

CSCE A470: CS and CSE Outcomes Assessment

Computer Science	Computer Systems Engineering
Outcome 2: Analyze a problem, and identify and define the computing requirements appropriate to its solution.	Outcome B: An ability to design and conduct experiments, as well as analyze and interpret data
Outcome 3: Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs	Outcome C: An ability to design a system, component, or process to meet desired needs within realistic constraints.
Outcome 4: Function effectively on teams to accomplish a common goal. *** Skip this one	Outcome D: An ability to function on multi-disciplinary teams *** Skip this one
	Outcome E: An ability to identify, formulate, and solve engineering problems
Outcome 5: Demonstrate an understanding of professional, ethical, legal, security and social issues and responsibilities. *** I will evaluate based on the assignment but if you want to add more material here you can	Outcome F: An understanding of professional and ethical responsibility *** I will evaluate based on the assignment but if you want to add more material here you can
Outcome 6: Communicate effectively with a range of audiences, including technical and non-technical audiences for business, end-user, client, and computing contexts. *** I will evaluate you so don't self-evaluate	Outcome G: An ability to communicate effectively *** I will evaluate you so don't self-evaluate
Outcome 7: Analyze the local and global impact of computing on individuals, organizations, and society. *** I will evaluate based on the assignment but if you want to add more material here you can	Outcome H: The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context *** I will evaluate based on the assignment but if you want to add more material here you can
Outcome 8: Recognize the need for and an ability to engage in continuing professional development.	Outcome I: A recognition of the need for, and the ability to engage in, life-long learning
	Outcome J: A knowledge of contemporary issues
Outcome 9: Use current techniques, skills, and tools necessary for computing practice.	Outcome K: An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Outcome 10: Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.	
Outcome 11: Apply design and development principles in the construction of software systems of varying complexity.	

CS Outcome 1 and CSE Outcome A

Outcome 1: Apply knowledge of computing and mathematics appropriate to the discipline.
Outcome A: An ability to apply knowledge of mathematics, science, and engineering

Artifacts selected from CSCE A365 (Networking) and CSCE A311 (Automata & Algorithms)

Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Worked through a mathematical problem on computing	Did not attempt the problem	Attempted the problem with the correct starting point but the work and final answer was incorrect	Attempted the problem with the correct approach but the final answer was incorrect	Answered the problem correctly with the correct approach

CS Outcome 2 and CSE Outcome B

Outcome 2: Analyze a problem, and identify and define the computing requirements appropriate to its solution.
Outcome B: An ability to design and conduct experiments, as well as analyze and interpret data

Artifacts selected from CSCE A401 (Software Engineering) and CSCE A470 (Capstone)

Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Identifies and appropriately formulates requirements for the problem or experiment	No attempt or fails to summarize accurately	Summarizes but key details are missing or confused	Most details summarized and key relationships identified	Clearly identifies the challenge and embedded issues
2. Data analysis and collection	Unaware of modern data collection / fabrication techniques in their area	Able to use available data collection / fabrication techniques to a limited extent	Able to use available data collection / fabrication techniques	Evidence of analysis of design went well beyond expectations
3. Sufficient use of information sources	No evidence of combining or integrating information from multiple sources	Combined or integrated information from multiple sources to a limited extent	Combined or integrated information from multiple sources	Exceeded expectations in the ability to combine or integrate information from multiple sources

CS Outcome 3 and CSE Outcome C

Outcome 3: Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs. Outcome C: An ability to design a system, component, or process to meet desired needs within realistic constraints Artifacts selected from CSCE A401 (Software Engineering) and CSCE A470 (Capstone)				
Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Produces a reasonable design strategy, including tasks and subtasks, timelines, and evaluation of progress	Does not produce a design strategy, or the design strategy is especially poor	Limited attempts to form a design strategy	Produces a reasonable design strategy appropriate to the project	Produces an exceptional design strategy which exceeds expectations
2. Defines clear specifications and objectives with consideration for realistic constraints	Does not define specifications or objectives for the problem, and constraints are not considered.	Attempts to define specifications or objectives, but they are clear. Various constraints are also not addressed.	Defines clear specifications and objectives appropriate to the project. Constraints are sufficiently addressed.	Defines exceptionally clear specifications and objectives along with clear consideration for various constraints.
3. Creates a final product for evaluation	Does not create a final product, or the final product is especially poor	Makes a start on a final product but is unable to meet final specifications	Creates a satisfactory final product which meets defined specifications	Creates an exceptional final product which exceeds expectations
4. Performance on ETS Major Field Test in Computer Science, Systems Category	Lower 25 th percentile	25 th to 50 th percentile	50 th to 75 th percentile	75 th to 100 th percentile

