Measurement Tools and Assignments	Beginning
C. Data Collection and Integrity	Developing
D. Expectations and Results	Beginning
E. Discussion and Analysis	Beginning
F. Use of Assessment Results for Program Improvement	Beginning
G. Faculty Engagement in Assessment	Beginning

Summary of Assessment Evaluation:

The CIT program faculty have begun to develop an assessment plan. The SLOs appear sound and the initial work on rubrics has been completed and is on the right track to meet the objectives of assessment for program development. It is understood that at this early phase of assessment development that you have many working pieces of assessment in separate files. Please be alert to the EIU intended documentation to be submitted for Year 4 and provide it aligned to the expectations. This will be easier once you have data and need the cumulative reporting structure for your analysis. However, as assessment is in a four-year cycle, and Spring 2021 is the end of Year 3, you will need to review your processes and retroactively document what has been done, and be more complete in using the required tables and questions that are to be included in the Year 4 report.

Melody L Wollan, PhD, SHRM-SCP
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Academic Program	Computer and Information Technology
Evaluation Point	Year 2 (AY 2020) of 4
Program-level Accreditation	None
Academic Years in Reporting Cycle	AY19 - AY23
Reviewer Name, Title	Melody Wollan, LCBT Associate Dean

A. Student Learning Outcomes (SLO)

Specific statements that articulate the discipline-specific content, skills, and/or dispositions students should gain or improve through engagement in the program

<ul style="list-style-type: none"> • SLO does not specify what group of students will achieve mastery of it, and/or at what point(s) in their progression through the program they will do so. • SLO contains only imprecise verbs (e.g., “know,” “understand”), and thus is difficult to measure. • SLO is too broad or vague to guide the assessment process. 	<ul style="list-style-type: none"> • SLO is clear about what group of students will achieve mastery of it (e.g., majors, students in the program), but not at what point in their progression through the program they will do so. • SLO contains action verbs that reflect an inadequate depth of knowledge for the program. • SLO contains a general description of the content knowledge, skills, and/or dispositions to be measured, but the description is not discipline-specific. 	<ul style="list-style-type: none"> • SLO is clear about what group of students will achieve mastery of it, and at what point in their progression through the program they will do so (e.g., “seniors,” “graduates”). • SLO contains precise, measurable, and observable verbs that reflect an appropriate depth of knowledge for the program. • SLO contains a discipline-specific description of the content knowledge, skills, and/or dispositions that students will demonstrate. 	<ul style="list-style-type: none"> • A reasonable number of SLOs are identified — enough to adequately accomplish the mission of the program while still being manageable to assess on an annual basis. • Overall SLOs reflect appropriate level of expectation for the program type/level. • Overall SLOs stated in student-centered terms, reflecting what students should know, do, and/or think as they engage in the program of study.
BEGINNING <input type="checkbox"/>	DEVELOPING <input type="checkbox"/>	ACCEPTABLE <input checked="" type="checkbox"/>	EXEMPLARY <input type="checkbox"/>
Comments:	<p>This is a relatively new program (< 4 years) and the faculty’s first efforts at assessment in this major. The program intends to apply for ABET accreditation, and is using the guidelines and requirements for ABET in designing their assessment program. The faculty identify 6 Student Learning Outcomes that are required by ABET. Although the SLO does not indicate progression points, other elements of the plan indicate both formative and summative efforts to assess the SLO.</p>		

B. Measurement Tools and Assignments

Description of the measurement tool and the associated assignment, how they align with the SLO, and their validity

