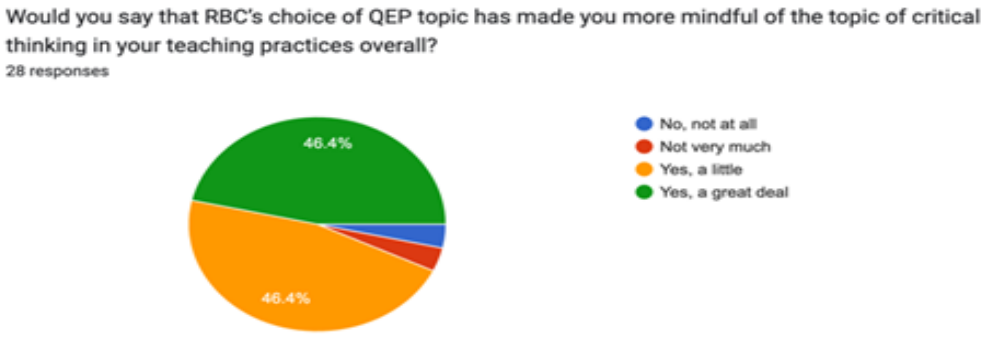
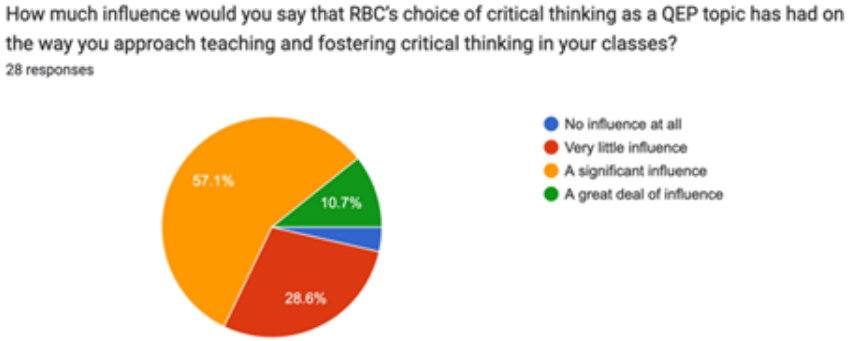
Critical Thinking

Richard Bland College's most recent five year "Quality Enhancement Program" (QEP), which culminated in 2023, was focused on the topic of critical thinking. The faculty identified five student learning outcomes related to critical thinking that included skills such as clearly formulating questions, evaluating and synthesizing sources of information, and articulating a clear position on a topic. During the course of the QEP, faculty devoted their professional development and curricular design efforts to developing these critical thinking skills and better assessing student evidence of those skills. One survey (see chart below) showed that more than 90% of full-time faculty responded that the QEP made them more mindful about critical thinking in their teaching practices.



Further, nearly 70% (see chart below) said that the five-year QEP had a significant influence on the way they approach fostering and assessing critical thinking in their classes.



Assessment

Student learning outcomes across the RBC curriculum were mapped one-on-one to our critical thinking outcomes, which allowed course-level assessment to be mapped onto these critical thinking skills. In addition, course surveys asked students to identify how often they were given the opportunity to develop and demonstrate their critical thinking skills in each course. As shown in the chart below, results indicated that by Spring of 2022, more than 80% of students had achieved mastery in 4 out of 5 of the critical thinking learning outcomes, and that the vast majority of students (>82%) reported that their courses gave them the opportunity to develop and demonstrate their critical thinking skills. While these numbers decreased a bit as the impact of the Covid-19 pandemic was felt, our focus on measuring student critical thinking allowed us to respond to the challenges posed by this disruption.

	Percentage of students meeting or exceeding learning outcome mastery							
QEP Critical Thinking Learning Outcome	*F19*	*S20*	*F20*	*S21*	*F21*	*S22*	*F22*	*S23*
Clearly articulate a question or define a problem	67.8%	89.2%	75.6%	85.1%	84.1%	81.6%	61.8%	57.5%
Gather and evaluate sources of information	84.7%	72.4%	88.8%	82.5%	66.7%	85.9%	58.6%	70.2%
Summarize and critique the arguments and reasoning of others	72.3%	72.4%	70.9%	67.8%	69.4%	77.3%	70.9%	65.5%
Construct a well-formed argument or line of reasoning	69.1%	78.3%	67.3%	72.7%	87.8%	83.5%	70.0%	75.8%
Identify connections, synthesize information, and draw informed conclusions	N/A	79.9%	70.8%	72.0%	91.5%	91.2%	65.1%	91.9%

Student Course Evaluations

During the 2019/2020 academic year, Richard Bland College incorporated additional questions into the student course evaluation forms that are distributed at the end of each semester for all courses. These supplemental questions measure students' self-reported frequency of engagement with higher-order reasoning skills, synthesis and application of concepts, and critical thinking activities. The enhanced evaluation

instrument includes the following statements for students to rate their level of agreement regarding their course experience:

- This course provided me with frequent opportunities to *demonstrate* my critical thinking skills.
- This course provided me with frequent opportunities to *develop* and *improve* my critical thinking skills.
- The professor in this course frequently *models* the critical thinking process.

