RCC
Rogue Community College

GUIDELINES FOR CREATING AND REVISING COURSE OUTLINES 2022-23

INTRODUCTION

The course outline is the official document on file with RCC for a course. Course outlines must follow a specific format and contain some standard information and language. This guide provides information on how to prepare a course outline for submission to the Curriculum and Scheduling Department. Course outlines **must** be updated every three years.

New Course Proposals: If you plan to create a new credit course, work with the Dean of Curriculum and Instruction as you begin the process. Department chairs/faculty will need to prepare the course outline and present it to the Curriculum and Academic Standards Committee (CASC) for approval.

Existing Courses: ALL course outline changes need to go to CASC for approval.

Please DO NOT save course outlines directly to the Y drive or copy over any existing outline saved there. Send all course outlines to Denise Kerr (dkerr@roguecc.edu), Data Management Specialist in Curriculum and Scheduling (x7297).

The next few pages contain a template for course outlines. **Please check the format and make sure that the course outline you will submit fits that format**. The italicized text is information for your attention or information that you need to fill in for the specific course. Following the template are several documents referred to in the text in red in the three-column table.

Course No. _____

Credits:_____

Date: *Month/year**

Note: Course outlines **must be updated, at a minimum, every three years.*

Course Title:

Institution: Rogue Community College

Type of Course: *(Example: Post-secondary Remedial, Transfer, Occupational Preparatory, Occupational Supplementary, etc.)*

Length of Course: A minimum of *XX (xx)* lecture or lab hours for one term.

Prerequisites: *(List all prerequisite courses and/or placement requirements.)*

Department Assignment:

Course Description: *[Make sure this description matches the one in the published RCC catalog. Use Track Changes to present edits to be incorporated into the upcoming catalog.]*

Institutional Learning Outcomes (ILO):

Communication (COM)	Students will engage in effective communication using active reading and listening skills and expressing ideas appropriately in oral, written, and visual work.
Critical Thinking (CT)	Students will explore, reach, and support appropriate conclusions through the analysis, synthesis, and evaluation of information and varying opinions.
Equity, Diversity, Inclusion and Global Consciousness (EDI & GC)	Students will recognize and identify equity, diversity, inclusion and global consciousness as it applies to people and the world today.
Information Literacy (IL)	Students will identify an information need and locate, evaluate, and use information effectively and ethically.
Quantitative Literacy and Reasoning (QL & R)	Students will reason through and solve quantitative problems by collecting and interpreting data, and applying mathematical/statistical techniques.

Course Learning Outcomes, Assessment Methods, and ILO:

Course Learning Outcomes	ILO
NOTE TO DEPARTMENTS: *Each CLO should begin with an active verb and describe what students should be able to DO as a result of taking this class. See "Scoring Guide for Assessing the Quality of Intended Outcome Statements" to evaluate statements.*	*NOTE TO DEPARTMENTS:* *Choose the best place to align an ILO most closely with CLO.* *Usually this is one or two ILOs per course, depending on how many course learning outcomes. Choose the ones that are meaningful for the course and the department and are aligned with a specific assignment and course outcome.*
1.	1. Equity, Diversity, Inclusion and Global Consciousness *For example*
2.	2.
3.	3.
4. Continue listing each CLO.	*4.*

Typical Required and Recommended Text(s):

Typical Required and Recommended Equipment and Materials:

COURSE CONTENT

In this section, list the course content – the concepts that the students must understand and the skills and processes that they must master in order to meet the CLOs. Ideally, the selection of essential content and skills is driven by the CLOs and assessment methods rather than a predetermined list of topics from a textbook table of contents.

Do NOT list content as Week 1, Week 2, Week 3, etc., as it implies the course is limited to terms of that length.

