SAINT LOUIS UNIVERSITY.

Program Assessment Plan

Program:	**Bachelor of Science in Computer Science**
Department:	**Computer Science**
College/School:	**Arts & Sciences**
Date:	**June 29, 2018**
Primary Assessment Contact:	**David Letscher (Assessment Committee Chair) and Michael Goldwasser (Department Chair)**

Note: Each cell in the table below will expand as needed to accommodate your responses.

#	**Program Learning Outcomes** What do the program faculty expect all students to know, or be able to do, as a result of completing this program? ▪ *Note: These should be measurable, and manageable in number (typically 4-6 are sufficient).*	**Assessment Mapping** From what specific courses (or other educational/professional experiences) will artifacts of student learning be analyzed to demonstrate achievement of the outcome? Include courses taught at the Madrid campus and/or online as applicable.	**Assessment Methods** What specific artifacts of student learning will be analyzed? How, and by whom, will they be analyzed? ▪ *Note: the majority should provide direct, rather than indirect, evidence of achievement.* Please note if a rubric is used and, if so, include it as an appendix to this plan.	**Use of Assessment Data** How and when will analyzed data be used by faculty to make changes in pedagogy, curriculum design, and/or assessment work? How and when will the program evaluate the impact of assessment-informed changes *made in previous years*?
1	Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.	CSCI 2100 CSCI 3100	Student artifacts will be a combination of embedded test questions and questions from homework assignments. Rubric is attached.	(explanation follows table)
2	Design, implement, evaluate and test a software system that meets a given set of computing requirements.	CSCI 2100 CSCI 2300 CSCI 3300 CSCI 4961/4962	Student artifacts will be a combination of submitted design document and analysis of code from programming projects. Rubric under development. Indirect evidence from student, alumni, and employer surveys.	(explanation follows table)
3	Apply computer science theory, knowledge of computer systems and software development fundamentals to produce computing-based solutions.	CSCI 3100, 3200, 3300, 3500 CSCI 3650, 3710, 4650, 4850 CSCI 4961/4962	Student artifacts will be a combination of embedded test questions and questions from homework assignments. Rubric under development.	(explanation follows table)

4	Communicate effectively to both professional and general audiences in both oral and written forms.	CSCI 3300 CSCI 4961/4962 PHIL 3410	Technical writing: Design documents Non-technical writing: Final papers in Computer Ethics Oral communication (both technical and non-technical): Presentations in Capstone and Computer Ethics Rubrics attached. Indirect evidence from student, alumni, and employer surveys.	(explanation follows table)
5	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.	PHIL 3410	Group projects and final papers. Rubric is attached.	(explanation follows table)
6	Function effectively as a member of a team in developing computing technology and solving technical problems.	CSCI 3300 CSCI 4961/4962 PHIL 3410	Products of group work and self-assessment forms from individual group members. Rubric is attached. Indirect evidence from student, alumni, and employer surveys.	(explanation follows table)

Assessment Processes and Use of Assessment Data

The department's standing assessment committee consists of an assessment coordinator and two other members. The committee is responsible for determining which courses and sections will be assessed during an academic year and what artifacts will be examined. Course instructors for selected sections will be responsible for collecting artifacts of student learning. The course instructor is also responsible for directly analyzing half of those artifacts, while the assessment committee will analyze the other half. The assessment committee is responsible for preparing the annual assessment report and communicating its findings and possible recommendations to the department as a whole.

The department as a whole is involved as follows. Each August the assessment committee meets with the department to identify priorities or concerns, and to discuss assignments for course-level assessments. Each January the committee meets with the department to share results from Fall courses. Each May the committee meets with the department to give a preliminary version of the annual report and identify any priorities or concerns that need to be further studied or addressed.

Additional Questions

1. On what schedule/cycle will faculty assess each of the above-noted program learning outcomes? *(It is not recommended to try to assess every outcome every year.)*

The assessment plan will operating on a six-year cycle, with direct collection and analysis of each outcome twice per cycle, as follows.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PLO 1 Problem Analysis	CSCI 2100			CSCI 3100		
PLO 2 Design/Implementation		CSCI 2100 CSCI 2300 Employer Survey			CSCI 3300 CSCI 4961/4962 Employer Survey	
PLO 3 Apply theory/knowledge			CSCI 3100 CSCI 3200 CSCI 3300			CSCI 3500, 3650, 3710, 4650, 4850 CSCI 4961/4962
PLO 4 Communication		CSCI 3300 CSCI 4961/4962 Employer Survey			PHIL 3410 Employer Survey	
PLO 5 Informed judgment			PHIL 3410			PHIL 3410
PLO 6 Teamwork	CSCI 3300 PHIL 3410	Employer Survey		CSCI 4961/4962	Employer Survey	