	Percentage of students who agree or strongly agree							
QEP Course Evaluation Question	*F19*	*S20*	*F20*	*S21*	*F21*	*S22*	*F22*	*S23*
This course provided me with frequent opportunities to *demonstrate* my critical thinking skills	80.3 %	85.7 %	81.3 %	84.7 %	83.4 %	83.5 %	79.2 %	83.5 %
This course provided me with frequent opportunities to *develop* and *improve* my critical thinking skills.	80.4 %	85.4 %	80.9 %	84.4 %	81.5 %	83.8 %	78.7 %	82.5 %
The professor in this course frequently *models* the critical thinking process	81.1 %	85.6 %	80.4 %	83.3 %	81.2 %	82.0 %	78.5 %	81.2 %

The QEP Proposal established a success benchmark stating that "80% of students will report spending a significant amount of time in their courses developing and

demonstrating higher-order thinking skills." Course evaluation data indicate that the majority of students agree they receive opportunities to demonstrate and enhance their critical thinking abilities. The 80% success threshold was met from the initial implementation, providing positive evidence that students perceive meaningful opportunities to experience, develop, and apply critical thinking skills within their coursework.

Looking ahead

More recently, with the advent of artificial intelligence and large language models, there have been concerns expressed in academia about students offloading more and more of their higher-order thinking skills to AI tools. Current professional development efforts at RBC are focused on harnessing AI as a powerful new tool for learning while developing innovative assessment methods that allow us to probe for student critical thinking without the mediating influence of AI/LLMs acting as a replacement for those skills.

During the 2023/24 academic year, the college took up the task of revising its learning outcomes across the entire curriculum. With the recent focus on critical thinking in mind, student learning outcomes were rewritten with an eye towards being more explicit about where and how we are evaluating critical thinking skills in our courses. As a result of this process, the learning outcomes for every course at the college are now more reflective of our efforts to foster and assess critical thinking in our students.

Critical Thinking: 2023-2024

Throughout the 2023-24 academic year, RBC maintained its emphasis on critical thinking development by systematically gathering assessment data on student achievement. This assessment focused on classes that RBC had previously identified in the QEP as measuring Critical Thinking.

Fall 2023:

A sample of that data from the Fall 2023 semester and suggestions for improving students' critical thinking is available below.[1]

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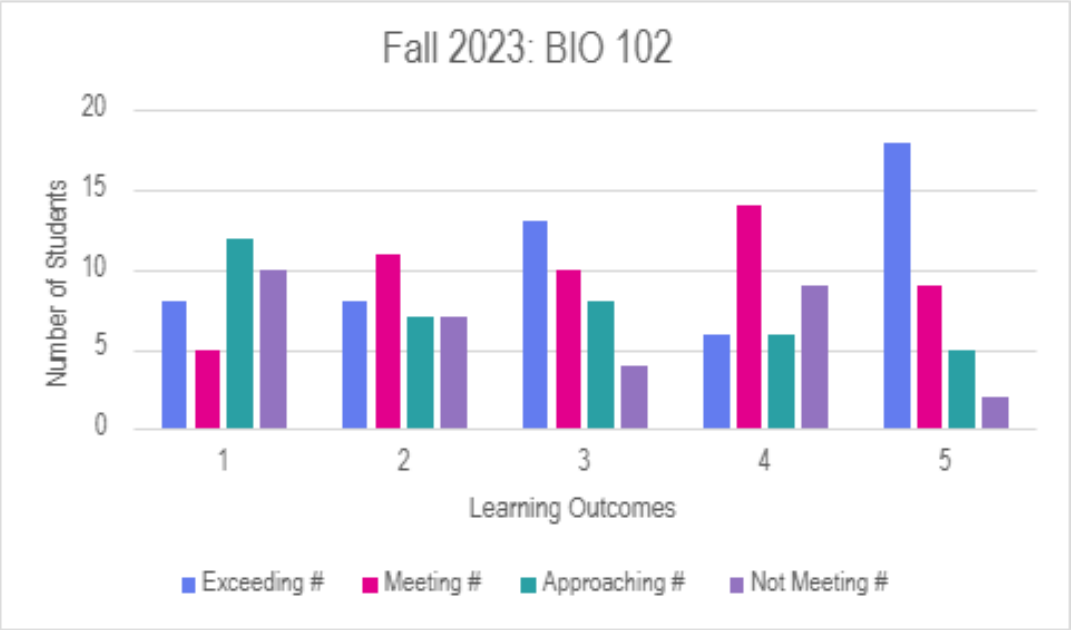
[1] These courses were selected for analysis based on their high enrollment numbers and broad student participation. One course was chosen from each of the three academic departments to ensure a representative sample across disciplines.



