

**University of Delaware General Education Rubrics**

**The Center for Teaching & Assessment of Learning**

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# UD General Education Purposes and Objectives

We seek to prepare students who are:

- Engaged citizens, involved in the world around them, and who understand the major challenges and debates of the day;
- Aware of their intellectual strengths and interests and of their ethical values and commitments;
- Capable of interpreting the arts and culture of contemporary and past societies; and,
- Equipped with the essential skills necessary to thrive in a rapidly evolving world including the ability to be a lifelong learner, creator, and innovator.

General education at the University of Delaware prepares students who are able to:

1. (a) Read critically, (b) analyze arguments and information, and (c) engage in constructive ideation.
2. Communicate effectively in (a) writing, (b) orally, and (c) through creative expression.
3. Work collaboratively and independently within and across a variety of cultural contexts and a spectrum of differences.
4. Critically evaluate the ethical implications of what they say and do.
5. Reason (a) quantitatively, (b) computationally, and (c) scientifically.

# Objectives definitions

**1a. Read Critically:** The process of simultaneously extracting and constructing meaning through interaction and involvement with written language. Students need to contextualize written content and respond to it effectively, differentiating their own contemporary and culturally influenced values from those expressed by another.

Example: In this course you will analyze the readings interpreting the texts and comparing the author's' viewpoints to your own. Your reflection papers that contain your analysis and responses to the readings will a portion of your final grade.

**1b. Analyze Arguments and Information:** The ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively and responsibly use and share that information for the problem at hand. Analyzing arguments requires breaking complex topics or issues into parts to gain a better understanding of them. Arguments may pose challenges to the values and beliefs of the student, requiring the student to reflect on their own attitudes and presumptions about our civilization or about the natural world, or perhaps about their place as an individual.

Example: In this course you will create an annotated bibliography that contains a short description or rationale for the citation in relation to your thesis.

**1c. Engage in Constructive Ideation:** Building new ideas and concepts, and contributing to the solution of **previously unsolved problems**.

Example: In this course your group will create a unique solution to an authentic problem that you identify for our campus community. Select your problem based upon the following criteria: It is a problem for the UD campus community, you can create a solution that is doable (minimal resources are needed), and the solution would provide impact. Be prepared to have a poster presentation where your team will present your solution and campus administrators will provide feedback.

**2a. Communicate Effectively in Writing:** The development and expression of ideas in writing. It involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences across the curriculum. A student with this skill will understand how to advance a credible argument using logical reasoning and the use of evidence; how to write with clarity and grace; how to account for different audiences and contexts; and how to employ the standard conventions of writing.

Example: In this course you will write a 5-7 page persuasive essay using APA citation, 12 point Times New Roman font, double spaced. Your paper will be evaluated on the following criteria: Controlling thesis, source selections, quality of sources, persuasiveness. This will count for a portion of your final grade.

**2b. Communicate Orally:** A prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors. A student with this skill will understand how to advance a credible argument using logical reasoning and the use of evidence; how to speak with clarity and grace; and how to account for different audiences and contexts.

Example: In this course, you will be evaluated on your ability to debate current political topics. Each student will select a topic from the hat and must come prepared to debate the topic from the “pro or con” perspective on the assigned date in the syllabus. This will count as a portion of your grade.

**2c. Communicate through Creative Expression:** Students will recognize and are able to communicate in a variety of media that go beyond the written and spoken word. These include forms of artistic and emerging forms of expression enabled by technology.

Example: In this course, you will create a video that captures your process from inception to delivery.

**3. Work Collaboratively and Independently Within and Across a Variety of Cultural Contexts and a Spectrum of Differences:** The development of skills to work independently and collaboratively across cultures and a spectrum of differences ensures that graduates will understand the limitations of a single perspective and the value of diverse perspectives and cultures in creative problem solving and the establishment of an engaged society. A student with these skills will be self-aware, respond to conflict in a productive way, and learn from diverse perspectives. Also essential are behaviors under the control of individual team members including how they facilitate contributions, and their manner of interacting with others on team.