CS Outcome 4 and CSE Outcome D

Outcome 4: Function effectively on teams to accomplish a common goal. Outcome D: An ability to function on multi-disciplinary teams. Artifacts selected from CSCE A401 (Software Engineering) and CSCE A470 (Capstone)				
Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Roles and responsibilities	Does not fulfill team role duties	Fulfills some, but not all, team role duties	Fulfills team role duties	Exceeds expectations with respect to team role duties
2. Listening and working with others	Does not consider other team members' ideas or concerns	Sometimes considers other team members' ideas or concerns	Often addresses other team members' ideas or concerns	Is exceptionally adept at addressing other team members' ideas or concerns
3. Group communication	Does not communicate to other members regarding the project progress	Provides terse outline of status of the project and relevant updates	Provides updates on a regular basis	Works exceptionally well to provide documentation of progress

CS Outcome 5 and CSE Outcome F

Outcome 5: Demonstrate an understanding of professional, ethical, legal, security and social issues and responsibilities.

Outcome F: An understanding of professional and ethical responsibility

Artifacts selected from CSCE A470 (Capstone)

Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Use of outside resources	Did not appear to have researched the question at all.	Drew on very little outside resources.	Mentioned a few outside resources.	Clear understanding of the question as drawn from outside resources.
2. Clear distinction between legal and ethical	Distinguished between legal and ethical issues.	Briefly mentioned legal and ethical issues.	Discussed both the legal and ethical issues related to the question.	Clearly discussed and distinguished between both the legal and ethical issues with the question.
3. Applicability to computing profession	The ethical question did not relate to computer professionals.	The ethical question may relate to computer professionals.	The ethical question relates to computer professionals sometimes.	The ethical question always relates to computer professionals.
4. Applicability to you personally	The ethical question does not have any impact on my life.	The ethical question may have an impact on my life in the future.	The ethical question may have an impact on my life.	The ethical question has or will have an impact on my life.

CS Outcome 6 and CSE Outcome G

Outcome 6: Communicate effectively with a range of audiences, including technical and non-technical audiences for business, end-user, client, and computing contexts.

Outcome G: An ability to communicate effectively

Artifacts selected from CSCE A401 (Software Engineering) and CSCE A470 (Capstone)

Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Organization & Structure	No logical structure	Some structure but erratic jumps in topic	Most information presented logically	All information presented logically
2. Content & Knowledge	No grasp of topic, cannot answer questions or extremely limited content	Only rudimentary knowledge demonstrated	At ease with content and provides some detail	Full command of subject matter
3. Effectively communicates details appropriate to the audience, including questions	Is unable to effectively communicate	Only able to answer/explain in a limited manner; limited detail	Provides sufficient detail to describe/answer questions	Communicates details exceptionally well
4. Visual aids and graphics	None	Weak support of the material, text or diagrams hard to see or understand	Mostly supports the material, most text and diagrams understandable	Text and diagrams strongly reinforce the presentation

5. Spelling and Grammar	Significant errors	Several errors	Minor errors	Negligible errors
6. Delivery and speaking skills	Significant delivery problems, little to no audience contact; much too long or much too short	Several mispronunciation, occasional audience contact; too long or too short	Clear voice, steady rate, some audience contact; slightly too long or too short	Clear voice, steady rate, strong audience contact, enthusiastic, confident; on time

CS Outcome 7 and CSE Outcome H

Outcome 7: Analyze the local and global impact of computing on individuals, organizations, and society. Outcome H: The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context				
Artifacts selected from CSCE A470 (Capstone)				
Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Identifies issues of economic, environmental and societal importance	Is unable to identify relevant economic, environmental and societal issues	Has a vague understanding of economic, environmental and societal issues	Demonstrates satisfactory knowledge of economic, environmental and societal issues	Demonstrates exceptional knowledge of economic, environmental and societal issues
2. Describes issues in a factually correct manner, supported with evidence, explained in sufficient detail and properly documented	Does not use facts when describing an issue, or does not support assertions with evidence or documentation	Makes limited use of supporting evidence and documentation when describing an issue	Satisfactorily describes issues in a factually correct manner, supported with evidence, explained in sufficient detail and properly documented	Exceeds expectations describing issues in a factually correct manner, supported with evidence, explained in sufficient detail and properly documented

CS Outcome 8 and CSE Outcome I

Outcome 8: Recognize the need for and an ability to engage in continuing professional development. Outcome I: A recognition of the need for, and the ability to engage in, life-long learning				
Artifacts selected from CSCE A320 (Operating Systems), CSCE A465 (Network Security) and CSCE A470 (Capstone)				
Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Understands the importance of staying current in fast-changing field of computing	Does not understand this importance	Has a vague understanding, and may not fully appreciate the need for continuous learning	Understands this importance and shows willingness to continue to learn beyond the BS program	Demonstrates exceptional knowledge of problems that arise with stagnation and is enthusiastic about life-long learning
2. Demonstrates independent learning and need for continuing education	No independent learning or interest in continuing education	Limited independent learning or interest in continuing education	Satisfactory independent learning and interest in	Significant independent learning and exceptionally detailed plan for

			continuing education	continuing education
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CS Outcome 9 and CSE Outcome K