REFERENCE DOCUMENTS FOR

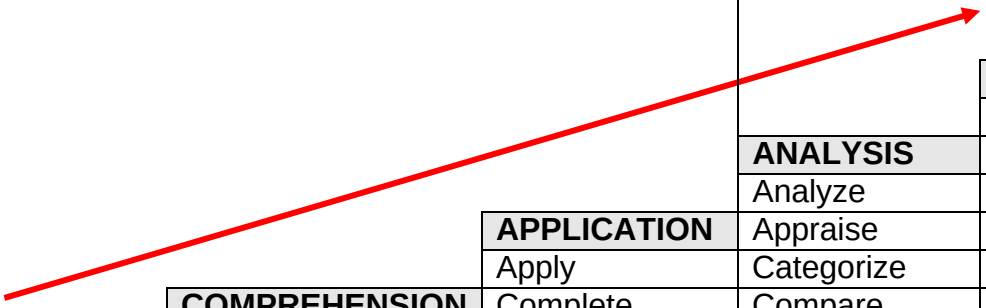
CREATING OR REVISING

COURSE OUTLINES

Bloom's Taxonomy of Measurable Verbs

Benjamin Bloom created a taxonomy of measurable verbs to help us describe and classify observable knowledge, skills, attitudes, behaviors and abilities. The theory is based upon the idea that there are levels of observable actions that indicate something is happening in the brain (cognitive activity.) By creating learning objectives using measurable verbs, you indicate explicitly what the student must do in order to demonstrate learning.

Verbs that demonstrate *Critical Thinking*



KNOWLEDGE	COMPREHENSION	APPLICATION	ANALYSIS	SYNTHESIS	EVALUATION
					Appraise
				SYNTHESIS	Argue
				Arrange	Assess
			ANALYSIS	Assemble	Choose
			Analyze	Collect	Compare
		APPLICATION	Appraise	Combine	Conclude
		Apply	Categorize	Comply	Estimate
	COMPREHENSION	Complete	Compare	Compose	Evaluate
	Compare	Construct	Contrast	Construct	Interpret
KNOWLEDGE	Describe	Demonstrate	Debate	Create	Judge
List	Discuss	Dramatize	Diagram	Design	Justify
Name	Explain	Employ	Differentiate	Devise	Measure
Recall	Express	Illustrate	Distinguish	Formulate	Rate
Record	Identify	Interpret	Examine	Manage	Revise
Relate	Recognize	Operate	Experiment	Organize	Score
Repeat	Restate	Practice	Inspect	Plan	Select
State	Tell	Schedule	Inventory	Prepare	Support
Tell	Translate	Sketch	Question	Propose	Value
Underline		Use	Test	Setup	

Bloom's Taxonomy Action Verbs

Definitions	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
Bloom's Definition	Remember previously learned information.	Demonstrate an understanding of the facts.	Apply knowledge to actual situations.	Break down objects or ideas into simpler parts and find evidence to support generalizations.	Compile component ideas into a new whole or propose alternative solutions.	Make and defend judgments based on internal evidence or external criteria.
Verbs	• Arrange • Define • Describe • Duplicate • Identify • Label • List • Match • Memorize • Name • Order • Outline • Recognize • Relate • Recall • Repeat • Reproduce • Select • State	• Classify • Convert • Defend • Describe • Discuss • Distinguish • Estimate • Explain • Express • Extend • Generalized • Give example(s) • Identify • Indicate • Infer • Locate • Paraphrase • Predict • Recognize • Rewrite • Review • Select • Summarize • Translate	• Apply • Change • Choose • Compute • Demonstrate • Discover • Dramatize • Employ • Illustrate • Interpret • Manipulate • Modify • Operate • Practice • Predict • Prepare • Produce • Relate • Schedule • Show • Sketch • Solve • Use • Write	• Analyze • Appraise • Breakdown • Calculate • Categorize • Compare • Contrast • Criticize • Diagram • Differentiate • Discriminate • Distinguish • Examine • Experiment • Identify • Illustrate • Infer • Model • Outline • Point out • Question • Relate • Select • Separate • Subdivide • Test	• Arrange • Assemble • Categorize • Collect • Combine • Comply • Compose • Construct • Create • Design • Develop • Devise • Explain • Formulate • Generate • Plan • Prepare • Rearrange • Reconstruct • Relate • Reorganize • Revise • Rewrite • Set up • Summarize • Synthesize • Tell • Write	• Appraise • Argue • Assess • Attach • Choose • Compare • Conclude • Contrast • Defend • Describe • Discriminate • Estimate • Evaluate • Explain • Judge • Justify • Interpret • Relate • Predict • Rate • Select • Summarize • Support • Value

Bloom's Taxonomy Verbs

Use verbs aligned to Bloom's Taxonomy to create discussion questions and lesson plans that ensure your students' thinking progresses to higher levels.