BIO 102 Learning Outcomes:

1. Describe anatomical concepts related to animals, including humans, relative to the structure and function of organ systems and tissues.
2. Identify basic reproductive life cycles and developmental processes in animals
3. Explain the structure/function relationship of plants with their environment and with other organisms.
4. Examine and compare anatomical differences that evolved in Plants and Animals that allow for survival in a particular ecosystem.
5. Explain the interconnectedness between the natural, ecological influences relevant to population-based life on Earth.

Findings: Based on the BIO 102 Fall 2023 data, student achievement shows notable variation across the five assessed learning outcomes. Learning Outcome 5 stands out with the strongest performance, as approximately 18 students exceeded expectations. In contrast, Learning Outcome 1 reveals the greatest concern, with the fewest students meeting or exceeding standards and a relatively high number falling below expectations. Learning Outcomes 2 and 3 display more balanced distributions, though Learning Outcome 4 is notable for having the highest number of students meeting expectations (around 14 students). These results suggest that while students are generally successful with Learning Outcome 5, Learning Outcome 1 may present instructional or conceptual challenges that merit further attention.

Opportunities to Improve Critical Thinking in BIO 102

Based on the data, here are some suggestions for improving student performance in critical thinking:

1. Identify Underperforming Areas

- Use real-world biological scenarios that require students to apply concepts.

2. Strengthen Scientific Reasoning

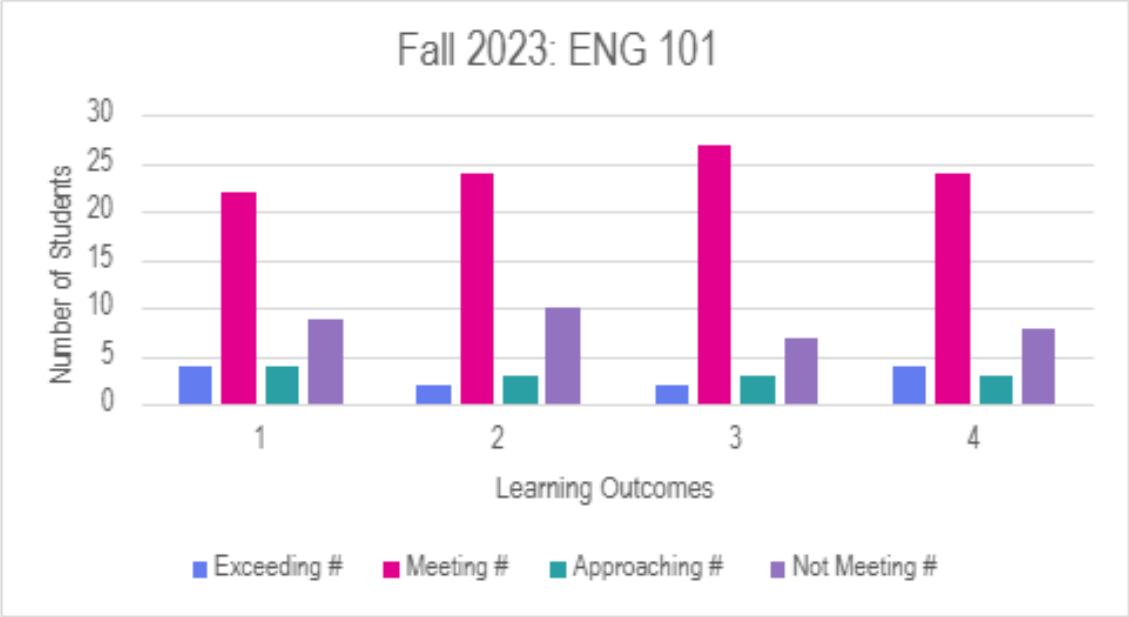
- Have students design mini-experiments or critique experimental setups.

3. Integrate Cross-Topic Thinking

- Assign synthesis essays that require integrating knowledge across units (e.g., how plant biology supports ecological systems).

4. Reflective Practice

- Add metacognitive prompts that require students to reflect on how they approached a problem and what they might do differently.