Example: In this course you will need to work collaboratively to create a recommendation for a real world problem. Working as a member in the group, you need to be responsible to foster team discussions to work toward your group's goals. What will you do to ensure that all members of the group can share their opinions? Our classroom environment should be mutually respectful and inclusive of all students. The classroom should be an environment with no discrimination, where everyone is comfortable and at liberty to contribute to, and benefit from the entire learning experience. Any suggestions to improve class

interactions or any concerns should be brought to my attention. Your small group interactions in lecture, studio, and lab are a good way to adopt this attitude of inclusion and enhance positive interactions in the larger class.

**4. Critically Evaluate the Ethical Implications of What They Say and Do:** Reasoning about right and wrong human conduct. It requires students to be able to assess their own ethical values and the social context of problems, recognize ethical issues in a variety of settings, think about how different ethical perspectives might be applied to ethical dilemmas and consider the ramifications of alternative actions. Students' ethical self-identity evolves as they practice ethical decision-making skills and learn how to describe and analyze positions on ethical issues.

Example: In this First Year Experience course, you will identify how your actions or inactions as a bystander can affect the community where you live.

**5a. Reason Quantitatively:** The development of quantitative reasoning skills equips graduates to understand and interpret quantitative information presented in multiple forms and given in multiple contexts. A student with these skills will understand data, the visual presentation of data, the statistical analysis of data, as well as essential concepts such as exponential growth and the law of large numbers.

Example: In this course, you will create a question, gather data, analyze this data and represent it in a meaningful way such as a graph. This visual presentation of your data must be succinct, persuasive, and accurate.

**5b. Reason Computationally:** Computational thinking is a problem-solving process that includes (but is not limited to) the following characteristics: Formulating problems in a way that enables us to use a computer and other tools to help solve them; Logically organizing and analyzing data; Representing data through abstractions such as models and simulations; Automating solutions through algorithmic thinking (a series of ordered steps); Identifying, analyzing, and implementing possible solutions with the goal of achieving the most efficient and effective combination of steps and resources; Generalizing and transferring this problem-solving process to a wide variety of problems.

Example: In this course, we will use a big dataset to analyze the spread of the Zika virus and make predictions about its transmittal geographically as well as the economic, social and environmental impact.

**5c. Reason Scientifically:** The development of scientific reasoning skills equips graduates to understand the evaluation of evidence in modern science. A student with these skills will understand the scientific method, inductive and deductive thinking, causal reasoning, and how to evaluate the evidence for and against a scientific hypothesis or theory.

Example: In this course, you will test a hypothesis of your own choosing and provide feedback on your peers' abilities to reach a reasonable conclusion.

## UD Gen Ed Goal #1a: Read Critically Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
<b>Comprehension</b>	Contextualizes written content by making comparisons and connections beyond the author's explicit message (e.g., might recognize broader issues at play, or might pose challenges to the author's purpose, methods, data, findings and presentation might relate information to personal life experience).			Makes limited connections to other texts or experiences.
<b>Analysis of arguments</b>	Creates arguments to text that are logical and fully developed with supporting evidence and explicit connections to the text.			Presents arguments based on opinions with little supporting evidence.
<b>Reader's Voice</b> <i>Participating in academic discourse about texts</i>	Discusses texts (a) recognizing their own assumptions and (b) making connections from the text to the real world.			Comments about texts in ways that link texts to the assignment alone without a) personal interpretation or b) connections from the text to the real world.