Knowledge		Comprehend	
Count	Read	Classify	Interpret Cite
Define	Recall		Locate
Describe	Recite	Conclude	Make sense of
Draw	Record	Convert	Paraphrase
Enumerate	Reproduce	Describe	Predict
Find	Select	Discuss	Report
Identify	Sequence	Estimate	Restate
Label	State	Explain	Review
List	Tell	Generalize	Summarize
Match	View	Give examples	Trace
Name	Write	Illustrate	
Quote			

Apply		Analyze	
Act	Imitate	Break down	Focus
Administer	Implement	Characterize	Illustrate
Articulate	Interview	Classify	Infer
Assess	Include	Compare	Limit
Change	Inform	Contrast	Outline
Chart	Instruct	Correlate	Point out
Choose	Paint	Debate	Prioritize
Collect	Participate	Deduce	Recognize
Compute	Predict	Diagram	Research
Construct	Prepare	Differentiate	Relate
Contribute	Produce	Discriminate	Separate
Control	Provide	Distinguish	Subdivide
Demonstrate	Relate	Examine	
Determine	Report		
Develop	Select		
Discover	Show		
Dramatize	Solve		
Draw	Transfer		
Establish	Use		
Extend	Utilize		

Synthesize		Evaluate	
Adapt	Intervene	Appraise	Interpret
Anticipate	Invent	Argue	Judge
Categorize	Make up	Assess	Justify
Collaborate	Model	Choose	Predict
Combine	Modify	Compare & Contrast	Prioritize
Communicate	Negotiate	Conclude	Prove
Compare	Organize	Criticize	Rank
Compile	Perform	Critique	Rate
Compose	Plan	Decide	Reframe
Construct	Pretend	Defend	Select
Contrast	Produce	Evaluate	Support
Create	Progress		
Design	Propose		
Develop	Rearrange		
Devise	Reconstruct		
Express	Reinforce		
Facilitate	Reorganize		
Formulate	Revise		
Generate	Rewrite		
Incorporate	Structure		
Individualize	Substitute		
Initiate	Validate		
Integrate			

Knowledge	
Useful Verbs	**Sample Question Stems**
Tell List Describe Relate Locate Write Find State Name	What happened after...? How many...? Who was it that...? Can you name the...? Describe what happened at...? Who spoke to...? Can you tell why...? Find the meaning of...? What is...? Which is true or false...?

Comprehension	
Useful Verbs	**Sample Question Stems**
explain interpret outline discuss distinguish predict restate translate compare describe	Can you write in your own words...? Can you write a brief outline...? What do you think could of happened next...? What do you think...? Can you distinguish between...? What differences exist between...? Can you provide an example of what you mean...? Can you provide a definition for...?

Application	
Useful Verbs	**Sample Question Stems**
Solve Show Use Illustrate Construct Complete Examine Classify	Do you know another instance where...? Could this have happened in...? Can you group by characteristics such as...? What factors would you change if...? Can you apply the method used to some experience of your own...? What questions would you ask of...? From the information given, can you develop a set of instructions about...? Would this information be useful if you had a ...?

Analysis	
Useful Verbs	**Sample Question Stems**
Analyze Distinguish	Which events could have happened...? How was this similar to...?

Synthesis	
Useful Verbs	**Sample Question Stems**
Create Invent Compose Predict Plan Construct Design Propose Devise Formulate	Can you design a ... to ...? Can you see a possible solution to...? If you had access to all resources how would you deal with...? What would happen if...? How many ways can you...? Can you create new and unusual uses for...? Can you develop a proposal which would...?

Evaluation	
Useful Verbs	**Sample Question Stems**
Judge Select Choose Decide Justify Debate Verify Argue Recommend Assess Discuss Rate Prioritize Determine	Is there a better solution to... ? Judge the value of... ? Can you defend your position about...? Do you think ... is a good or a bad thing? How would you have handled...? What changes to ... would you recommend? Do you believe….? How effective are...? What do you think about...?

Watch Out for Verbs that are not Measurable

In order for an objective to give maximum structure to instruction, it should be free of vague or ambiguous words or phrases. The following lists notoriously ambiguous words or phrases which should be avoided so that the intended outcome is concise and explicit.

WORDS TO AVOID	PHRASES TO AVOID
• *Believe* • *Hear* • *Realize* • *Capacity* • *Intelligence* • *Recognize* • *Comprehend* • *Know* • *See* • *Conceptualize* • *Listen* • *Self-Actualize* • *Memorize* • *Think* • *Experience* • *Perceive* • *Understand* • *Feel*	**Evidence a (n): To Become: To Reduce:** *Appreciation for* *Acquainted with* *Adjusted to* *Awareness of* *Capable of* *Comprehension of .* *Cognizant of* *Enjoyment of* *Conscious of* *Familiar with* *Interest in* *Interested in .* *Knowledge of* *Knowledgeable about .* *Understanding of*

Communication[1]

Definition: Communication is the purposeful exchange of ideas and information through speech, writing, or other means.