<ul style="list-style-type: none"> SLO is assessed with only indirect measure(s) (i.e., surveys). No information is provided about how the measurement tool(s) and assignment(s) relate to the SLO. 	<ul style="list-style-type: none"> SLO is assessed with direct measure(s) (i.e., objective tests, rubrics). General description is provided of the measurement tool(s) and assignment(s). General information is provided about how the measurement tool(s) and assignment(s) relate to the SLO. 	<ul style="list-style-type: none"> Detailed description of measurement tool(s) and its alignment with the SLO is provided. This includes: <ul style="list-style-type: none"> for an objective test measurement tool, individual questions are identified and valid to the SLO (or element of the SLO), and expected levels of mastery are indicated; for an analytic rubric measurement tool, each trait is mapped to the SLO (or element of the SLO) and each level details expectations. Detailed description of the assignment(s) and alignment with the SLO is provided. This includes: <ul style="list-style-type: none"> for an objective test assignment, representative test items are described to indicate relevance to the SLO and the expected level of mastery; for a performance-based assignment evaluated with an analytic rubric, the assignment prompt is described to indicate relevance to the SLO and the expected level of mastery. Measurement tool(s) will provide a direct/observable result and are appropriate to the SLO and the level of mastery expected. Assignment(s) are appropriate to the SLO and the level of mastery expected. 	<ul style="list-style-type: none"> Direct measures may be supplemented with indirect measures. Includes both formative and summative measures. A description of the development process for the measurement tool(s) and assignment(s) is included to illustrate their appropriateness to the SLO.
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BEGINNING <input checked="" type="checkbox"/>	DEVELOPING <input type="checkbox"/>	ACCEPTABLE <input type="checkbox"/>	EXEMPLARY <input type="checkbox"/>
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Assessment Methods: What type of assessment methods does the program use?	<input checked="" type="checkbox"/> Direct Measures Measures that require students to demonstrate knowledge and skills. Provide tangible, visible, and self-explanatory evidence of what students have and have not learned. Actual student behavior or work is measured or assessed	<input type="checkbox"/> Indirect Measures Assessments that measure opinions or thoughts about student's knowledge, skills, attitudes, learning experiences, perceptions of services received or employers' opinions. Do not measure students' performance directly
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Measurement Tools: What type of measurement tools does the program use?	<input type="checkbox"/> Objective Test Measure that has right or wrong answers and can be quickly and unambiguously scored by anyone with an answer key.	<input checked="" type="checkbox"/> Analytic Rubrics Measures that are subjective for performance-based assignments. Resembles a grid with criteria for student project listed in the leftmost column and with all levels of performance listed across the top row. The cells within the center contain descriptions of what specified criteria look like for each level of performance. Each of the criteria is scored individually	<input type="checkbox"/> Surveys Measures for collecting data from a pre-defined group of respondents to gain information and insights on a topic of interest	<input type="checkbox"/> Other Could include a holistic rubric (single scale with all criteria being considered together), or a checklist (only two performance levels possible and no descriptions included).
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Comments: Critically, non-accredited programs are "required to submit the Year 2 Assessment Template" as per the Provost's memo on assessment from December 2019 that includes (at a minimum) a column for SLO, ULG, Measures/Instruments, and How is the Information Used? I'd also encourage a Formative/Summative column. This document was not submitted, and does not appear to be prepared but will be required for Year 4 and should be accumulated for Years 2, 3, and 4 in this cycle.

It appears that all assessment is being collected from rubrics, and indirect measures may be valid – especially as your program matures to having graduates for which exit interviews or surveys could be insightful. Also consider internship employers as a source of indirect measures and feedback on these objectives for your program.

In terms of the individual rubrics, SO1 (analyze a complex computing problem) and So2 (design, implement, and evaluate a computing-based solution) are listed with 3 levels of performance and 4 factors. Descriptions are concise but clear; may need to be evaluated and refined as they are used. A comment that appears relevant to all of the rubrics: I'd suggest that a numerical system be included in your rubric as a means of quantifying and allowing for more variance in your evaluations (i.e., instead of discrete levels as 4, 3, 2, or 1, you might make them on a scale and use to the ¼ or ½ or 1/10 point system).

The writing and critical reading rubric (what appears to be the measurement for SO3) has been modified from the university's writing rubric and has 7 component factors that will be helpful individually in determining where intervention(s) are necessary to achieve desired results. The factors are sound; the descriptions of each level of each factor are excellent. Similarly, the speaking rubric appears to be the equivalent of the EIU rubric and has been thoroughly vetted and used for many years effectively for assessment and for grading purposes alike.

SO4 (ethics) appears to be in a draft form with proofreading needed. I'd also recommend requesting ethics rubrics from at least two other sources – university and School of Business, for example, so that you can provide more detailed descriptors of factors. The submitted rubric is a 3 x 3, and does not fully capture the nuances from your SLO in my opinion.

SO5 (teams) is a 4 x 4; while sufficient, you may benefit from communicating with other program coordinators to see what they are utilizing and refine your descriptions accordingly.