ENG 101 Learning Outcomes:

1. Demonstrate attention to the audience, purpose, context, and strategy of persuasion in a variety of texts
2. Demonstrate critical attention to claims, reasons, evidence, and assumptions
3. Ethically incorporate appropriate and relevant sources with an awareness of their accuracy, contexts, purposes, and points of view using in-text and bibliographic citation
4. Conform to conventions and expectations of scholarly discourse

Findings: Based on this ENG 101 Fall 2023 data, student achievement shows a consistent pattern across all four learning outcomes, with the vast majority of students meeting expectations (around 22-27 students per outcome). The performance is consistent, with few students exceeding expectations (2-4 students per outcome) and relatively small numbers approaching or not meeting standards (typically 3-9 students combined in these categories). Learning Outcome 3 demonstrates the strongest overall performance with the highest number of students meeting expectations and the fewest students in the lower performance categories. This data suggests that while students are generally achieving competency in ENG 101 learning outcomes, there may be some opportunities for advanced achievement.

Opportunities to Improve Critical Thinking in ENG 101

Based on the data above, here are some suggestions for improving student performance in critical thinking:

1. Strengthen Argumentation and Analysis

- Have students dissect persuasive techniques in editorials or essays.

2. Scaffold Research Skills

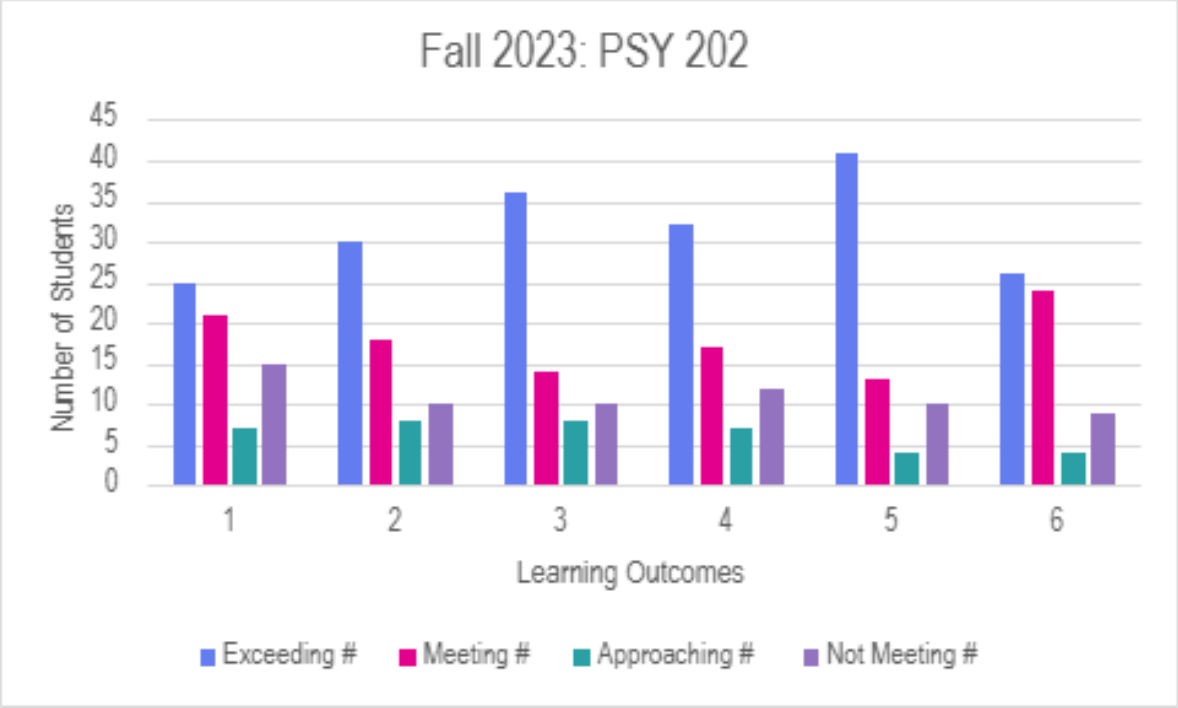
- Use step-by-step assignments (e.g., source evaluation, annotated bibliographies) to break down the research process.
- Show how to integrate multiple sources into a coherent argument to model the process of synthesis

3. Encourage Metacognition

- Reflective writing: Ask students to explain their reasoning behind revisions or source choices.

4. Emphasize Clarity and Precision

- Analyze well-written student or professional essays to model effective writing.