## UD Gen Ed Goal #1b: Analyze Arguments and Information Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
<b>Determines the Extent of Information Needed</b>	(a) Effectively defines required information within the context of a research question, thesis or problem, (b) identifies key arguments, <b>and</b> (c) identifies specific types of information (sources) needed to answer research question.			Poorly defines (a) the information required to address a research question or thesis, (b) fails to identify key arguments, and (c) does not understand the types of information (sources) available or necessary to answer research question.
<b>Accesses the Necessary Information</b>	Accesses information using effective, well-designed search strategies and the most appropriate (i.e. relevant, high quality) information sources.			Accesses information randomly and retrieves information that lacks relevance and quality.
<b>Collects Appropriate evidence</b> <i>Selects and uses information to investigate a point of view or conclusion</i>	Interprets and evaluates information from sources to develop a comprehensive analysis or synthesis, thoroughly questioning the viewpoints of experts.			Takes information from source(s) without any interpretation/evaluation, including taking the viewpoints of experts as fact without question.
<b>Evaluates Information and its Sources Critically</b>	(a) Chooses a variety of information sources appropriate to the scope and discipline of the research question and (b) selects sources after considering the importance to the researched topic of the multiple criteria used (such as relevance to the research question, currency, authority, audience, and bias or point of view).			(a) Chooses a few information sources and (b) selects sources using limited criteria (such as relevance to the research question without balanced representation of positions).
<b>Understands Limitations and Implications</b>	(a) Insightfully discusses in detail relevant and supported limitations and implications taking into account the complexities of an issue, (b) acknowledges limits of position, and (c) synthesizes others' points of view within position (perspective, thesis/hypothesis).			Presents irrelevant or unsupported limitations and implications.

## UD Gen Ed Goal #1c: Engage in Constructive Ideation Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
<b>Solves Problems</b>	Considers multiple approaches that result in a logical, consistent solution that solves a problem.			Relies on a single approach or proposes a solution that illogical or inconsistent.
<b>Recognizes Consequences</b>	Explicitly describes the complex and interconnected consequences of a potential solution.			Relies on surface-level description or presents disconnected consequences of a potential solution.
<b>Provides Justifications</b>	Articulates well-reasoned and well-connected justifications for choosing the solution.			Relies on inadequate and disconnected justifications for the chosen solution..
<b>Thinks Innovatively</b>	Extends or connects novel or unique ideas, questions, formats, or products to create new knowledge or knowledge that crosses boundaries.			Reuses existing ideas without transforming or connecting them in new ways.
<b>Takes Risks</b> <i>May include personal risk (fear of embarrassment or rejection) or risk of failure in successfully completing assignment, i.e. going beyond original parameters of assignment, introducing new materials and forms, tackling controversial topics, advocating unpopular ideas or solutions, etc.</i>	Actively seeks out and utilizes untested and potentially risky approaches to the assignment in the final product.			Relies on well-tested, well-known ideas, approaches, and solutions without considering any extensions or innovations.
<b>Embraces Contradictions</b>	Integrates alternate, divergent, or contradictory perspectives or ideas fully.			Briefly mentions but does not integrate alternate, divergent, or contradictory perspectives or ideas.

## UD Gen Ed Goal #2a: Communicate Effectively in Writing Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
<b>Central Message</b>	Central message is compelling to audience: precisely stated, appropriately repeated, memorable, and strongly supported.			Demonstrates minimal attention to context, audience, purpose, and to the assigned tasks(s) (e.g., expectation of instructor or self as audience).
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is (a) clear, logical and consistently observable, (b) skillful in making content cohesive, and (c) is aligned with the conventions particular to the specific discipline, audience, or context.			Attempts to use a consistent system for basic organization and presentation.
<b>Sources and Evidence</b>	Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas.			Demonstrates an attempt to use sources to support ideas in the writing.
<b>Appropriate Language and Delivery</b>	Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.			Uses language that sometimes impedes meaning or fluency because of usage errors.



## UD Gen Ed Goal #2b: Communicate Orally Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
<b>Central Message</b>	Central message is compelling to audience: precisely stated, appropriately repeated, memorable, and strongly supported.			Demonstrates minimal attention to context, audience, purpose, and to the assigned tasks(s) (e.g., expectation of instructor or self as audience).
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions): (a) communication is logical, clear and consistent, (b) cohesive content presents different but related aspects of the central message; material is well-connected with effective transitions <b>and</b> (c) content is aligned with the conventions particular to the specific discipline, audience, or context.			Attempts to use a consistent system for basic organization and presentation.
<b>Sources and Evidence</b>	Demonstrates proficient use of high-quality, credible, relevant sources to develop ideas.			Demonstrates an attempt to use sources to support ideas in the writing.
<b>Language</b>	Spoken language delivered with clarity. Language choices are memorable, compelling, and enhance the effectiveness of the presentation.  Language in presentation is appropriate to audience members.			Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	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) detract from the clarity of the presentation, and speaker appears uncomfortable.