Outcome: Students will engage in effective communication using active reading and listening skills and expressing ideas appropriately in oral, written, and visual work.

Indicators	Benchmark (1)	Milestone (2)	Milestone (3)	Capstone (4)
Language and Conventio	Communicates in clear, though often simple sentences, with frequent errors i grammar and mechanics that at times impede meaning. Shows a basic comprehension of the conventions of or and written communication, though wit fairly simple vocabulary and an uneven inconsistent voice and style.	Communicates in clear, often comp sentences, with occasional errors in grammar and mechanics that do not impede meaning. Shows a developi comprehension of the conventions o oral and written communication, wi a broad vocabulary and a generally consistent voice and style.	Communicates in clear, complex sentences with few if any errors in grammar and mechanics. Shows attention to word choice, a consisten voice and style, and a developed comprehension of the conventions o oral and written communication.	Communicates in clear, fluent sentence that are virtually free of errors in gramn and mechanics. Uses complex, memora language that demonstrates a comprehensive vocabulary; thoughtful, articulate expression; and a confident voice and style.
Awareness of Purpose an Audience	Demonstrates some attention to audienc purpose, and to the assigned task(s). W shows a basic comprehension of organization and genre.	Demonstrates awareness of audienc perceptions and assumptions, and th purpose of the assigned task(s). Wo shows a developing awareness of organization and genre, though with room for improvement.	Demonstrates consideration of audience and purpose and a clear focus on the assigned task(s). Work generally organized and adheres to t appropriate genre.	Demonstrates a thorough comprehensio of audience, purpose, and genre that is responsive to the assigned task(s). All elements of the work are organized and focused.
Evidence and Support	Demonstrates basic facility in supportir ideas appropriate to the task(s), but establishes minimal credibility or comprehension of the topic. Limited us of other perspectives as support.	Uses adequate supporting ideas appropriate to the task(s) which establish some credibility and show basic comprehension of the topic. Incorporates outside sources as support, but with little attention to t conventions of research and citation	Uses supporting ideas appropriate to the task(s) which establish credibilit and show a thorough comprehensio of the topic. Integrates outside sourc as support, following the convention of research and citation.	Synthesizes a variety of complex supporting ideas which establish topica authority and demonstrate original thinking. Sophisticated integration of outside sources with strict attention to t conventions of research and citation.
Delivery (for Oral Communication)	Uses basic delivery techniques (body language, eye contact, movement, and vocal qualities) that occasionally distrac from the meaning of a message and suggest some discomfort and lack of preparation for the speaking situation.	Uses appropriate delivery technique (body language, eye contact, movement, and vocal qualities) that not distract from the meaning of a message and suggest some comfort and preparation for the speaking situation.	Uses interesting delivery techniques (body language, eye contact, movement, and vocal qualities) that complement the meaning of a messa and suggest comfort and preparation for the speaking situation.	Uses compelling delivery techniques (body language, eye contact, movemen and vocal qualities) that significantly enhance the meaning of a message and suggest confidence, poise, and substant preparation for the speaking situation.

1 *This rubric was created using the Association of American Colleges and Universities (AAC&U) Critical Thinking VALUE Rubric. Retrieved from* https://www.aacu.org/value-rubrics

Critical Thinking Rubric[2]

Definition: Critical thinking is a habit of mind characterized by the exploration of evidence before formulating a conclusion.
Outcome: Students will explore, reach, and support appropriate conclusions through the analysis, synthesis, and evaluation of information and varying opinions.

Indicators	Benchmark (1)	Milestone (2)	Milestone (3)	Capstone (4)
Analysis of Information, Ideas, and Concepts.	Issue to be considered critically is stated without clarification or description.	Issue to be considered critically is stated but description leaves some ambiguities unexplored.	Issue to be considered critically is stated clearly and described comprehensively, delivering most relevant information necessary for full understanding.	Issue to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.
Uses information to investigate various perspectives. Raises significant or relevant questions.	Information is taken from source(s) without any interpretation. Viewpoints of experts are taken as fact, without question.	Information is taken from source(s) with some interpretation, but not enough to develop a coherent synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) with enough interpretation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with enough interpretation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.
Influence of context and assumptions.	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Thoroughly analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.
Application of Synthesis.	Specific position is stated, but is simplistic and obvious.	Specific position acknowledges different sides of an issue.	Specific position takes into account the complexities of an issue. Others' points of view are acknowledged within position.	Specific position is imaginative, taking into account the complexities of an issue. Limits of position are acknowledged. Others' points of view are synthesized within position.
Conclusion(s) and related outcomes.	Conclusion is inconsistently tied to some of the information discussed; related outcomes are oversimplified.	Conclusion is logically tied to information. Some related outcomes are identified clearly.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes are identified clearly.	Conclusions and related outcomes are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.

