Final Recommendation on Revised Liberal Learning Outcomes
Liberal Learning Council
May 10, 2022

Background

On April 21th, 2021, Steering charged the Liberal Learning Council (LLC) "to recommend an update of the Learning Outcomes for the Liberal Learning Program to implement the recommendations made by the Liberal Learning self-study, and the External report." (Entire charge can be found in Appendix A).

In sum, Steering charged the LLC to address the following:

- Reduce the current list to a small list of essential outcomes.
- Ensure that the outcomes are student learning outcomes.
- Ensure that every outcome in an area is readily measurable across all the courses students would take to meet that outcome.
- Ensure that every outcome includes an appropriate level of demonstrated proficiency.

Please note that Steering did **not** charge the LLC with adding, removing, or altering the Liberal Learning requirements, so the revised outcomes being recommended by the LLC are consistent with the current Liberal Learning requirements.

Process

During early Fall 2021, Associate Provost Kit Murphy, and Assistant Director of Assessment LaMont Rouse, developed a draft of revised outcomes, reducing the current set of well over 50 outcomes to 15 while addressing the other recommendations of the Liberal Learning Self Study and External review (see above). In drafting some of the outcomes, the Associate Provost and the Assistant Director of Assessment consulted the AAC&U Value Rubrics and reached out to a few campus constituencies with expertise in the area represented by the outcome (e.g., CEL Institute, Information Literacy Librarian, the chair of World Languages and Cultures, and the chair of Philosophy, Religion, and Classical Studies). The revised outcome for Natural Science was originally drafted by the School of Science.

The Liberal Learning Council reviewed and revised the draft outcomes and sought input on these draft outcomes from the Committee on Academic Programs (CAP), Academic Leaders, and

Records and Registration. The LLC then made additional revisions based on this input to produce its preliminary recommendation on March 30, 2022.

The LLC solicited Tier II testimony on its preliminary recommendation. A Qualtrics survey (Appendix B) was sent to faculty on March 31, 2022. The survey remained open through April 13, 2022, and a total of 43 faculty responded. Testimony was also solicited from the Faculty and Staff Senates and Student Government through emails sent to the presidents of these three groups on March 31, 2022, with reminder emails sent on April 24, 2022. No responses were received from any of these groups by May 4, 2022.

In general, survey respondents were supportive of the revised outcomes. Depending on the outcome, 79% – 93% of respondents indicated support for the revised outcome as is or with minor changes (average across outcomes = 88%). Over half (56%)of respondents indicated that the revised outcomes are much better than the current set, and one-fourth (26%) indicated that the revised outcomes were somewhat better than the current set.

Specific comments from the faculty survey led to in-depth discussion by the LLC of the outcomes and revision of their wording, as well as the development and inclusion of an additional recommendation (# 3). Issues raised about the wording of the outcomes for Gender and Race & Ethnicity prompted the LLC to seek additional input from the two departments with extensive expertise in these areas (Women's, Gender, and Sexuality Studies; African American Studies). The LLC also sought additional input from John Oliver, Information Literacy Librarian, on the Information Literacy outcome and Brittany Adyolette, Director of the Community Engaged Learning Institute, on the Community Engagement outcome. A summary of the testimony received, as well as how the LLC incorporated this testimony into the final recommendation can be found in Appendix C.

Assistant Director of Assessment, LaMont Rouse attended several of the LLC meetings in which the various iterations of the outcomes were discussed, including the last meeting at which the final version of the revised outcomes was approved, and he provided his expertise and input at each of these meetings.

Recommendations

The nomenclature used for the structural elements, domains, and requirements of Liberal Learning reflects the updated language recently approved by Steering that will go into effect Fall 2023.

For comparison, the current learning outcomes for the Liberal Learning Program are available in Appendix D.

Recommendation 1: Replace the current set of well over 50 outcomes for the Liberal Learning Program with the following 15 outcomes:

Upon degree completion, students will demonstrate the ability to:

Intellectual and Scholarly Growth

Information Literacy
Locate, evaluate, and use information responsibly to engage in advanced study and work.

Critical Thinking
Integrate in-depth knowledge to interrogate issues, ideas, artifacts, or events; develop conclusions; design solutions; or ask new questions.

Written Communication
Write effectively for specific audiences and purposes.

Oral Communication
Design and deliver effective presentations for specific audiences and purposes.

Second Language[1]
Communicate in a second language in a coherent, intelligible manner in social situations.

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[1] Because of constraints imposed by the number of accreditation or licensure requirements, only about half of all students are required to complete the language requirement.

Social Justice

Community Engagement
　　Engage with communities through purposeful study, action, and reflection.

Gender
　　Explain the social construction of gender and sexuality, and critically evaluate norms and practices of identity formation at interpersonal or wider levels.

Global Awareness
　　Identify and explain norms, values, and practices across different societies or regions to critically evaluate worldviews.

Race & Ethnicity
　　Evaluate critically how the social constructs of race and ethnicity lead to inequitable impacts on individuals, communities, or societies.

Multidisciplinary Perspectives

Literary, Visual, and Performing Arts
　　Analyze how creative texts, artworks, or performances reflect, shape, exalt, or challenge the values of a culture.

Belief Systems
　　Evaluate critically theories of reality, knowledge, or culture arising from areas of human inquiry.

Historical Perspectives
　　Analyze how forces, factors, and actors contribute to historical change.

Behavioral, Social, or Cultural Perspectives
　　Evaluate critically how human thought, emotion, and behavior affect and are affected by relationships or institutions at the level of the individual, culture, or society.

Natural Sciences
　　Use scientific data and approaches to inform a decision, solve a problem, or answer a question.

Quantitative Reasoning
　　Apply formal logic or numerical analysis to evaluate a quantitative claim, guide a decision, solve a problem, or answer a question.

Recommendation 2: The syllabus of any course with one or more Liberal Learning designations is required to include the learning outcome for those designations.

Rationale
Including the Liberal Learning outcome on the syllabus makes it clear to students that they will learn the knowledge and skills embodied by the requirement and will emphasize the role of the course in the Liberal Learning Program. The requirement should be put into place for any course with a Liberal designation, regardless of whether that designation was acquired through approval by the Liberal Learning Council (or its predecessors) or by virtue of the course prefix (see the [Approved Courses for Liberal Learning](#) webpage for these prefixes).