PSY 202 Learning Outcomes:

1. The student will define and understand basic psychological terms. Competency will be assessed by correctly answering test questions about term definition and comprehension
2. The student will interpret intelligence test scores and explain the use of intelligence testing in the fields of education and psychology. Competency will be assessed by correctly answering test questions about intelligence testing.
3. The student will describe the major theories of personality. Competency will be assessed by correctly answering test questions about personality theories.
4. The student will recognize and classify major psychological disorders. Competency will be assessed by correctly answering test questions about psychological disorders.
5. The student will identify the major therapeutic approaches and techniques used in clinical setting.
6. The student will apply psychological constructs to human behavior in groups. Competency will be assessed by correctly answering test questions about social and applied psychology.

Findings: Based on this PSY 202 Fall 2023 data, student achievement shows strong overall performance with a notable pattern of high numbers of students exceeding expectations across most learning outcomes. Learning Outcome 5 demonstrates

exceptional performance with approximately 42 students exceeding expectations, making it the strongest area of achievement. Learning Outcomes 2, 3, and 4 also show impressive performance with 30-35 students exceeding expectations each, while Learning Outcomes 1 and 6 show more moderate but still positive results with around 25 students exceeding in each area. The consistently low numbers of students "not meeting" expectations (typically 8-15 students) across all outcomes suggests effective instruction and appropriate assessment alignment. This data indicates that PSY 202 students are not only meeting basic competencies, but are achieving high levels across the curriculum, particularly in Learning Outcome 5.

Opportunities to Improve Critical Thinking in PSY 202

Based on the data above, here are some suggestions for improving student performance in critical thinking:

1. Apply Theory to Practice

- Use case studies where students diagnose disorders or recommend therapeutic approaches.

2. Strengthen Evaluation Skills

- Have students critique psychological tests for validity, reliability, and ethical use.

3. Encourage Ethical and Reflective Reasoning

- Use ethical dilemmas in therapy or testing scenarios to prompt discussion and reflection.

4. Promote Research Literacy

- Require students to analyze empirical studies related to therapy outcomes or personality assessments.
- Teach students to identify bias and limitations in psychological research.

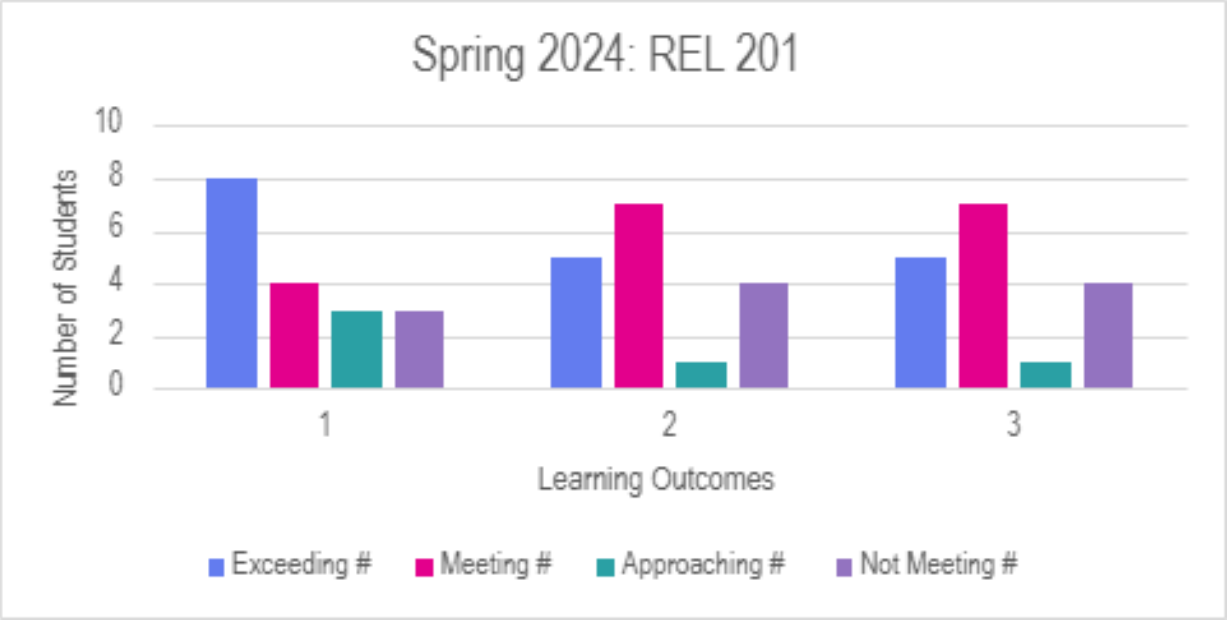
5. Foster Interdisciplinary Thinking

- Connect psychological theories to sociological, biological, or cultural contexts.