## UD Gen Ed Goal #2c: Communicate through Creative Expression Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
<b>Central Message</b>	Central message is compelling: precisely stated, appropriately repeated, memorable, and strongly supported.			Demonstrates minimal attention to context, audience, purpose, and to the assigned tasks(s) (e.g., expectation of instructor or self as audience).
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is (a) logical, clearly and consistently observable, (b) skillful in making content cohesive, and (c) is aligned with the conventions particular to the specific discipline, audience, or context.			Attempts to use a consistent system for basic organization and presentation.
<b>Sources and Evidence</b>	Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas.			Demonstrates an attempt to use sources to support ideas in the writing.
<b>Selection and Use of Medium</b>	Medium - dance, sculpture, painting, etc. - is skillfully executed and effectively supports the message.			Medium is poorly executed with little consideration for its intended support of the message.

### UD Gen Ed Goal #3: Work Collaboratively and Independently Within and Across a Variety of Cultural Contexts and a Spectrum of Differences Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
<b>Facilitates the Contributions of Team Members</b>	Engages team members actively in ways that facilitate their contributions to meetings by (a) constructively building upon or synthesizing the contributions of others <b>and</b> (b) noticing and inviting engagement when someone is not participating.			Engages team members passively by taking turns and listening to others without interrupting.
<b>Fosters Collaborative Team Climate</b>	Supports a constructive team climate by (a) treating team members respectfully through polite and constructive communication, (b) using positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work, (c) motivating teammates by expressing confidence about the importance of the task and the team's ability to accomplish it, <b>and</b> (d) providing assistance and/or encouragement to team members.			Supports a constructive team climate by doing only <b>one</b> of the following: (a) treating team members respectfully through polite and constructive communication, (b) using positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work, (c) motivating teammates by expressing confidence about the importance of the task and the team's ability to accomplish it, <b>or</b> (d) providing assistance and/or encouragement to team members.
<b>Responds to Conflict</b>	Addresses destructive conflict directly and constructively, helping to manage/resolve it in a way that strengthens overall team cohesiveness and future effectiveness.			Ignores or refuses to address destructive conflict.
<b>Exhibits Self-Awareness</b>	Acknowledges one's own perspectives, biases, strengths, and limitations. Increases team effectiveness by identifying insights about self and deferring to other group members.			Acknowledges some connections between one's own perspectives and the work of the group.
<b>Incorporates Diverse Perspectives</b>	Evaluates and applies diverse perspectives to complex issues in the face of multiple and even conflicting positions.			Identifies multiple perspectives while maintaining a preference for own positioning.
<b>Recognizes Cultural Contexts/Spectrum of Differences</b>	Demonstrates significant openness or multiple worldviews, experiences, and power structures while initiating meaningful interaction with others.			Describes the experiences of others primarily through their own cultural perspective, demonstrating limited openness to others.



## Multicultural Course Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
Diversity Self-Awareness and Perspective Taking	Articulates own individual identity in relation to key concepts such as race, ethnicity, gender, sexuality, language, social class, disability, national origin, and religious affiliation, and can also reflect on how their social position differs from, and impacts, their relationships in diverse environments.			Articulates own individual identity but lacks understanding of how their position differs from and can impact other relationships.
Cultural Difference	Demonstrated knowledge of the history, lived experience, artistic production, identity and/or worldview of one or more underrepresented groups in the West (i.e., the US, Great Britain, Europe, Canada, Australia, New Zealand) and/or of a non-Western culture (or cultures). Students can articulate particular aspects and experiences of these cultures as well as how they may be similar to or different than the students' own.			Can articulate cultural differences but does so simply from a historical lens. Makes no reference to the underrepresented status of a group.
Personal and Social Responsibility	Analyzes the ethical, social, and/or environmental consequences of policies, ideologies, or actions on marginalized communities/groups within the US or internationally. Based on this analysis, students identify a range of potential personal and civic responses to these issues.			Superficial analysis that provides facts but little civic response.
Understanding Global Systems	Systematically evaluates how institutions, ideologies, rhetoric, and/or cultural representations shape a people's culture and identity, which may include their role in perpetuating inequality, whether historically or in the present day.			Evaluates institutions but maintains personal lens without demonstrating an understanding of systems that perpetuate inequality.