Recommendation 3: Change the title of the current requirement "Gender" to "Gender and Sexuality".

Rationale
In the input and testimony associated with the previous charge from Steering addressing the titles of the three structural elements and the various requirements of Liberal Learning, no one suggested any change to the title for the Gender requirement. In contrast, two respondents from the faculty survey for the current charge suggested changing the title to "Gender and Sexuality" The LLC found merit in this suggestion as the outcome for this requirement includes both terms, and therefore the LLC recommends this change in title.

Recommendation 4: Design an assessment plan for the revised outcomes immediately upon approval of the revised outcomes.

Rationale
Assessment of the outcomes of the Liberal Learning Program has been largely on hold following the Program's self-study and external review as the College discussed, without resolution, first the goals and then the structure of the program. Now that the outcomes have been reduced to a manageable number and rephrased to be measurable, the College can systematically assess student mastery of the outcomes while the College refines its strategic vision and thereby seeks answers to questions that will set the direction for the Liberal Learning Program. In the meantime, strategic assessment of the Program can provide the information needed for both program improvement and accountability in the upcoming Middle States review.

The Associate Provost for Curriculum and Liberal Learning and the Assistant Director of Assessment should collaborate on the creation of a multi-year plan for assessment of the newly revised outcomes.

Appendix A
Steering Charge to Liberal Learning Council

MEMORANDUM
TO: LLC
CC: CAP
FROM: Steering Committee
RE: Liberal Learning Outcomes
DATE: April 21th, 2021

Background
There have been several studies of the The College of New Jersey's Liberal Learning Program in recent years. The Liberal Learning Program's 2015 Self-Study report recommended that
> The College should revisit what it considers as its essential outcomes and … reduce the overall number of individual outcomes to focus on essential outcomes that are central to preparing students and to our identity as a college. (p. 27)

The report of the 2016 External Review Committee for the Liberal Learning Program agreed with the findings of the self-study. Its strongest recommendation for the Liberal Learning program was to:
> - "Reduce the total number of LLP outcomes
> - Ensure that the outcomes you keep are actually student learning outcomes
> - Ensure that every outcome in an area is readily measurable across all the courses or experiences students may use to acquire and demonstrate it
> - Ensure that every outcome includes an appropriate level of demonstrated proficiency." (p. 5)

The External Review report also noted:
> "Finally, the LLP outcomes do not seem to relate to any overarching institutional learning outcomes, the knowledge, skills, and dispositions that every TCNJ should possess by the time of graduation, i.e. making sense of and integrating the entire student experience." (p.3)

The Liberal Learning Task Force met from 2018-2020 and issued its final report to the Steering committee in May 2020. It recommended that TCNJ
> "Adopt a short set of clearly articulated, broad learning goals for a TCNJ education." (p.4) (see Appendix I at the end of this charge for the Task Force's suggested list of goals).

and that

> "these broad learning goals should form the basis for the development of more specific learning
> goals for Liberal Learning by the Liberal Learning Council … thereby addressing the recommendation from the self-study and program review to revise the Liberal Learning outcomes." (p.4)

At present, in Spring 2021, TCNJ has begun a strategic review that is anticipated to continue through the Fall 2021 semester. Upon its completion, the College may decide to review the set of degree level learning goals, but it is expected that the core learning outcomes for Liberal Learning would not significantly change. In the meantime, it is possible to make progress on revising the list of Liberal Learning outcomes pursuant to the recommendations of the 2015 Self-Study and the 2016 External Review report.

Charge

Steering charges the Liberal Learning Council to recommend an update of the Learning Outcomes for the Liberal Learning Program to implement the recommendations made by the Liberal Learning self-study, and the External report. Namely, LLC should
- Revise the list of learning outcomes of the Liberal Learning program. The list of learning outcomes should be reduced to a small list of essential outcomes. (Because some of the degree level goals suggested by the Liberal Learning Task Force relate to general education, the Task Force's list of suggested degree level goals may be helpful.)
- Ensure that the final outcomes are student learning outcomes.
- Ensure that every outcome in an area is readily measurable across all the courses, no matter what mode of instruction, or experiences students may use to acquire and demonstrate it.
- Ensure that every outcome includes an appropriate level of demonstrated proficiency.

In keeping with the timeline below, Steering requests that LLC consult with the Committee on Academic Programs, the Council of Deans, Academic Leaders, Assistant Director of Assessment LaMont Rouse, and Records and Registration. Once the LLC has completed this work, it should prepare a preliminary recommendation and seek broad testimony from across the campus community, including, but not limited to: Student Government, Faculty Senate, and Staff Senate.

Timeline

LLC should begin work on the charge immediately. LLC should prepare a preliminary recommendation by January 18th, 2022. LLC should solicit campus testimony soon after with the goal of making a final recommendation to Steering no later than March 9th, 2022.

Testimony Tier: Tier II

This issue concerns the distillation of recommendations of previous studies of the Liberal Learning Program. It requires moderate additional testimony from the campus community. The assigned council or committee should consult with relevant individuals and groups in developing a preliminary recommendation. The completed preliminary recommendation should then be made available to the relevant stakeholder groups, and testimony should be solicited in the form of written feedback (through a survey and or e-mail).

Appendix B: Faculty Survey on LLC Preliminary Recommendation

Steering has charged the Liberal Learning Council (LLC) "to recommend an update of the Learning Outcomes for the Liberal Learning Program to implement the recommendations made by the Liberal Learning self-study, and the External report."

The LLC is seeking input from faculty on its preliminary recommendation for the revised learning outcomes. Although we welcome all feedback on the draft outcomes, we would especially value your input on those aspects that Steering charged the LLC to address:

- Reduce the current list to a small list of essential outcomes
- Ensure that the outcomes are student learning outcomes.
- Ensure that every outcome in an area is readily measurable across all the courses students would take to meet that outcome.
- Ensure that every outcome includes an appropriate level of demonstrated proficiency.

Please note that Steering did not charge the LLC with adding, removing, or altering the Liberal Learning requirements, so the LLC has constructed the revised outcomes to be consistent with the current Liberal Learning requirements.