SO6 (...secure computing technologies...) is a 3-level, 5-factor rubric; A numeric equivalent is not present on this rubric though it may be assumed. I'm a little concerned that some factors do not seem progressive going from summarize (low end) to apply to examine/evaluate (high-end) as typically we would see each of those actions being their own factors and students would be rated on each given that all of these actions are part of an evaluation sequence. I would encourage the faculty review this metric and consider whether those are the accurate descriptors as compared to other rubrics being used.

C. Data Collection and Integrity

When measurement tools are applied, to whom, at what point in the program, and how the program ensures consistency across multiple administrations of the tools and assignments (reliability)

<ul style="list-style-type: none"> • It is unclear how the information provided relates to this assessment cycle. 	<ul style="list-style-type: none"> • Information is provided about the data collection process in this cycle, but not enough to generate confidence in the findings (e.g., sample size is too small, student motivation conditions are inconsistent, rubric is not normed with raters, etc.) • Process will provide limited information for guiding instruction and curriculum. 	<ul style="list-style-type: none"> • Enough information is provided about administration of the measurement tool and data collection process to generate confidence in the findings. This includes: <ul style="list-style-type: none"> ○ adequate student population targeted with an assignment and measurement tool; ○ sufficient sample size for statistically significant results (especially if different than the student population), with a rationale for representative sampling (if appropriate); ○ consistent student motivation conditions across multiple administrations of the assignment and measurement tool; • Process will provide useful information for guiding instruction and curriculum. 	<ul style="list-style-type: none"> • Information provided demonstrates that data collection occurs throughout the curriculum and involves multiple faculty members. • Information is included about how data are collected and responsibility is shared among faculty members. • An ongoing, inclusive, systematic process is in place for collecting data to make decisions and improve learning within the program, appropriate to the program’s internal and external constituencies.
<p>BEGINNING <input type="checkbox"/></p>	<p>DEVELOPING <input checked="" type="checkbox"/></p>	<p>ACCEPTABLE <input type="checkbox"/></p>	<p>EXEMPLARY <input type="checkbox"/></p>

<p>Comments:</p>	<p>At this stage (Year 2) the focus has been on establishing the SLOs and measurement devices. The submitted curriculum map of a plan where assessment data will be collected is helpful – at this time 11 courses are involved in data collection across the program (of 22 self-identified courses). 7 of these take place in freshman/sophomore level courses, with the remaining four coming from more summative experiences in upper division classes.</p>
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D. Expectations and Results

SLO have clearly identified expectations that reflect size and maturity of the program. Clear and concise illustration/presentation of data collected. Includes narrative or table/figure with sample size, count, averages, percentages, and ranges as appropriate to the assessment tool

<ul style="list-style-type: none"> No expectations are presented, or it is unclear how the expected results relate to the SLO. No results are presented, or it is unclear how the results relate to the SLO. 	<ul style="list-style-type: none"> Expectations and results are presented and relate to the SLO, but a lack of specificity does not allow useful conclusions to be drawn. Presentation is insufficiently detailed; only overall student scores or averages are presented. 	<ul style="list-style-type: none"> Expectations and results are presented by SLO. Tables and graphs effectively communicate results, including sample size, count, averages, percentages, and ranges, as appropriate to the measurement tool. For objective tests, results are presented according to items or groups of items connected to a SLO. For rubrics, results are presented according to rubric trait and level, including counts and percentages. Results include all applicable locations and/or delivery modes. 	<ul style="list-style-type: none"> Expectations and results are easily understood, as well as their implications. Results are presented for all locations and/or delivery modes showing an equivalent level of rigor and detail.
<p>BEGINNING <input checked="" type="checkbox"/></p>	<p>DEVELOPING <input type="checkbox"/></p>	<p>ACCEPTABLE <input type="checkbox"/></p>	<p>EXEMPLARY <input type="checkbox"/></p>

Comments:

No results have been generated at this time; data collection appears to be taking place initially in Spring 2021 (end of year 3). No expectations have yet been identified and should be determined by evaluating the rubrics that you have defined and determining what you think program level of acceptability is sufficient. I note that in your progress report you've stated "As per ABET recommendation, we do not wish to set the thresholds until after the first cycle of data collection".