2. Describe how, and the extent to which, program faculty contributed to the development of this plan.

Given significant changes to our outcomes and assessment planning, a faculty member was given a course release in Spring 2018 to focus on assessment planning. Assessment plans were discussed with all department faculty at two dedicated meetings. The chairperson prepared this document.

3. On what schedule/cycle will faculty review and, if needed, modify this assessment plan?

With this being a new plan to be implemented in the coming six-year cycle, we expect that process will lead to repeated consideration of the coherency of the plan itself, with revisions as warranted.

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Department of Computer Science: Assessment Rubrics

Programs:	**BA Computer Science, BS Computer Science, MS Computer Science, MS Software Engineering**
Department:	**Computer Science**
College/School:	**Arts & Sciences**
Date:	**June 29, 2018**
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PLO: Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.

Criterion	4: Exemplary	3: Accomplished	2: Developing	1: Beginning
Data structure selection	Considers the various options for data structures, including adaptations of standard data structures, to utilize in solutions to a problem, the trade-offs and choose the most appropriate one and justify its selection.	Considers the various options among standards data structures to utilize in solutions to a problem, the trade-offs and choose the most appropriate one and justifies its selection.	Uses one of a few standard flexible data structures for all purposes.	Makes poor selections of data structures.
Algorithm identification	Considers algorithmic options, evaluates their trade-offs in effectiveness, and verifies correctness.	Selects an algorithmic solution to a problem, verify its correctness AND evaluate it effectiveness.	Selects an algorithmic solution to a problem, and verifies either its correctness OR evaluates its effectiveness.	Selects an algorithmic solution that seems to solve the problem, but cannot justify its correctness or evaluate its effectiveness.
Asymptotic analysis	Analyzes code/pseudo-code to solve complicated problems and accurately calculate the asymptotic runtime. Can use charging schemes, recursion are related techniques in the evaluation.	Anayzes code that uses recursion or loops and accurately calculate the asymptotic run-time.	Analyzes simple recursion or loops in their runtime calculations.	Can only provide unjustified runtimes for algorithms.
Code correctness	Analyzes complex algorithms and verify that they correctly solve the stated problem.	Analyzes complex algorithms and verify that they correctly solve the stated problem but miss special/boundary cases.	Analyzes straightforward algorithms and verify that they correctly solve the stated problem.	Provides some evidence that the algorithms correctly solve the stated problem.

PLO: Communicate effectively to both professional and general audiences in both oral and written forms.

Criterion	4: Exemplary	3: Accomplished	2: Developing	1: Beginning
Oral: Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Oral: Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Oral: Supporting materials	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/authority on the topic.
Oral: Central message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported).	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced, but is not explicitly stated in the presentation.
Written: Context and purpose	Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.	Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).	Demonstrates awareness of context, audience, purpose, and to the assigned tasks(s) (e.g., begins to show awareness of audience's perceptions and assumptions).	Demonstrates minimal attention to context, audience, purpose, and to the assigned tasks(s) (e.g., expectation of instructor or self as audience).
Written: Sources and evidence	Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the	Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.	Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate for the discipline and genre of the	Demonstrates an attempt to use sources to support ideas in the writing.

	writing.		writing.	
Written: Syntax and mechanics	Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.	Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors	Uses language that generally conveys meaning to readers with clarity, although writing may include some errors.	Uses language that sometimes impedes meaning because of errors in usage.
Written: Content development	Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding, and shaping the whole work.	Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.	Uses appropriate and relevant content to develop and explore ideas through most of the work.	Uses appropriate and relevant content to develop simple ideas in some parts of the work.
Written: Technical context	Conveys all of the technical knowledge necessary in the document, using appropriate technical terminology and document structure appropriate to the subject.	Effectively conveys technical knowledge in a document, with shortcomings in only one of completeness, organization, or appropriate use of technical terminology.	Effectively conveys technical knowledge in a document, with shortcomings in two or more of completeness, organization, or appropriate use of technical terminology.	Conveys technical knowledge in a document, but with significant shortcomings in each of completeness, organization, and appropriate use of technical terminology.