The LLC has reduced the current set of over 50 outcomes to 15. The survey will first ask you to provide feedback on each of the 15 outcomes and then will ask you about the set as a whole and allow you to add any additional thoughts you may have about the outcomes.

The nomenclature used in this survey for the structural elements, domains, and requirements reflects the updated language recently approved by Steering, which goes into effect Fall 2023.

You may download the charge from Steering: Steering Charge to LLC 2021-4-21 about learning outcomes.pdf.
You may also review the LLC Preliminary Recommendation on Revised Liberal Learning Outcomes.pdf.

You may access the current Liberal Learning Program learning outcomes at the following three pages of the Liberal Learning website:
https://liberallearning.tcnj.edu/learning-outcomes-isg/
https://liberallearning.tcnj.edu/what-you-learn-2/civic-responsibilities/
https://liberallearning.tcnj.edu/learning-outcomes-broad-areas-of-human-inquiry/

You will be able to complete the survey until **11:59 pm on Wednesday, April 13**.

Thank you in advance for completing this survey and for your thoughtful feedback on these outcomes,

The Liberal Learning Council

Intellectual and Scholarly Growth
Upon degree completion, students will demonstrate the ability to:

Information Literacy
> Locate, evaluate, and use information responsibly to engage in advanced study and work.

- ○ I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- ○ I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- ○ I support this revised outcome, but only if some major changes are made (please provide these below).
- ○ I do not support this revised outcome (please explain why below).

Information Literacy: Explanations, suggestions, or any additional feedback you would like to provide.

Critical Thinking
> Integrate in-depth knowledge to interrogate issues, ideas, artifacts, or events; develop conclusions, design solutions, or ask new questions.

- ○ I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- ○ I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- ○ I support this revised outcome, but only if some major changes are made (please provide these below).
- ○ I do not support this revised outcome (please explain why below).

Critical Thinking: Explanations, suggestions, or any additional feedback you would like to provide.

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Written Communication

Effectively communicate through writing to a variety of audiences for a range of Purposes.
- ○ I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- ○ I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- ○ I support this revised outcome, but only if some major changes are made (please provide these below).
- ○ I do not support this revised outcome (please explain why below).

Written Communication: Explanations, suggestions, or any additional feedback you would like to provide.

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Oral Communication

Design and deliver purposeful presentations to effectively communicate to a variety of audiences for a range of purposes.
- ○ I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- ○ I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- ○ I support this revised outcome, but only if some major changes are made (please provide these below).
- ○ I do not support this revised outcome (please explain why below).

Oral Communication: Explanations, suggestions, or any additional feedback you would like to provide.

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Second Language
Communicate in a second language in a coherent, intelligible manner in social situations.*

*Because of constraints imposed by the number of accreditation or licensure requirements, not all students are required to complete the language requirement.

- ○ I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- ○ I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- ○ I support this revised outcome, but only if some major changes are made (please provide these below).
- ○ I do not support this revised outcome (please explain why below).

Second Language: Explanations, suggestions, or any additional feedback you would like to provide.

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Social Justice
Upon degree completion, students will demonstrate the ability to:

Community Engagement
Engage with communities through purposeful, reflective and collaborative activities.
- ○ I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- ○ I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- ○ I support this revised outcome, but only if some major changes are made (please provide these below).
- ○ I do not support this revised outcome (please explain why below).

Community Engagement: Explanations, suggestions, or any additional feedback you would like to provide.

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Gender

Identify and explain the social constructs surrounding gender and sexuality to critically evaluate inequitable norms and practices.

- ○ I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- ○ I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- ○ I support this revised outcome, but only if some major changes are made (please provide these below).
- ○ I do not support this revised outcome (please explain why below).

Gender: Explanations, suggestions, or any additional feedback you would like to provide.

Global Awareness

Identify and explain norms, values, and practices across different societies or regions to critically evaluate worldviews.

- ○ I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- ○ I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- ○ I support this revised outcome, but only if some major changes are made (please provide these below).
- ○ I do not support this revised outcome (please explain why below).

Global Awareness: Explanations, suggestions, or any additional feedback you would like to provide.

Race & Ethnicity

Evaluate critically how the social constructs of race and ethnicity lead to inequitable impacts on individuals, communities, and societies.

- ○ I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- ○ I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- ○ I support this revised outcome, but only if some major changes are made (please provide these below).
- ○ I do not support this revised outcome (please explain why below).

Race & Ethnicity: Explanations, suggestions, or any additional feedback you would like to provide.

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Multidisciplinary Perspectives

Upon degree completion, students will demonstrate the ability to:

Literary, Visual, and Performing Arts

Analyze how creative texts, artworks, or performances reflect, shape, exalt, or challenge the values of a culture.

- ○ I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- ○ I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- ○ I support this revised outcome, but only if some major changes are made (please provide these below).
- ○ I do not support this revised outcome (please explain why below).
- ○

Literary, Visual, and Performing Arts: Explanations, suggestions, or any additional feedback you would like to provide.

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Belief Systems

      Evaluate critically theories of reality, knowledge, or culture arising from areas of human inquiry.

- I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- I support this revised outcome, but only if some major changes are made (please provide these below).
- I do not support this revised outcome (please explain why below).

Belief Systems: Explanations, suggestions, or any additional feedback you would like to provide.

Historical Perspectives

      Analyze how forces, factors, and actors contribute to historical change.

- I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- I support this revised outcome, but only if some major changes are made (please provide these below).
- I do not support this revised outcome (please explain why below).

Historical Perspectives: Explanations, suggestions, or any additional feedback you would like to provide.

Behavioral, Social, or Cultural Perspectives

Evaluate critically how human thought and behavior affect relationships or institutions at the level of the individual, culture, or society.

- ○ I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- ○ I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- ○ I support this revised outcome, but only if some major changes are made (please provide these below).
- ○ I do not support this revised outcome (please explain why below).

Behavioral, Social, or Cultural Perspectives: Explanations, suggestions, or any additional feedback you would like to provide.

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Natural Sciences

Use scientific data and approaches to inform a decision, solve a problem, or answer a question.

- ○ I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- ○ I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- ○ I support this revised outcome, but only if some major changes are made (please provide these below).
- ○ I do not support this revised outcome (please explain why below).