2 *This rubric was created using the Association of American Colleges and Universities (AAC&U) Critical Thinking VALUE Rubric. Retrieved from* https://www.aacu.org/value-rubrics

Equity, Diversity, Inclusion and Global Consciousness[3]

Definition: Equity, diversity, inclusion and global consciousness is the ability to assess how the world and people's lives are shaped (such as by natural, social, cultural, economic, and political) and their implication for people's lives and earth's sustainability.

Outcome: Students will recognize and identify equity, diversity, inclusion and global consciousness as it applies to people and the world today.

Indicators	Benchmark (1)	Milestone (2)	Milestone (3)	Capstone (4)
Self-awareness	Demonstrates minimal awareness of own cultural rules, biases, and values as related to natural or human systems4.	Identifies own cultural rules, biases, and values as related to natural or human systems.	Explores new perspectives about own cultural rules, biases, and values as related to natural or human systems.	Articulates insights into own cultural rules, biases, and values as related to natural or human systems.
Cultural Diversity	Demonstrates minimal knowledge of another culture as related to natural or human systems.	Describes the complex elements of another culture as related to natural or human systems.	Explains the complex elements of other cultures as related to natural or human systems.	Articulates diverse perspectives on complex elements of multiple cultures as related to natural or human systems.
Equity and Equality	Demonstrates minimal familiarity of the differences between equality and equity.	Describes new perspectives when exploring equity and equality affecting systemically non-dominant identities.5	Analyzes different perspectives on issues of equality and equity affecting systemically non-dominant identities.	Applies diverse perspectives of equality and equity to complex subjects (social, cultural, natural, or political).
Global Consciousness	Demonstrates a minimal awareness of the issues associated with global concerns regarding how natural and/or human systems are interrelated.	Recognizes the issues associated with global concerns regarding how natural and/or human systems are interrelated.	Explains the issues associated with global concerns regarding how natural and/or human systems are interrelated.	Articulates the complexities associated with global concerns regarding how natural and/or human systems are interrelated.
Inclusion[6]	Demonstrates a minimal awareness of the need for safe, accessible, collaborative, supportive, respectful and equitable environments that increase participation and the contribution of everyone.	Recognizes the need for safe, accessible, collaborative, supportive, respectful and equitable environments that increase participation and the contribution of everyone.	Analyze one or more strategies to create safe, accessible, collaborative, supportive, respectful and equitable environments that increase participation and recognize the strengths of everyone.	Initiates and develops strategies to create safe, accessible, collaborative, supportive, respectful and equitable environments that increase participation and recognize the strengths of everyone.

3 *This rubric was created using the Association of American Colleges and Universities (AAC&U) Critical Thinking VALUE Rubric. Retrieved from* https://www.aacu.org/value-rubrics

4 A complex set of dynamic systems makes up our world. People depend on natural systems for survival. Natural systems influence people's activities. Human activities have an impact on natural systems and each region globally has a unique combination of natural and human systems.

5 Suggested terminology to use in lieu of historically disenfranchised, historically underrepresented, etc. as these are more exclusionary as well as non-dominant groups aren't necessarily a minority in number.

6 Inclusion is a collaborative, supportive and respectful environment that increases participation and the contribution of everyone. True inclusion removes all barriers, discrimination and intolerance. (adapted from https://ideal.com/diversity-and-inclusion/)

Information Literacy[7]

Definition: Information literacy is 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.

Outcome: Students will identify an information need and to locate, evaluate, and use information effectively and ethically.