Fall 2023 findings: The data from Fall 2023 course performance data reveals distinct achievement patterns across three introductory courses. BIO 102 shows the most variable performance, with Learning Outcome 5 demonstrating strong results (18 students exceeding expectations) while Learning Outcome 1 presents significant challenges requiring instructional attention. ENG 101 exhibits consistent but modest achievement across all four learning outcomes, with most students meeting expectations (22-27 per outcome) but few reaching advanced levels (2-4 exceeding per

outcome), suggesting limited opportunities for high-level performance differentiation. In contrast, PSY 202 demonstrates exceptional overall success with impressive numbers of students exceeding expectations across all outcomes, particularly Learning Outcome 5 with 42 students achieving advanced performance, indicating effective instruction and well-aligned assessments.

Spring 2024:
A sample of that data from the Spring 2024 semester and suggestions for improving students' critical thinking is available below:



REL 201 Learning Outcomes:

1. Recognize various conceptions of religion and the Sacred, along with implications of these contrasting forms of religion regarding canonical themes and issues
2. Recognize canonical assessments of religious claims/ beliefs from both analytic-empirical and functional/ pragmatic points of view
3. Summarize and assess religious claims and experiences via canonical theories and criteria.

Findings: Based on this REL 201 Spring 2024 performance graph, student achievement shows mixed results across the three learning outcomes. Learning Outcome 1 demonstrates the strongest performance with 8 students exceeding expectations, while Learning Outcomes 2 and 3 show more balanced distributions with higher numbers of

students meeting expectations (7 students each) compared to exceeding. The consistently low numbers of students "approaching" expectations (1-3 students per outcome) suggests that most students are achieving at least meeting-level competency. However, the presence of 3-4 students "not meeting" expectations in each learning outcome indicates some students are struggling with course material, which may warrant targeted intervention strategies.

Opportunities to Improve Critical Thinking in REL 201

Based on the data above, here are some suggestions for improving student performance in critical thinking:

1. Deepen Conceptual Analysis

- Use concept comparison charts to help students differentiate between theories.

2. Encourage Theoretical Application

- Have students apply psychological or sociological theories to modern religious practices or personal experiences.

3. Promote Reflective and Ethical Reasoning

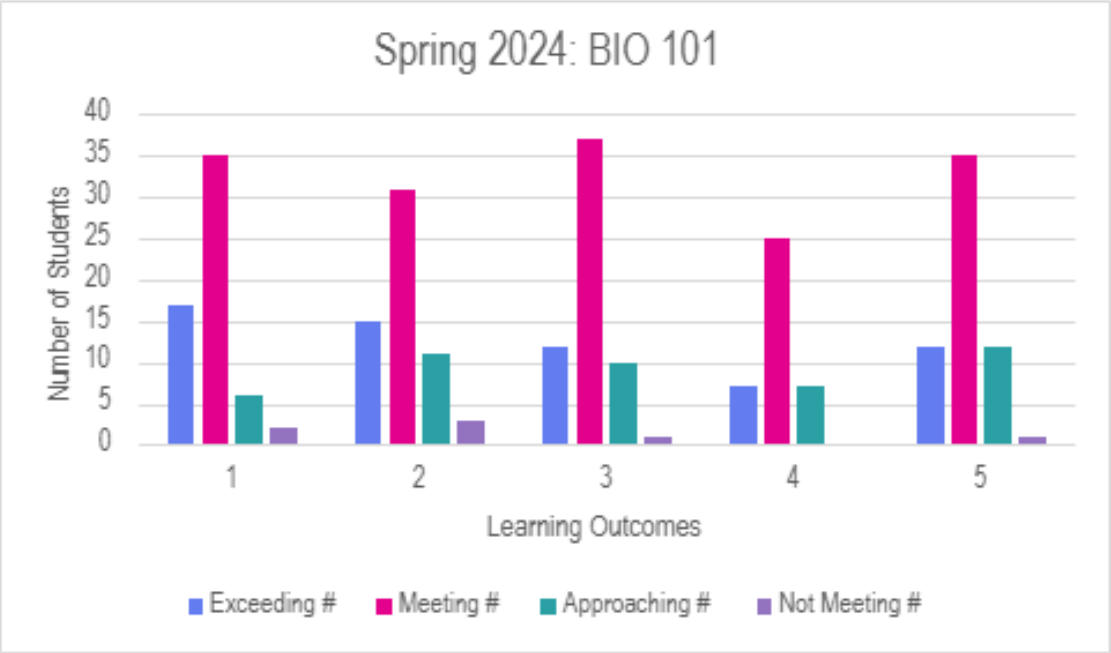
- Include guided reflection prompts that ask students to connect course concepts to personal or cultural experiences.

4. Strengthen Argumentation and Evidence Use

- Require evidence-based writing using scholarly sources to support interpretations of religious phenomena.