Natural Sciences: Explanations, suggestions, or any additional feedback you would like to provide.

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Quantitative Reasoning

Apply logical or numerical analysis to evaluate a quantitative claim, guide a decision, solve a problem, or answer a question.

- I support this revised outcome, and it is fine as written (please explain below why you support the revised outcome)
- I support this revised outcome, but I have some minor suggestions for improvement (please provide these below)
- I support this revised outcome, but only if some major changes are made (please provide these below).
- I do not support this revised outcome (please explain why below).

Quantitative Reasoning: Explanations, suggestions, or any additional feedback you would like to provide.

Overall Comments

Overall, how do the draft revised outcomes compare to the current set of outcomes?
- The revised outcomes are much better than the current set.
- The revised outcomes are somewhat better than the current set.
- The revised outcomes are neither better nor worse than the current set.
- The revised outcomes are somewhat worse than the current set.
- The revised outcomes are much worse than the current set.

Please explain the reasoning behind your choice for the previous question.

Please provide any additional feedback on the draft revised Liberal Learning outcomes.

Appendix C: Summary of Testimony and Its Incorporation into the Final Recommendation

This appendix summarizes the Tier II testimony received by the LLC through the survey of faculty that was sent to faculty on March 31, 2022 and remained open through April 13, 2022, and additional input the LLC sought from the chair of Women's, Gender, and Sexuality Studies, the chair of African American Studies, John Oliver, Information Literacy Librarian, and Brittany Adyolette, Director of the Community Engaged Learning Institute. The LLC also received email input from Computer Science.

Testimony received is summarized below by learning outcome in the preliminary recommendation. For each outcome, we report the percentage of faculty respondents who supported the outcome as is or with minor changes and then provide a summary of the comments from the survey that the LLC found relevant and insightful, as well as any input from those consulted by the LLC or provided via email. Feedback is followed by a description of how the LLC incorporated that feedback.

In general, the LLC attempted to ensure that the revised outcomes were more general, rather than restrictive to specific contexts or situations that might not be easily addressed by current courses. A repeated comment on the Oxford comma was incorporated throughout.

Learning Outcomes

Upon degree completion, students will demonstrate the ability to:

Intellectual and Scholarly Growth

Information Literacy
>Locate, evaluate, and use information responsibly to engage in advanced study and work.
>
>91% support outcome as is or with minor changes
>
>Relevant comments to consider
>- Replace advanced for academic
>- Add the word successfully (or is that overkill)????
>- I would cut everything after "to". The wording tripped me up and I think it's implied by our mission as a college. Further, there are other uses of information we care about, e.g., citizenship and social justice. So: "Locate, evaluate, and use information responsibly."

Additional Input
John Oliver, Information Literacy Librarian, supports this outcome as written.

Incorporation of feedback by LLC
The LLC made no changes to the outcome from the preliminary recommendation, given Mr. Oliver's endorsement.

Critical Thinking

Integrate in-depth knowledge to interrogate issues, ideas, artifacts, or events; develop conclusions, design solutions, or ask new questions.

93% support outcome as is or with minor changes

Relevant comments to consider
- exclude word interrogate from outcome
- AND ask new questions
- "in-depth" is overkill, and "interrogate" has a negative connotation; this seems like 5 things packed into 1 and will lead to difficulty knowing which and how much courses are meeting the objective, since some courses could be big on a subset and ignore the rest
- Maybe examine instead of interrogate???

Incorporation of feedback by LLC
The LLC retained "interrogate" because it is stronger than "examine" and did not change "or" to "and" because it would be unreasonable to require all courses to address all of the contexts listed. The use of "or" addresses the comment on "5 things packed into 1."

Written Communication

Effectively communicate through writing to a variety of audiences for a range of purposes.

89% support outcome as is or with minor changes

Relevant comments to consider
- too broad; specify range of purposes
- More specificity regarding the targeted audiences. Perhaps within, and or to a group with less material content,
- then the student's current program of study?
- "communicate through writing to" is clunky and seems redundant with "effectively write", as in "Effectively write to [or "for"] a variety..."
- shouldn't "standard written English" be mentioned, or is that implied by "effectively"?

- Except for FSP, written communication is fulfilled through the major. In the major, students are taught to write to the audience as deemed appropriate by the department. in most departments, that would be to a scholarly audience. So the writing goal does not make sense. Departments do not teach students to write about their discipline in multiple audiences, but to a scholarly audience. We don't have students write a blog post, popular press book, etc. The goal is different from what departments are doing, and would vastly change what is being doen in the department.
- . . .to connect with a variety of audiences. . . .
- too vague

Incorporation of feedback by LLC
The LLC revised the outcome to incorporate most of these suggestions.

Oral Communication

Design and deliver purposeful presentations to effectively communicate to a variety of audiences for a range of purposes.

83% support outcome as is or with minor changes

Relevant comments to consider
- I think that other forms of oral communication beyond presentation should be included here (for instance, leading a discussion, conducting an interview, etc.)
- too broad; specify range of purposes
- to communicate effectively--split infinitives are a thing for me....
- Perhaps broaden how you define oral communication - is this limited to spoken presentations? does it include singing? how about video?
- More specificity regarding the targeted audiences. Perhaps within, and or to a group with less material content, then the student's current program of study?
- "purposeful" seems extraneous, and same as Written, "Design and deliver presentations to communicate to a variety..." is simpler and better. When it comes time to define what this looks like, then what makes the presentation effective can be defined.
- See response to written communication.
- add confidently and (before effectively)
- too vague

Incorporation of feedback by LLC
The LLC revised the outcome to incorporate most of these suggestions.

Second Language
    Communicate in a second language in a coherent, intelligible manner in social situations.

    88% support outcome as is or with minor changes

    Relevant comments to consider
    - "social situations" is confusing; immersive environment?
    - I think it should specify study of _foundations_ to a second language, so that ... (the desired outcomes might be met).
    - Again, the adjectives "coherent, intelligible" are extraneous.
    - When would a second language be used that was not in a "social situation"?
    - Students should be able to read a second language

    Incorporation of feedback by LLC
    The LLC retained the outcome from the preliminary recommendation because its phrasing aligns with the level of proficiency set out by ACTFL (American Council on the Teaching of Foreign Languages), the association for World Language professionals, and the current TCNJ language requirement.