Outcome 9: Use current techniques, skills, and tools necessary for computing practice.
Outcome K: An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Artifacts selected from CSCE A401 (Software Engineering), CSCE A465 (Network Security), and CSCE A470 (Capstone)

Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Use of tools	Unable to select appropriate tools, programming languages, and software/hardware components for developing the system	Able to select appropriate tools, programming languages, and software /hardware components to a limited extent	Able to select appropriate tools, programming languages, and software/hardware components	Exceeded expectations in seeking out and selecting appropriate tools, programming languages, and software/hardware components
2. Software/hardware techniques	Software/hardware techniques utilized incorrectly throughout, e.g. objects used incorrectly	Software/hardware techniques sometimes used incorrectly or inappropriately	Software/hardware techniques mostly used correctly and appropriately	Software/hardware techniques correctly and appropriately applied throughout

CS Outcome 10

Outcome 10: Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

Artifacts selected from CSCE A470 (Capstone) and ETS MFT

Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Integrates knowledge from other disciplines or CS sub-disciplines	A single viewpoint with no perspective	Roughly integrates multiple viewpoints, development methodologies, and software tools	Mostly integrates multiple viewpoints, development methodologies, and software tools	Fully integrates multiple viewpoints, development methodologies, and software tools
2. Algorithms, Data Structures or Database	Algorithms or data structures employed incompatible with the project	Inappropriate algorithms or data structures resulting in inefficiency or scalability problems	Mostly appropriate algorithms and data structures with some analysis for efficiency and scalability	Appropriate algorithms and data structures with analysis for efficiency and scalability
Performance on ETS Major Field Test in Computer Science, Theory Category	Lower 25 th percentile	25 th to 50 th percentile	50 th to 75 th percentile	75 th to 100 th percentile

CS Outcome 11

Outcome 11: Apply design and development principles in the construction of software systems of varying complexity.				
Artifacts selected from CSCE A470 (Capstone) and ETS MFT				
Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Software Design	No consideration given to the design of the system and architecture	Limited or inconsistent design principles, or inappropriate design	Mostly consistent use design principles and mostly appropriate design	Fully appropriate design, correctly implemented and documented
2. Usability	No consideration given to human usability factors	Little consideration, inconsistent	Some consideration, partially consistent	Serious consideration, fully consistent
3. Software Engineering and Testing	No software development methodology or testing utilized, "Code like Hell"	Limited software development methodology and testing	Mostly consistent in applying a software development and testing methodology	Fully consistent in applying a software development and testing methodology with project assessment
4. Code readability	Difficult to follow, no documentation	Some inline documentation, code possible to follow with effort	Code is understandable, major classes and algorithms documented	Code is very easy to follow and completely documented
5. Requirements and Project Scope/Complexity	Major requirements incomplete	Some requirements complete for high complexity, some requirements incomplete for low complexity	Major requirements complete for high complexity, all requirements complete for low complexity	All requirements complete, moderate or high complexity, usable system
Performance on ETS Major Field Test in Computer Science, Programming Category	Lower 25 th percentile	25 th to 50 th percentile	50 th to 75 th percentile	75 th to 100 th percentile

CSE Outcome E

Outcome E: An ability to identify, formulate, and solve engineering problems				
Artifacts selected from CSCE A365 (Networking) and CSCE A470 (Capstone)				
Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Identifies relevant known and unknown factors	Does not demonstrate understanding of known and unknown factors	Demonstrates limited understanding of known and unknown factors	Identifies expected known and unknown factors	Demonstrates exceptional insight in identifying known and unknown factors
2. Provides appropriate analysis of elements of the solution	In unable to provide analysis of the problem	Provides limited analysis of the problem	Provides satisfactory analysis of the problem	Provides analysis of the problem which exceeds expectations

3. Assesses the validity of the solution based on mathematical or engineering insight.	Makes no attempt to validate the solution, or validation method is completely incorrect	Makes limited attempts to validate the solution	Assesses the validity of the solution using an appropriate technique	Uses multiple techniques to assess validity of solution
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CSE Outcome J

Outcome J: A knowledge of contemporary issues. (CSE Interpretation: Knowledge of recent computer-related technology and research work)				
Artifacts selected from CSCE A320 (OS) and CSCE A470 (Capstone)				
Evaluation Criteria	Poor	Developing	Satisfactory	Excellent
1. Understands the latest developments and technical issues surrounding the paper topic	Does not understand the technical challenges / issues surrounding the topic.	Has a vague understanding of the technical issues and the latest developments	Demonstrates satisfactory knowledge of the technical issues and the latest developments	Demonstrates exceptional knowledge of the technical issues and the latest developments
2. Understands the related and future works	Has no knowledge of related, ongoing or future work.	Has limited knowledge of other related or ongoing work.	Aware of several related technical efforts and/or ongoing/continuous efforts.	Exceeds expectations in the knowledge of related works and ongoing projects.