### UD Gen Ed Goal #4: Critically Evaluate the Ethical Implications of What They Say and Do Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
<b>Demonstrates Ethical Self-Awareness</b>	Clearly identifies own ethical positions with awareness of potential limitations and fallibility of these positions.			(a) Cannot articulate ethical position or identify their own ethical positions. (b) Demonstrates little awareness of potential limitations and fallibility of their positions.
<b>Understands Different Ethical Perspectives</b>	Recognizes complexity and accepts the existence of a multiplicity of perspectives.			Expresses unwillingness to consider multiple perspectives.
<b>Recognizes Ethical Issues</b>	Effectively recognizes ethical issues and their interrelatedness in complex topics or problems.			Recognizes basic and obvious ethical issues but fails to grasp complexity or interrelatedness in complex topics or problems.
<b>Applies Ethical Perspectives</b>	(a) Rationally, independently, and accurately applies ethical perspectives to an ethical question and (b) is able to articulate possible implications for self and others.			Applies ethical perspectives to an ethical question with support using prepared examples (i.e. in a class, in a group, or a fixed-choice setting) but is unable to (a) apply ethical perspectives independently to a new example and (b) does not consider implications for others.
<b>Evaluates Different Ethical Perspectives</b>	States a contrasting perspective on an ethical issue and can comprehensively state the assumptions, strengths, and limitations of the different position.			States a contrasting perspective but cannot state the assumptions, strengths, and limitations of the different position.
<b>Demonstrates Social Empathy</b>	Identifies potential local, national, or global social implications of ethical issues beyond implications to self.			Identifies only implications to self of ethical issues which have potential local, national, or global social implications .

## UD Gen Ed Goal #5a: Reason Quantitatively Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
<b>Interpretation</b> <i>Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)</i>	(a) Provides accurate explanations of information presented in mathematical forms and (b) makes appropriate inferences based on that information. <i>For example, accurately explains the trend data shown in a graph and makes reasonable predictions regarding what the data suggest about future events.</i>			Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means. <i>For example, attempts to explain the trend data shown in a graph, but will frequently misinterpret the nature of that trend, perhaps by confusing positive and negative trends.</i>
<b>Representation</b> <i>Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)</i>	Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.			Completes conversion of information but the resulting mathematical portrayal is inappropriate or inaccurate.
<b>Calculation</b>	(a) Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem and (b) calculations are also presented elegantly (clearly, concisely, etc.)			Calculations are attempted but are both unsuccessful and are not comprehensive.
<b>Application / Analysis</b> <i>Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis</i>	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.			Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work.
<b>Assumptions</b> <i>Ability to make and evaluate important assumptions in estimation, modeling, and data analysis</i>	(a) Explicitly describes assumptions and provides compelling rationale for why each assumption is appropriate and (b) shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions.			Attempts to describe assumptions.
<b>Communication</b> <i>Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)</i>	(a) Uses quantitative information in connection with the argument or purpose of the work, (b) presents it in an effective format, and (c) explicates it with consistently high quality.			Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (May use quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities.)

## UD Gen Ed Goal #5a: Reason Quantitatively Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
<b>Interpretation</b> <i>Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)</i>	(a) Provides accurate explanations of information presented in mathematical forms and (b) makes appropriate inferences based on that information. <i>For example, accurately explains the trend data shown in a graph and makes reasonable predictions regarding what the data suggest about future events.</i>			Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means. <i>For example, attempts to explain the trend data shown in a graph, but will frequently misinterpret the nature of that trend, perhaps by confusing positive and negative trends.</i>
<b>Representation</b> <i>Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)</i>	Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.			Completes conversion of information but the resulting mathematical portrayal is inappropriate or inaccurate.
<b>Calculation</b>	(a) Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem and (b) calculations are also presented elegantly (clearly, concisely, etc.)			Calculations are attempted but are both unsuccessful and are not comprehensive.
<b>Application / Analysis</b> <i>Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis</i>	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.			Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work.
<b>Assumptions</b> <i>Ability to make and evaluate important assumptions in estimation, modeling, and data analysis</i>	(a) Explicitly describes assumptions and provides compelling rationale for why each assumption is appropriate and (b) shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions.			Attempts to describe assumptions.
<b>Communication</b> <i>Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)</i>	(a) Uses quantitative information in connection with the argument or purpose of the work, (b) presents it in an effective format, and (c) explicates it with consistently high quality.			Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (May use quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities.)