Social Justice

Community Engagement
    Engage with communities through purposeful, reflective and collaborative activities.

    91% support outcome as is or with minor changes

    Relevant comments to consider
    - Reflection is important.
    - Oxford comma usage? Is the possible missing comma consistent with other formal writing for TCNJ?
    - Please use Oxford commas throughout!
    - what about critical analysis of justice theories or activism? why is it only community engagement?
    - Quite vague. The explanation of the outcome does not match common understanding of social Justice.

    Additional Input
    The Staff from the Community Engaged Learning Institute suggested:
        "Engage with communities through purposeful education, action, and reflection."

Incorporation of feedback by LLC
The LLC adopted the suggestion by the CEL Institute but changed "education" to study to make it clear that it is students and not the community that will be educated as a result of the outcome.

Gender

Identify and explain the social constructs surrounding gender and sexuality to critically evaluate inequitable norms and practices.

79% support outcome as is or with minor changes

Relevant comments to consider
- The heading should be "Gender and Sexuality." And: "to evaluate critically norms and practices." Not all norms and practices are inequitable, and the "critically" intimates that they are constructs and therefore may be inequitable.
- If we are addressing the current definition of gender so bit it, but be more specific. Gender is very time and society specific, and in itself, is a VERY fluid term.
- social "variables"??? instead of constructs
- I'd strongly suggest label this as "Gender and Sexuality."
- 1) Why is gender in the title and not sexuality? "Social constructs" surrounding gender is verbose and less clear than the "social construction of gender" or "how gender is socially constructed." Gender and sexuality are not reducible to sexism. People also celebrate and enjoy their gender and sexual identities. Why have we not included cis/trans/nonbinary identities? Why exclude sex?
- shouldn't it be "critically evaluate norms and practices"?
- I think the wording here is problematic, assuming that there are inequities that need to be evaluated, when a reasonable person could think differently. It might work to say "critically evaluate current norms and practices."

Additional Input
From the chair of WGSS:

'The WGSS faculty came up with two similar rewordings of the proposed Liberal Learning outcome for the Gender requirement:

"Explain the social construction of gender and sexuality through feminist lenses, and critically evaluate norms and practices through individual, institutional, national, or transnational perspectives."

"Explain the social construction of gender and sexuality through feminist lenses, and critically evaluate norms and practices of identity formation at interpersonal, institutional, national, or transnational levels."

'I prefer the second wording. The goal is to reduce some of the vagueness of the proposed wording while also sketching some of the scope of critical thinking about gender and sexuality.'

Incorporation of feedback by LLC
The LLC adopted a revised version of the second suggested phrasing from WGSS. The prepositional phrase "through feminist lenses" was removed to accommodate other perspectives, and "institutional, national, or transnational levels" was replaced with "wider levels," to simplify the outcome and allow for other wider levels (e.g., societal) without restricting the outcome to interpersonal as might happen if the outcome were simply ended at "identity formation."

The LLC added a recommendation to its final recommendations to change the title of the Gender requirement to "Gender & Sexuality."

Global Awareness
Identify and explain norms, values, and practices across different societies or regions to critically evaluate worldviews.

82% support outcome as is or with minor changes

Relevant comments to consider
- add and engage with others as a global citizen
- to critically comprehend and evaluate worldviews
- To evaluate critically.... This one is better than Gender, because it does not load the outcome with "inequitable." In any case, the Gender and Global outcomes here could be more similar.
- This learning outcome was appropriate in the previous iteration when this was called civic responsibility. The current outcome has nothing to do with social justice. It would be as if the race and ethnicity learning goal said that the goal was to explain how there are differences across different races and ethnicities, without critically evaluating how the social constructs lead to inequity. Similarly, Global Awareness shouldn't be just about the fact that differences exist, but that these differences exist within a context of inequity and injustice. That's what makes TCNJ's Social Justice learning goals social justice. Otherwise, why call it social justice if the learning goal has nothing to do with social justice.

- See previous comment on Oxford comma -- there is one here but not in the previous statement; is the word cultures needed?
- Is critiquing the only thing we want students to do with worldviews? Why not also understand? I'd also be happy with just cutting everything from "to" on.
- "in order to critically evaluate worldviews"

Incorporation of feedback by LLC
The phrasing from the preliminary outcome was retained. It is true that the lack of inclusion of "inequity" in this outcome reduces the connection between the outcome and social justice, but it in no way precludes global courses with a strong social justice perspective, and it permits inclusion of courses focused on the development of cultural competence and reduction of bias against other cultures.

Race & Ethnicity
Evaluate critically how the social constructs of race and ethnicity lead to inequitable impacts on individuals, communities, and societies.

85% support outcome as is or with minor changes

Relevant comments to consider
- See my comment on Gender above (And: "to evaluate critically norms and practices." Not all norms and practices are inequitable, and the "critically" intimates that they are constructs and therefore may be inequitable).
- same comment -- Oxford comma?
- Basically the same comments for gender. Race and ethnicity are not only about oppression. Race and ethnicity are also a source of joy and pride. I think this needs a lot of work and I'd recommend working closely with all the faculty in HSS who are expert in these issues
- Evaluate critically how the social constructs of race and ethnicity lead to impacts on individuals, communities, and socities
- Give up identity politics. It is too divisive. Talk about ending discrimination and bias.
- "Examine and critically evaluate" (to make the phrasing more similar to the "identify & explain" used for Gender &
- Global)
- Same concern as with gender. It isn't fair to build in the social justice assumptions. Instead of "lead to inequitable impacts," why not just "impact."

- Do you need the word "critically," which is not in the other social awarenesses? Doesn't the rest of the sentence imply that the student is evaluating critically when it leads to an understanding of the "inequitable impacts"? This is a minor suggestion and not one I feel strongly.

Additional Input
From the chair of AAS
"This Race and Ethnicity learning outcome looks fine."

Incorporation of feedback by LLC
The phrasing from the preliminary recommendation was retained because of the endorsement by the chair of African American Studies.