In your results, remember that the expectations should reflect a count or % of students that achieve the desired results. You may want to have formative expectations (baseline) and summative expectations (upon graduation or those capstone experiences). You may also want to develop expectations based on "average", or reflecting your exceptional level of students (i.e., 10% of students taking the assessment will achieve cumulative scores of 4 out of 4 on the xyz rubric), or some combination of aspirational and average, depending on the SLO and your program.

E. Discussion and Analysis

Explains the meaningfulness of the data presented (interpretation of results) with a clear, complete, and succinct analysis focusing on the interpretation of and reflection on the assessment data

<ul style="list-style-type: none"> • No interpretation is attempted, or the interpretation does not relate to the SLO and/or the results. 	<ul style="list-style-type: none"> • Interpretation is attempted, relates to the SLO and/or results, but the interpretation is either: <ul style="list-style-type: none"> ○ insufficient to support programmatic decisions, ○ not aligned with the program’s previous action plans, ○ offering excuses for results rather than thoughtful interpretations leading to improvements in student learning. 	<ul style="list-style-type: none"> • Interpretation is aligned with the program’s SLOs. • Interpretation is explained in terms of the desired levels of student performance and is based on student achievement of those levels. • Interpretation is justified through current disciplinary standards, previous results and/or benchmarks. • Interpretation includes how courses, experiences, and/or the assessment process might have affected results. • Interpretation indicates the appropriate collaboration and consensus of multiple internal stakeholders (e.g., program faculty, committees, staff, and/or students). • Interpretation is detailed enough to justify programmatic decisions concerning changes in instruction and/or curriculum. 	<ul style="list-style-type: none"> • Interpretation directly addresses the program’s SLOs and action plans. • Interpretation addresses past trends in student performance, as appropriate. • Strengths and weaknesses in student learning are easily identified. • New findings are compared to past trends, as appropriate. • Interpretation identifies possible areas of improvement, thus initiating future actions.
<p>BEGINNING <input checked="" type="checkbox"/></p>	<p>DEVELOPING <input type="checkbox"/></p>	<p>ACCEPTABLE <input type="checkbox"/></p>	<p>EXEMPLARY <input type="checkbox"/></p>

Comments:

Interpretation is not applicable at this time for this review given the level of development of assessment in this program.

F. Use of Assessment Results for Program Improvement

Strategies planned and/or in progress for program improvement; actions designed to improve instruction and curriculum; rationale for action is based on data and analysis of results

<ul style="list-style-type: none"> • No actions proposed for the next cycle. • Proposed actions are not based on the data captured through the assessment process. • Proposed actions are unrelated to the improvement of the educational program, and therefore student learning. 	<ul style="list-style-type: none"> • The connection between proposed actions, results/discussion, and/or SLOs is not clear. • Proposed actions are too broad or vague to guide the improvement of the educational program and student learning. • Proposed actions do not demonstrate evidence of input from more than one person. • Proposed actions pertain only to assessment plan changes (process/measure only). 	<ul style="list-style-type: none"> • Proposed actions are directly connected to the SLOs. • Proposed actions are data-driven, directly related to the results/discussion. • Proposed actions focus on the improvement of the educational program and student learning. If modifications are made to the assessment process, they are data-driven. • Proposed actions contain a process for evaluating their effectiveness. • Proposed actions demonstrate evidence of input from multiple internal stakeholders. • Carryover actions from the previous cycle are noted. • If a SLO is not addressed by any proposed actions, justification is given for maintenance of ongoing curriculum and instruction. 	<ul style="list-style-type: none"> • Proposed actions are specifically detailed, including who will be responsible for implementation, approximate dates of implementation, and notes about where in the curriculum and in what specific classes they will occur.
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BEGINNING DEVELOPING ACCEPTABLE EXEMPLARY

Comments:

The program coordinator and faculty are being thoughtful and deliberate in each step of assessment as demonstrated by the materials supplied for this year’s review. There is also evidence of multiple individuals being involved in development of rubrics. I’m impressed that the program is focused on ABET standards with a view towards eventual accreditation as that provides a standard from which to build an assessment program. I do not see that any strategy has been developed for analysis. Please note that with the Year 2 report, the Improvements and Changes Based on Assessment with 3 required elements was not included and is required for Year 2 and 4 reports, summarizing what has been done on an annual basis. Efforts should be made to retroactively document these materials so that they are included in the Year 4 report.