5. Integrate Artistic Interpretation

- Assign multimodal projects (e.g., analyzing religious themes in music or visual art).



BIO 101 Learning Outcomes:

1. Describe the structure/function relationships at all levels of biological organization, from the chemical and physical properties of molecules and cellular structures to their developmental and evolutionary context.
2. Discuss the flow of genetic information, from gene/protein expression and regulation to the multiple molecular mechanisms used to respond to environmental change.
3. Explain the laws of energy and matter, the biochemical mechanisms of energy conversion in plants and animals, and the role evolution plays in the efficient use of resources.
4. Describe the molecular mechanisms of evolution, how new species can arise, and the importance of natural selection and relative fitness within a population.
5. Explain the inter-relatedness of complex biological networks and how these systems are controlled and respond to environmental changes.

Findings: Based on this BIO 101 Spring 2024 data, student achievement shows strong overall performance with the majority of students meeting expectations across all five learning outcomes (30-37 students per outcome). Learning Outcome 3 demonstrates the highest achievement with approximately 37 students meeting expectations and 11 exceeding, while Learning Outcome 4 shows relatively weaker performance with fewer students exceeding expectations (around 7) compared to other outcomes. The data reveals consistently low numbers of students "not meeting" expectations (typically 1-3

students), indicating effective instruction and student success for that curriculum. However, there appears to be room for improvement in helping more students reach the "exceeding" level, as most outcomes show only 11-17 students in this category.

Opportunities to Improve Critical Thinking in BIO 101

Based on the data above, here are some suggestions for improving student performance in critical thinking:

1. Strengthen Scientific Reasoning

- Use inquiry-based labs where students must design and revise experiments.
- Include case studies that require evaluating flawed experimental setups.

2. Promote Data Interpretation

- Assign graphing and data analysis exercises using real biological datasets.
- Use peer review of lab reports to encourage critique and refinement of conclusions.

3. Connect Concepts Across Topics

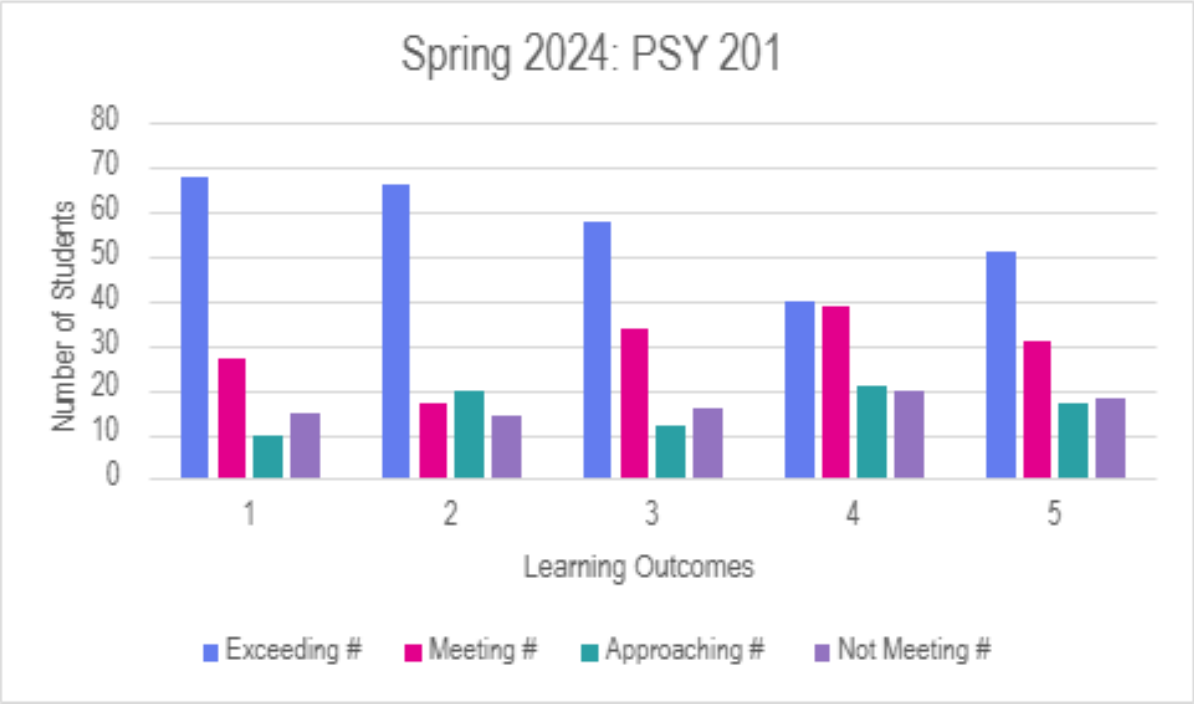
- Use concept maps to help students visualize relationships between topics.