Multidisciplinary Perspectives

Literary, Visual, and Performing Arts
Analyze how creative texts, artworks, or performances reflect, shape, exalt, or challenge the values of a culture.

90% support outcome as is or with minor changes

Relevant comments to consider
- too broad; specify range of purposes
- Analyze and/or manifest how creative
- visualizations and simulations (e.g. for data or scientific processes) should also be included since they can beartistic as well; 'exalt' is a strange word to be using here
- More free thinking would be better.
- Oxford comma? at the end, is it appropriate to say and/or as it could be more than one?
- What has changed???

Incorporation of feedback by LLC
There was very strong support for the revised outcome, so the phrasing from the preliminary recommendation was retained.

Belief Systems

Evaluate critically theories of reality, knowledge, or culture arising from areas of human inquiry.

88% support outcome as is or with minor changes

Relevant comments to consider
- Critically evaluate
- In today's climate, I am not certain what this topic actually covers. On most college campuses, the 'belief system' is that of one political view. As a fiercely independent thinker, I do not like that.
- Culture is vague here-- so would anthropology count? Linguistics?
- Oxford comma?
- What has changed???
- "Analyze and critically evaluate"
- I'm not sure I know what this one means or even what it's about.
- I previously questioned the need for "critically" and I think it is unnecessary here as well. It is implied.

Incorporation of feedback by LLC
There was very strong support for the revised outcome, so the phrasing from the preliminary recommendation was retained.

Historical Perspectives

Analyze how forces, factors, and actors contribute to historical change.

90% support outcome as is or with minor changes

Relevant comments to consider
- actors; define
- I feel like the word "context" should be in here, perhaps more so than "factors."
- Oxford comma? Should this be rewritten to include the words cause and effect? To be clear -- actions instead of actors?
- What has changed???
- This makes us look like a high school. Let it go.

Incorporation of feedback by LLC
There was very strong support for the revised outcome, so the phrasing from the preliminary recommendation was retained.

Behavioral, Social, or Cultural Perspectives

Evaluate critically how human thought and behavior affect relationships or institutions at the level of the individual, culture, or society.

90% support outcome as is or with minor changes

Relevant comments to consider
- change to critically evaluate or drop word critically
- AND society
- and/or should replace or in both places
- Humans don't have just thought and behavior, but thought, emotion, and behavior. Also, it's not that humans impacts individual, culture, or society, but that it is a reciprocal relationship of mutual impact. Also, it's not just "critical evlauation," but the making of that critical evaluation of empirical evidence gathered through scientific methods. The methodology is in some ways what sets this discipline apart, and disciplinary methodology has to be part of the goal.
- Oxford comma?
- What has changed???
- Analyze and critically evaluate
- I previously questioned the need for "critically" and I think it is unnecessary here as well. It is implied.

Incorporation of feedback by LLC
Emotion and the reciprocal nature of the effects were added to the outcome.

Natural Sciences

Use scientific data and approaches to inform a decision, solve a problem, or answer a question.

88% support outcome as is or with minor changes

Relevant comments to consider
- I am concerned that the new outcomes are weaker than the old ones, and do not cover some important areas. In particular, in addition to using scientific data, I believe students should learn to use appropriate resources to evaluate scientific claims.
- perhaps this should not be limited to "natural" sciences but all sciences that include data analysis and have formal processes / approaches
- Since a "scientific approach" includes using data generated through a scientific approach, the "data and" can be dropped. Overall this objective seems simplistic and narrow in its view on what a non-science-major should gain from a natural science course as part of 32 units at TCNJ. Among the Multidisciplinary Perspectives objectives (other than QR), the

Natural Sciences objective differs greatly from the others as the only one that doesn't evoke any concept of content knowledge. I strongly support the objective including using and applying scientific approach to, but as stated, that's *all* that is included in the obective. Scientific approaches aren't only used in natural science, and natural science is much more than an approach or a dataset or kind of data.
- This seems really limiting. So as long as the course uses scientific data to inform a decision, etc., it would meet the goal? So a sociology course that uses scientific methods and data would fulfill this goal?
- change the word "approaches" to "methods"
- Oxford comma? Use seems weak to me -- investigate? explore? research?
- What has changed???

Incorporation of feedback by LLC
The LLC appreciates that the outcome as phrased applies to disciplines outside the natural sciences that share the same epistemology (e.g., anthropology, psychology, sociology), but the LLC felt that the title of the requirement ("Natural Science") precludes inclusion of courses from such disciplines, and attempts to add "natural" or "natural sciences" rendered the outcome cumbersome.

Quantitative Reasoning
Apply logical or numerical analysis to evaluate a quantitative claim, guide a decision, solve a problem, or answer a question.

91% support outcome as is or with minor changes

Relevant comments to consider
- The new outcome does not include computation, which was included in the previous outcomes. I suggest replacing the word logical with computational to account for this.
- I appreciate the attempts to simplify these. However as I read this I think that any course on campus could meet
- this requirement, as hopefully all classes at some point expect questions to be addressed logically. Perhaps we could require either logical AND numerical analysis, or if we sish to be more inclusive of the formal logic course in philosophy perhaps "Apply FORMAL logic or numerical analysis...."
- remove 'numerical' or add 'computational'
- oxford comma?
- What has changed???
- Would only support for incoming students with a deficiency in this area.

Additional Input

The Department of Computer Science, via email, recommended the following change:

> "Apply **computational and/**or numerical analysis to evaluate a quantitative claim, guide a decision, solve a problem, or answer a question."

Incorporation of feedback by LLC

By changing "logical" to "formal logic," LLC members with expertise in disciplines most closely related to Quantitative Reasoning felt that the outcome encompasses computational analysis. The LLC fully supports the fulfillment of this requirement by courses that impart computational skills to students.

Overall, how do the draft revised outcomes compare to the current set of outcomes?

82% felt the revised outcomes are somewhat or much better than the current set.