G. Faculty Engagement in Assessment

Faculty engagement individually and collectively in the assessment process such as review of the outcomes data, revisions and updates to assessment plan, and reaffirmation of SLOs.

<ul style="list-style-type: none">• Assessment is done primarily by program coordinator/assistant chair.• Data is primarily collected in capstone activities.	<ul style="list-style-type: none">• The assessment reporting and analytical processes are conducted by the program coordinator or assistant chair with data being collected by faculty.• Faculty review outcomes and resulting data at least once per year.	<ul style="list-style-type: none">• The program has an organized systematic plan in which all faculty participate in at least one stage of assessment.• Analysis of results informs faculty decision-making related to curricular and program improvements.• Faculty review outcomes and resulting data at least once per year collectively, but those discussions influence other program discussions made throughout the year.	<ul style="list-style-type: none">• Program faculty are highly engaged throughout the assessment process as demonstrated at all stages.• Faculty recommend interventions and participate in revising assessment activities for continuous program improvement.
BEGINNING <input checked="" type="checkbox"/>	DEVELOPING <input type="checkbox"/>	ACCEPTABLE <input type="checkbox"/>	EXEMPLARY <input type="checkbox"/>

Comments:

This information was required, but not included in the materials provided for a Year 2 evaluation.

CIT Assessment Plan – Progress Report as of 10/23/20

Completed Actions:

1. To spearhead the task of assessment planning, we have formed the CIT Core Committee consisting of:

Dr. Israr
Dr. Boonsuk
Mr. Bhutta

We have been holding weekly meetings with significant amount of research being done outside of the meeting to understand how assessment is performed

2. We have watched and discussed the following Webinars on the ABET website as they pertain to CIT at EIU:
 - i. Program Educational Objective
 - ii. Student Outcomes
 - iii. Curriculum Map
 - iv. Assessment Methods
 - v. Reporting Results
3. We have developed Program Educational Objectives for CIT. These are skills which the graduates are expected to attain within a few years of graduation.
4. Student outcomes of CIT are being driven by accreditation standards set by ABET's Accreditation commission "Computing Accreditation Commission" (<https://www.abet.org/wp-content/uploads/2018/02/C001-18-19-CAC-Criteria-Version-2.0-updated-02-12-18.pdf>). We have reviewed these student outcomes and feel that these are sufficient as is and need not to be modified.
5. For each of the student outcomes, we have developed Performance Indicators. Performance Indicators are concrete measurable performances students must meet as indicators of achievement of a given student outcome. Performance indicators are chosen purposefully to measure a range of learning levels (such as knowledge, comprehension, application, analysis, evaluation, and create – in other texts, it is also referred as Bloom's taxonomy).

For each performance indicator, we have developed a standard rubric which instructors can use to measure a given performance indicator. For student outcomes overlapping with University learning goals (such as communication – writing and critical reading, and speaking and listening), we are using the EIU rubrics found at <https://www.eiu.edu/assess/ewpdata.php>.

We are in the process of developing curriculum map. Our preference is that we assess performance indicators and collect data as much as we can, in the following priority:

- i. Courses with CIT Prefixes taught by SOT Instructors
- ii. Courses with non-CIT prefixes taught by SOT Instructors
- iii. Courses taught by non-SOT Instructors

Currently, we have solicited and received assessment capabilities from various instructors within SOT, and we are in the process of completing the curriculum map.

As per ABET recommendation, we do not wish to set the thresholds until after the first cycle of data collection

Things to do:

1. Finish the curriculum map – This will require collaboration with other college as some outcomes can only be assessed by courses taught by other colleges
2. Develop a plan to plan execute tasks for each outcome per year such as:
 - a. Map/Review Educational Strategies (courses) to performance indicators
 - b. Review mapping and identify where data will be collected
 - c. Develop and/or review assessment methods used to assess performance indicators
 - d. Collect Data
 - e. Evaluate assessment data and assessment processes, determine actions
 - f. Report findings
 - g. Take action where necessary

Example:

Assessment and Evaluation Activity	Cycle 1				Cycle 2				Cycle 3			
	F '17	S '18	F '18	S '19	F '19	S '20	F '20	S '21	F '21	S '22	F '22	S '23
Map/Review educational strategies (courses) to performance indicators	X				X				X			
Review mapping and identify where data will be collected	X				X				X			
Develop and/or review assessment methods used to assess performance indicators	X				X				X			
Collect data		X				X				X		
Evaluate assessment data and assessment processes, determine actions			X				X				X	
Report findings			X				X				X	
Take action where necessary				X				X				X

ABET Program Educational Objectives

Graduates are expected to attain the following within a few years of graduation:

<Specific to EIU CIT and it can be modified as per faculty's input>

1. to apply and continuously acquire knowledge, both theoretical and applied, related to core areas of computer and/or information technology,
2. to solve diverse and/or unique problems in computer and/or information technology related field
3. to work productively as computer professionals (in traditional careers, graduate school, or academia) by:
 - a. continuously exhibiting effective use of oral and written communication,
 - b. working effectively as a team leader and/or a member of a team
 - c. adhering to ethical standards in the profession.
4. to earn professional credentials and advanced degrees in computer/information technology related field throughout their careers

CIT Student Outcomes

<pretty fixed – this is driven by ABET – we need to have these outcomes>

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Use systemic approaches to select, develop, apply, integrate, and administer secure computing technologies to accomplish user goals.

Performance Indicators

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

PI:

- a. Identifies the problem and problem-solving strategy [remember]
- b. Applies appropriate solution method using math/science/engineering principles [apply]
- c. Generates a problem solution [create]
- d. Evaluates alternate solutions [evaluate]

2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

PI:

- a. Produce a design document to implement appropriate components or techniques [create]
- b. Implement a component or technique or system or solution [apply]
- c. Evaluate a component or technique or system or solution to determine if it meets the specifications [evaluate]
- d. Revise solution based on the results of evaluation [apply][create]

3. Communicate effectively in a variety of professional contexts.

PI: Writing

- a. Creating documents appropriate for specific audiences, purposes, genres, disciplines, and professions. [create]
- b. Crafting cogent and defensible applications, analyses, evaluations, and arguments about problems, ideas, and issues. [create]
- c. Producing documents that are well-organized, focused, and cohesive. [apply][create]
- d. Using appropriate vocabulary, mechanics, grammar, diction, and sentence structure. [apply]
- e. Understanding, questioning, analyzing, and synthesizing complex textual, numeric, and graphical sources. [understand]
- f. Evaluating evidence, issues, ideas, and problems from multiple perspectives. [evaluate]
- g. Collecting and employing source materials ethically and understanding their strengths and limitations [apply] [understand]

PI: Speaking and Listening

- a. Collecting, comprehending, analyzing, synthesizing and ethically incorporating source material. [understand] [apply] [create]
- b. Adapting formal and impromptu presentations, debates, and discussions to their audience and purpose. [apply]
- c. Developing and organizing ideas and supporting them with appropriate details and evidence. [create]
- d. Using effective language skills adapted for oral delivery, including appropriate vocabulary, grammar, and sentence structure. [apply]
- e. Using effective vocal delivery skills, including volume, pitch, rate of speech, articulation, pronunciation, and fluency. [apply]

- f. Employing effective physical delivery skills, including eye contact, gestures, and movement. [apply]
- g. Using active and critical listening skills to understand and evaluate oral communication. [apply] [understand] [evaluate]

4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

PI:

- a. Identify professional competency in the discipline [remember]
- b. Understand and apply code of ethics for the discipline [understand] [apply]
- c. Evaluate the ethical dimensions of a problem in the discipline [evaluate]

5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

PI:

Option 1:

- a. Contributes to Team Meetings [create]
- b. Facilitates the Contributions of Team Members [evaluate] [analyze]
- c. Individual Contributions Outside of Team Meetings [create]
- d. Fosters Constructive Team Climate [analyze] [evaluate]

6. Use systemic approaches to select, develop, apply, integrate, and administer secure computing technologies to accomplish user goals.

PI:

- a. Investigate security vulnerabilities in a system. [analyze]
- b. Use the principles of secure design. [apply]
- c. Discuss the benefits and limitations of designing multiple layers of defenses. [understand]
- d. Analyze the tradeoffs associated with designing security into a product. [analyze]
- e. Apply security principles and practices in a system. [apply]

Bloom's taxonomy:

<https://tips.uark.edu/blooms-taxonomy-verb-chart/>