4. Encourage Application to Real-World Issues

- Use current events (e.g., genetic engineering, biodiversity loss) as discussion prompts.

5. Support Metacognitive Growth

- Include reflection prompts in lab notebooks (e.g., “What did I learn?” “What questions remain?”).



PSY 201 Learning Outcomes:

1. The student will define basic psychological terms and demonstrate competency by correctly answering test questions about psychological terms.
2. The student will describe brain physiology and explain basic neural transmission and its application to human behavior. Competency will be demonstrated by correctly answering test questions about brain physiology and neural transmission.
3. The student will apply various constructs associated with the field of psychology (e.g. learning, sensation, perception, and memory) to daily life and demonstrate competency by correctly answering test questions about these constructs.
4. The student will critically evaluate psychological research findings and demonstrate competency by correctly answering test questions about psychological research.
5. The student will apply basic concepts of human development to life experiences such as parenting and negotiating developmental stages of life and demonstrate competency by correctly answering test questions about human development.

Findings: Based on this PSY 201 Spring 2024 data, student achievement shows exceptional performance with a high number of students exceeding expectations across most learning outcomes. Learning Outcomes 1 and 2 demonstrate impressive results with approximately 65 students exceeding expectations in each area, while Learning

Outcomes 3 and 5 also show strong performance with around 55 and 50 students exceeding, respectively. Learning Outcome 4 presents a notably different pattern with more balanced distribution between exceeding (around 40 students) and meeting expectations (around 38 students), suggesting this may be a more challenging competency area. The consistently low numbers of students "not meeting" expectations (typically 12-18 students) across all outcomes indicates effective instruction, though data for Learning Outcome 4 suggests the need for a targeted approach.

Opportunities to Improve Critical Thinking in PSY 201

Based on the data above, here are some suggestions for improving student performance in critical thinking:

1. Strengthen Conceptual Understanding

- Use concept mapping to help students visualize relationships between theories and processes.
- Assign short essays or discussion posts comparing different psychological approaches (e.g., behaviorism vs. cognitive psychology).

2. Apply Psychology to Everyday Life

- Use real-life scenarios (e.g., motivation in sports, emotional regulation in relationships) for students to analyze using psychological principles.
- Include reflection assignments where students connect course topics to personal experiences.

3. Promote Analytical Thinking

- Assign research critiques where students assess the methodology and conclusions of psychological studies.
- Use structured debates on topics like the ethics of psychological testing or the role of nature vs. nurture.

4. Encourage Scientific Reasoning

- Include mini-lab activities or simulations that require hypothesis testing and data interpretation.
- Teach students to identify bias and limitations in psychological research.

5. Support Developmental Integration

- Use lifespan case studies to explore how psychological principles apply across different ages.
- Assign timeline projects that trace development of cognitive or emotional traits.

Spring 2024 Findings: The data from Spring 2024 courses reveal dramatically different achievement levels across three courses with varying enrollment sizes. REL 201, with its small class of approximately 15-17 students, shows mixed results where Learning Outcome 1 performs strongest (8 students exceeding) while 3-4 students consistently struggle across all outcomes, suggesting opportunities for individualized intervention. BIO 101 demonstrates solid overall performance with 30-37 students meeting expectations across five learning outcomes, though relatively few students (11-17) reach the exceeding level, indicating potential for advancing more students to higher achievement. In contrast, PSY 201 exhibits exceptional results with 50-65 students exceeding expectations across most learning outcomes, particularly excelling in Outcomes 1 and 2, though Learning Outcome 4 presents a more balanced distribution that may require targeted instructional attention despite the course's overall outstanding performance.

Critical Thinking Recommendations:

Faculty across disciplines can enhance students' critical thinking by implementing a variety of intentional strategies. Scaffolding higher-order thinking is essential, and this practice can be accomplished by using guided questions and structured assignments that lead students through analysis, evaluation, and synthesis. Faculty can also model critical thinking during lectures, walking students through the steps the professor takes when addressing a question. Reflective writing prompts, journals, and peer review activities also encourage reflection and metacognition, helping students become more aware of their reasoning processes. Further, connecting course content to real-world contexts through case studies, simulations, and current events fosters relevance and deeper engagement. Strengthening argumentation and evidence use is also key, requiring students to support claims with credible sources and evaluate the strength of arguments. Finally, integrating cross-topic and interdisciplinary thinking—such as concept maps, synthesis essays, and comparative analyses—helps students build connections across units and disciplines, promoting a more holistic and critical understanding of course material.