## UD Gen Ed Goal #5b: Reason Computationally Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
<b>Decomposition</b> <i>Break down tasks into smaller, manageable parts</i>	Correctly decomposes a complex problem into efficient, clearly described, well-defined, and distinct-but-related constituent subproblems.			Describes the characteristics of a problem that can be broken into distinct-but-related constituent subproblems.
<b>Data</b> <i>Represents data elements to facilitate discovery of connections and patterns</i>	Creates an accurate representation of information by identifying the essential inputs, outputs, and intermediate products necessary to solve the problem. Finds similarities and disregards unimportant differences in data elements. Reduces the data to their most simplified and efficient form.			Describes the advantages and disadvantages of different means of representing, storing, retrieving, and linking data.
<b>Algorithms</b> <i>Uses a series of ordered steps to solve a problem or achieve some goal</i>	Creates an accurate, logical, and efficient sequence of steps or instructions to accomplish a task or solve a problem.			Describes an algorithm with an understanding of its different steps..
<b>Abstraction</b> <i>Reduces complexity to simplify the main idea and use in different contexts</i>	Creates an accurate representation of a process or group of objects. Selects the essential characteristics. Finds similarities and disregards unimportant differences in processes or objects. Reduces a process or group of objects to a simplified representation with consideration for extending the representation to other similar problems. Ex. You could create a library of key operational characteristics.			Describes how a process or object can be reduced to its simplest form by removing or omitting unimportant characteristics. Sees the similarities and differences.
<b>Programming</b> <i>Implements a solution to problem using concepts such as sequencing, conditionals, repetition, and logic concepts</i>	Evaluates a program with respect to certain properties.			Describes what a program achieves or performs.

## UD Gen Ed Goal #5c: Reason Scientifically Rubric

	Capstone	Milestones		Benchmark
	4	3	2	1
<b>Defines Problem</b>	Demonstrates the ability to construct a clear and insightful problem statement with evidence of relevant contextual factors.			Demonstrates a limited ability to identify a problem statement or related contextual factors.
<b>Identifies Strategies</b>	Identifies multiple approaches for solving a problem that apply within a specific context.			Identifies one or more approaches for solving the problem, but approaches do not apply within a specific context.
<b>Proposes Solutions/Hypotheses</b>	Proposes one or more solutions/hypotheses that indicate a deep comprehension of the problem. Contextual factors, as well as ethical, logical, and cultural dimensions of the problem are taken into account when determining a solution/ hypothesis.			Proposes a solution/hypothesis that is difficult to evaluate because it is vague or only indirectly addresses the problem statement.
<b>Evaluates Potential Solutions</b>	Evaluation of solutions is deep and elegant (for example, contains thorough and insightful explanation) and includes thorough incorporation of all of the following: history of problem, logic and reasoning toward solution, feasibility of solution, and impacts of solution.			Evaluation of solutions is superficial, containing cursory, surface level explanations and includes some of the following: history of problem, logic/ reasoning, feasibility of solution, and impacts of solution.
<b>Implements Solution/s</b>	Implements the solution in a manner that thoroughly addresses multiple contextual factors of the problem.			Implements the solution in a manner that does not directly address the problem statement or only addresses one contextual factor of the problem.
<b>Evaluates Outcomes</b>	Interprets results relative to the problem defined with thorough, specific considerations of need for further work.			Interprets results superficially in terms of the problem defined with no consideration of need for further work