Comments
Supportive
- Better clarifies specific goals
- The revised outcomes use concise language that set clear expectations for learning.
- They are much simpler, and still entail all of the previous outcomes, in a nutshell.
- Fifty outcomes is too many; I applaud your work in culling this to a more reasonable - and manageable -- fifteen.
- There are way too many bulleted points under current outcomes
- Previous outcomes were, in my opnion, overly and unneccesarily complex. It felt to me the a desire for comprehensiveness was overly zealous
- New LO's are clear, concise & straightfoward
- With minor exceptions they are all clear and important.
- The revised outcomes are clear, focused, and describe critical skills that educated individual should possess
- More concise

Critical
- These outcomes are not as comprehensive as the original ones, and would allow, in time, an erosion of the quality of our offerings.
- The outcomes are too simple and leave out too much
- The revised outcomes to me are the SAME as the current ones. As such nothing will change with regards to faculty or student perceptions.
- I think the Social Justice outcomes still need a fair amount of work

Other/Mixed
- depends on outcome
- I think the curtailing simplifies, but it also likely lowers our expectations? As I see my own reaction to the QRchange I wonder if I should be recognizing similar limitations with the other changes.
- 15 broader outcomes represent a more reasonable set to help students and faculty to conceptualize the goals of liberal learning. I do remain skeptical that "measurement" of most of these outcomes is feasible except in a broadbrush qualitative sense.
- I think the similarity in category names is a good thing, this will make advising easier, and I think the category names are pretty good. Most of the categories seem to capture the core of the area plus give room for breadth when thinking about how they show in actual courses, except for the Natural Sciences objective, which is overly narrow.
- Fewer is better but could be combined into 5 objectives.

Please provide any additional feedback on the draft revised Liberal Learning outcomes.
- If we are to have expectations of breadth in the curriculum, it is important that these are meaningful. If we can simplify language while maintaining expectations, then this will be beneficial.
- I appreciate the opportunity to suggest minor tweaking.
- I am fine with the revised outcomes. However, I like the first 5 bullet points under "Intellectual and Scholarly Growth" of the current outcomes. I these five bullet points explain well the broader goals of liberal learning and a liberal arts college. I think I would turn these into a mission statement, with the new, shortened outcomes being the actual outcomes.
- Nice work, but it's unclear to me how most of these outcomes can be assessed.
- Good job boiling it down to 15
- Because my discipline is within Behavior, Social or Cultural perspectives, I commented on that specifically. It's not that I supported the revisions for the other domains, but that I don't want to comment on what the learning goal for those domains should be.
- Thanks for your efforts to improve these!
- I enjoyed working on this survey. Thank you for allowing my input.
- Is much more concise, without sacrificing meaning and relevance.
  Get rid of this "sacred cow!" Go for fewer classes and one that are harder hitting.

Appendix D: Current Liberal Learning Outcomes

Intellectual & Scholarly Growth

Students will be able to demonstrate fundamental dispositions and abilities to engage in academic discourse, including analytic and integrative skills, and the ability to formulate, defend, and communicate their own points of view.

- Students are expected to learn how higher learning provides an intellectually exciting and challenging experience. Students should gain intellectual curiosity and be intellectually engaged with academic questions.
- Students should deal in significant ways with questions or points of view about areas of knowledge or controversies within areas of knowledge, rather than simply with the areas themselves.
- Students should engage in a free exchange of ideas involving both discussion and oral presentations. We expect the exchange to be constructive and civil.
- Students should engage in scholarship that is basically the same as that expected in upper level courses, but without required prerequisites. Students should engage in independent and group research.
- Students should think about charting a path through college that prepares them for life.

Students will be able to demonstrate well-developed, confident identities as good writers who can communicate clearly and effectively to an array of audiences for a range of purposes.

- Students should be able to appreciate the similarities & difference between oral and written communication; respond to needs of different audiences; respond to rhetorical situations; use appropriate strategies and conventions; focus on specific purpose; adopt voice, tone, and formality level suited to purpose and audience; and apply technology.
- Students will be able to use writing and reading for inquiry, learning, thinking, and communicating; understand assignments as a process that includes analyzing and synthesizing from sources; develop note-taking systems; integrate own ideas with others; and use appropriate technologies for inquiry.
- Students should be able to understand writing as an open, recursive process; develop techniques for brainstorming; be aware that it takes multiple drafts to complete a successful text; develop flexible strategies for revising, editing, and proof-reading; understand the collaborative aspects of writing process; learn to critique their own and others' work; learn to balance the advantages of relying on others with the responsibility of doing their own part; integrate technology.
- Students should learn common formats for different kinds of texts; practice appropriate means of documenting their work; and control surface features such as syntax, grammar, punctuation, and spelling, which affect meaning, purpose, and readers' comprehension.

Students will be able to demonstrate well-developed, confident identities as good speakers who can communicate clearly and effectively to an array of audiences for a range of purposes.

- Students should be able to recognize the need for speaking events and develop an appropriate response. They should be able to assess audience type and need and select a topic and form of address that is suited to their purpose.
- Students should be able to study a topic and organize insights and information according to effective rhetorical methods. They should clearly state their intent, organize the presentation, provide sufficient support, and select words and phrases that accurately represent ideas and feelings suited to the topic.
- Students should be skilled in effective delivery of more formal speeches. They should demonstrate verbal and nonverbal as well as social interaction skills that contribute to the effectiveness in conveying their intended message.

Students will become familiar with at least one additional language so they can readily access perspectives and information from communities other than their own.

- Students will be able to understand sentence-length utterances which consist of recombinations of learned elements in a limited number of content areas, particularly if strongly supported by the situational context.
- Students will be able to handle successfully a limited number of interactive, task-oriented, and social situations.
- Students will be able to understand main ideas and/or some facts from the simplest connected texts dealing with basic personal and social needs.
- Students will be able to meet limited practical writing needs.

Students will be able to navigate information resources using digital and other technology in order to support their studies, and their efforts to communicate their findings persuasively.

- The information literate student determines the nature and extent of the information needed.
- The information literate student accesses needed information effectively and efficiently.
- The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.
- The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.
- The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.

Civic Responsibilities

Race and ethnicity

Issues of race and ethnicity reside at the heart of America's national identity and underlie some of the nation's most persistent problems. The goal of this civic responsibility is to help students understand the nature of race and ethnicity and the impact both have on our lives in modern communities.

Learning Outcomes

Students should have an understanding of the nature of race and ethnicity and the impact both have on our lives in modern communities.