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

Criterion	4: Exemplary	3: Accomplished	2: Developing	1: Beginning
Issue Recognition	Student can recognize ethical issues when presented in a complex, multi-layered context AND can recognize cross-relationships among the issues.	Student can recognize ethical issues when issues are presented in a complex, multi-layered context OR can grasp cross-relationships among the issues.	Student can recognize basic and obvious ethical issues and grasp (incompletely) the complexities or interrelationships among the issues.	Student can recognize basic and obvious ethical issues but fails to grasp complexity or interrelationships.
Application of Ethics	Student can independently apply ethical perspectives/concepts to an ethical question, accurately, and is able to consider full implications of the application.	Student can independently (to a new example) apply ethical perspectives/concepts to an ethical question, accurately, but does not consider the specific implications of the application.	Student can apply ethical perspectives/concepts to an ethical question, independently (to a new example) and the application is inaccurate.	Student can apply ethical perspectives/concepts to an ethical question with support (using examples, in a class, in a group, or a fixed-choice setting) but is unable to apply ethical perspectives/concepts independently (to a new example).
Evaluation of ethical perspectives	Student states a position and can state the objections to, assumptions and implications of and can reasonably defend against the objections to, assumptions and implications of different ethical perspectives/concepts, and the student's defense is adequate and effective.	Student states a position and can state the objections to, assumptions and implications of, and respond to the objections to, assumptions and implications of different ethical perspectives/concepts, but the student's response is inadequate.	Student states a position and can state the objections to, assumptions and implications of the different perspectives/concepts, but does not respond to them (and ultimately objections, assumptions, and implications are compartmentalized by student and do not affect student's position).	Student states a position but cannot state the objections to, assumptions and implications of objections to and assumptions and limitations of the different perspectives/concepts.
Professional codes	Student can explain the ACM code and utilize it, combined with normative ethics, to make judgments of appropriate professional behavior.	Student can explain the ACM code and utilize it to make judgments of appropriate professional behavior for issues directly addressed by the code.	Student can explain the ACM code and apply it to resolved non-controversial issues in professional behavior.	Student has a cursory understanding of some of the main points of the ACM code.
Legal	Students can summarize the legal issues, current law and evolving law regarding digital property, privacy and security.	Students can summarize the legal issues, current law and evolving law regarding two of digital property, privacy and security.	Students can summarize the legal issues but not current law regarding digital property, privacy and security.	Students can state some legal issues but not how they are resolved.

PLO: Function effectively as a member of a team in developing computing technology and solving technical problems.

Criterion	4: Exemplary	3: Accomplished	2: Developing	1: Beginning
Contributions	Routinely provides useful ideas when participating in the group and in classroom discussion. A definite leader who contributes a lot of effort.	Usually provides useful ideas when participating in the group and in classroom discussion. A strong group member who tries hard!	Sometimes provides useful ideas when participating in the group and in classroom discussion. A satisfactory group member who does what is required.	Rarely provides useful ideas when participating in the group and in classroom discussion. May refuse to participate.
Problem-solving	Actively looks for and suggests solutions to problems.	Refines solutions suggested by others.	Does not suggest or refine solutions, but is willing to try out solutions suggested by others.	Does not try to solve problems or help others solve problems. Lets others do the work.
Attitude	Never is publicly critical of the project or the work of others. Always has a positive attitude about the task(s).	Rarely is publicly critical of the project or the work of others. Often has a positive attitude about the task(s).	Occasionally is publicly critical of the project or the work of other members of the group. Usually has a positive attitude about the task(s).	Often is publicly critical of the project or the work of other members of the group. Often has a negative attitude about the task(s).
Focus on the task	Consistently stays focused on the task and what needs to be done. Very self-directed.	Focuses on the task and what needs to be done most of the time. Other group members can count on this person.	Focuses on the task and what needs to be done some of the time. Other group members must sometimes nag, prod, and remind to keep this person on-task.	Rarely focuses on the task and what needs to be done. Lets others do the work.
Working with others	Almost always listens to, shares with, and supports the efforts of others. Tries to keep people working well together.	Usually listens to, shares, with, and supports the efforts of others. Does not cause "waves" in the group.	Often listens to, shares with, and supports the efforts of others, but sometimes is not a good team member.	Rarely listens to, shares with, and supports the efforts of others. Often is not a good team player.