Indicators	Benchmark (1)	Milestone (2)	Milestone (3)	Capstone (4)
Problem Statement (or Information Need) and Scope	Formulates a general topic (or information need). The scope is broad and not clearly defined. Identifies some key concepts, with some ambiguities.	Formulates a topic (or information need). The scope has been narrowed, though not clearly defined. Identifies key concepts, with less ambiguities.	Formulates a problem (or information need). The scope is appropriate and defined. Identifies key concepts and begins to identify its place within a knowledge base.	Formulates a problem (or information need). The scope is effective and well defined. Comprehends how the problem or information need connects and builds to a knowledge base.
Search Strategies and Information Systems	Finds little relevant information. Uses only 1 or 2 information systems and/or source types. Limited flexibility or reflection on search strategy. Uses basic keywords. Seeks out only confirming point of view and/or bias within information systems. Little to no recognition of information systems.	Finds some relevant information. Uses 1 to 3 information systems and/or source types. Practices some flexibility or reflection on keywords and search strategy. Favors confirming point of view and/or bias, but also seeks out objective sources and/or conflicting viewpoints. Recognizes information systems.	Finds mostly relevant information. Uses 2 to 3 information systems and 3 to 5 source types. Intentionally revises search strategies and gathers effective keywords. Seeks out objective sources and other voices/viewpoints. Begins to assess information systems.	Finds all relevant information using a variety of information systems in a wide range of source types. Critically and iteratively designs search strategies. Effectively expands keywords. Seeks out authoritative/expert sources, including conflicting or underrepresented/marginalized viewpoints. Accurately assesses information systems.
Categorizing and Evaluating Information	Chooses sources using simple criteria (relevance to problem or information need). Places equal value to sources found. Identifies few source types correctly. Sometimes identifies fact and opinion within an information source.	Chooses sources using some criteria (such as relevance and currency). Recognizes some traditional markers of authority. Identifies broad categories of source types. Identifies fact and opinion within an information source.	Chooses sources using multiple criteria (such as relevance, currency, and authority/expertise). Correctly identifies most source types. Identifies fact, opinion, objective, and subjective information.	Chooses a variety of sources using multiple criteria (such as relevance, currency, and authority). Assesses the value and utility of different source types. Classifies information into fact, opinion, objective, and subjective information.
Ethical and Legal Use of Information	Recalls basic definition of plagiarism, common knowledge, attribution (paraphrasing, quotation, summarizing, and references). Inconsistent use of citation style rules and conventions. Identifies basic legal issues on the use of creative content.	Recalls developing definition of plagiarism, common knowledge, attribution (paraphrasing, quotation, summarizing, and references). Fairly consistent use of citation style rules and conventions. Identifies some of the legal issues on the use of creative content.	Defines plagiarism, common knowledge, attribution (paraphrasing, quotation, summarizing, and references). Consistent use of citation style rules and conventions. Identifies legal issues on the use of any creative content. Knows to ask for help.	Demonstrates an understanding of what constitutes plagiarism, common knowledge, attribution (paraphrasing, quotation, summarizing, and references). Consistent use of citation style rules and conventions. Identifies legal issues on the use of any creative content. Knows how and when to consult additional help from experts.

This rubric is an adaptation of the Association of American Colleges & Universities (AAC&U) VALUE rubric on information literacy available at http://www.aacu.org/value-rubrics.

Quantitative Literacy and Reasoning[8]

Definition: Quantitative literacy is a competence in understanding and interpreting mathematical information necessary to fill one's role in a career and in society. It involves numeracy, measurement, inquiry, and the interpretation of results as well as an assessment of their reasonableness. Quantitative Reasoning is a process of analyzing quantities or mathematical models to deduce a conclusion. It involves understanding and applying mathematical concepts, computation, critical thinking, and can require familiarity with appropriate technology.

Outcome: Students will reason through and solve quantitative problems by collecting and interpreting data, and applying mathematical/statistical techniques.

Indicators	Benchmark (1)	Milestone (2)	Milestone (3)	Capstone (4)
Interpretation	Attempts to explain information presented in mathematical forms but draws incorrect or incomplete conclusions about what the information means.	Provides somewhat accurate explanations of information presented in mathematical forms, but occasionally makes minor errors.	Provides accurate explanations of information presented in mathematical forms.	Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information.
Representation	Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate.	Completes conversion of information but resulting mathematical portrayal is only partially appropriate or accurate.	Competently converts relevant information into an appropriate and desired mathematical portrayal.	Accurately converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.
Calculations	Calculations are attempted but learner needs assistance/supervision to achieve successful and comprehensive solutions.	Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented clearly and concisely.
Application Analysis Assumptions	Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work.	Uses the quantitative analysis of data as the basis for workmanlike (without inspiration or nuance, ordinary) judgments, drawing plausible conclusions from this work.	Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.

8*This rubric was created using the Association of American Colleges and Universities (AAC&U) Critical Thinking VALUE Rubric. Retrieved from* https://www.aacu.org/value-rubrics