- Students should be able to explain the broad spectrum of human racial and ethnic experience. They should understand the differences and similarities between race and ethnicity as concepts.
- Students should understand the arbitrary and socially defined nature of race as well as analyze the ways race and racism maintain positions of class, power, and privilege in America.
- Students should develop thoughtful and equitable personal, ethical, and political decision-making abilities when considerations of race and ethnicity are involved. They should identify the limits of ethnocentric and parochial thinking.

Gender

The ideas and practices about gender and sexuality mold identities, institutions, nations, and global interactions. The goal of this civic responsibility is to explore how the construct of gender affects our society.

Learning Outcomes

Students should have an understanding of gender and the impact it has on our lives in modern communities.

- Students should be able to explain how gender and sexuality shape our daily lives. They should understand how gender is a central category of analysis that informs our interpretation of human experience.
- Students should understand that gender is socially constructed. They should be able to analyze family, education, labor, religion, and government as they are shaped by gendered constructs. Further, they should be able to explain how gender intersects with other constructed patterns of privilege and oppression in society, such as race, ethnicity, class, and sexual orientation.
- Students should develop skills in the application of gender research and theory to problems in the contemporary world.

Global Awareness

The world is becoming increasingly interconnected, and students must develop the intercultural skills that will allow them to participate effectively in the global community.]

Learning Outcomes

Students should have an understanding of the nature of the global community and the complexities of modern society in an international context.

- Students should understand how experiences across cultural and social boundaries challenge cultural-centric preconceptions. Students should understand the complexity and connectedness of the world. Students should recognize the international dimensions of academic disciplines.
- Students should be able to understand divergent points of view in the global community. They should recognize and respect a culture or society that is different from their own and comprehend some of its connections with other parts of the world.
- Students should understand the development of cross-cultural differences. They should adopt responsible approaches to global issues and policies.

Community Engagement

TCNJ seeks to prepare its students to sustain and advance the communities in which they live. All incoming students at TCNJ participate in a project or experience that is not only educational for the students but also helps improve the quality of life for others in our region.

Learning Outcomes

Students should seek to sustain and advance the communities in which they live by engaging in an informed and academically based service experience.

- Students should think critically, analytically, and inclusively about their society. They should develop a hands-on understanding of class, power, and privilege.
- Students should develop the means to apply the knowledge they gain from their academic experiences within the context of everyday community life. They should understand how to accept responsibility for active and engaged citizenship in a complex and diverse society.

Broad Areas of Human Inquiry

Literary, Visual, or Performing Arts

Students should cultivate a love of human expression in the arts.

- Students will be able to understand how the literary, visual, and performing arts reflect and inspire the richness of human expression, and how language and other forms of expression convey meaning and story.
- Students will be able to analyze how forms of expression are used to reflect, exalt, or challenge the values of a culture.
- Students will be able to explain the many purposes for which art is created and the multiple contexts in which it acquires meaning and value.
- Students should acquire perceptual habits and conceptual lenses conducive to the appreciation of specific media, genres, and styles.

Worldviews and Ways of Knowing

Students should think critically about what it means to be human, and to explore and interpret the human place in the universe.

- Students will be able to think critically about how human beings are able to gain knowledge beyond the limits of their own personal experiences.
- Students will be able to identify and explain how theories are challenged and defended in different areas of human inquiry.
- Students should be able to formulate a point of view on the intersection of science, religion, politics, and other forms of culture.
- Students should develop imaginative and conceptual skills needed to compare and evaluate alternative worldviews.

Behavioral, Social, or Cultural Perspectives

Students should understand the social context within which they live, and understand how the social dynamics of human behavior and the structures of social institutions influence beliefs and actions.

- Students should be able to understand the dynamics of human behavior in social interactions. They should recognize the fundamental factors that shape themselves in relationship to others.
- Students should understand the nature of human social relationships. They should know how people construct relationships within family, schools, work, and communities.
- Students should be able to understand how major social institutions organize and regulate social life, and allocate resources according to prevailing and alternate cultural values. They should be able to examine the balance of collective and individual interests

and examine how social systems and cultural values are used to perpetuate patterns of privilege and inequality.
- Students should be able to analyze the impact of major social institutions such as the family, economy, education, government, and religion.
- Students should be able to gather information, analyze data, and draw conclusions in selected areas of the social sciences.

Social Change in Historical Perspective
Students should understand how social contexts change over time and how human events have been, and continue to be, shaped by social and historical forces.
- Students should acquire an informed and critical understanding of change in societies. They should understand broad patterns of social development in pre-modern and modern societies.
- Students should appreciate the wide range of actors; women and men, elites and ordinary people, classes and ethnic groups; and their role in social change.
- Students should understand how historical information is acquired and relevant hypotheses confirmed or disconfirmed. They should gain skills in comprehending both secondary works and primary sources, and develop a fluid and effective style of writing and speaking about social change.

Natural Science
Students should understand the process of scientific investigation and the major features of scientific reasoning as they develop a selected, substantive knowledge of basic natural science content.
- Students should be able to understand distinctive ways in which information is acquired in the natural sciences. They will be able to appreciate differences between basic and applied research in natural science.
- Students will be able to understand the concept of "theory" and the use of models in natural science. They will be able to gain familiarity with the process of hypothesis testing as applied to investigations conducted by natural scientists.
- Students will be able to explain how the basic natural sciences interface with one another.
- Students will be able to understand how modern societies are constructed on an infrastructure of technological and scientific advances and be familiar with landmark discoveries that shaped at least one natural science discipline. They will understand how natural scientists evaluate social problems and formulate ethical solutions that incorporate scientific reasoning and the application of appropriate scientific principles.

- Students should acquire a substantive body of factual natural science knowledge, principles, and concepts, including proper use of scientific terminology and vocabulary.

<u>Quantitative Reasoning</u>

Students should understand quantitative reasoning so they can respond effectively to claims deriving from quantitative arguments.

- Students will understand how real-world problems and social issues can be analyzed using the power and rigor of quantitative methods while also learning to recognize and articulate the limitations of these methods.
- Students will be able to do all of the following: evaluate, interpret, and draw inferences from mathematical models such as algorithms, formulas, graphs, and tables.
- Students will be able to use quantitative methods (such as algebra, geometry, statistics and computation) to solve problems.