

1.d Program Mission Statement

The mission of the undergraduate program in Human Biology is to provide students with an interdisciplinary approach to understanding human beings from biological, behavioral, social, and cultural perspectives. Courses in the major allow students to see connections and parallels with other fields as they learn to formulate and evaluate health, environmental, and other public policy issues that influence human welfare. The program prepares majors to pursue advanced training in professional or graduate programs.

1.e Undergraduate Program Learning Outcomes

The program expects its undergraduate majors to be able to demonstrate the following learning outcomes:

Three capacities—communication, data analysis, and scientific literacy—will be cultivated in the major from the Core through upper division classes to honors research and other capstone experiences.

COMMUNICATION

Because Human Biology is an interdisciplinary program with an emphasis on both empirical inquiry and applied knowledge, excellent communication skills are critical to majors. Successful students must be able to engage with literatures and audiences not only from multiple disciplines but also with varying levels of subject expertise and to communicate information and ideas clearly, precisely, concisely, and purposefully in any setting. Toward this end, all Human Biology majors by time of graduation should be able to:

- adopt an appropriate style for written communication in the biological and social sciences
- accurately summarize a scientific article
- synthesize and criticize multiple sources of scientific literature
- revise effectively in response to feedback
- write collaboratively
- present information visually in a variety of forms (charts, graphs, figures, and posters) for different audiences, purposes, and occasions
- communicate in a variety of major scientific genres (such as abstracts, literature reviews, posters, research proposals, research presentations, and policy proposals) and popular genres (such as op-eds, PSA, podcasts, and science blogs)
- use citations to provide context and to credit others for their intellectual contributions
- communicate scientific knowledge to both specialist and non-specialist audiences
- construct a well-supported, logical argument based on relevant evidence and established conceptual frameworks
- frame a research question in relation to the current state of knowledge in a field
- articulate a well-reasoned hypothesis
- listen to any speaker and pose questions
- deliver an oral presentation and respond to audience questions

DATA ANALYSIS

Data are used in the social and biological sciences to make observations and judgments regarding patterns of human behavior and function. These data are sometimes imperfect or incomplete, but they are used nevertheless to make decisions and policies regarding humans individually and in groups within the worlds they inhabit. Thus, students should cultivate a capacity within the Human Biology major to examine and analyze data. A graduate of Human Biology should be able to”

- recognize that different scientific disciplines draw on various sources and types of evidence
- translate a research topic into a hypothesis or focused question that can be tested using quantitative or qualitative data
- identify variables that are relevant to a study and describe their nature (e.g. categorical, continuous) and interrelationships (independent, dependent, covariates)
- use statistical software to summarize and describe data of various types
- choose an appropriate analytical framework or statistical model for testing a given hypothesis, considering the structure of the data (e.g. sample size, distribution, qualitative or quantitative nature).
- employ quantitative or qualitative data to support a conclusion
- judge whether a statistical association provides empirical support for causation
- detect mistakes commonly made in empirical reasoning and data analysis
- assess the limits of available data and identify potential sources of uncertainty
- present data accurately, clearly, and effectively in the forms of tables, graphs, and figures
- explore specialized modes of data analysis such as meta-analysis, bioinformatics, modeling, and epidemiological approaches

SCIENTIFIC LITERACY

The Program in Human Biology prepares students to join a broad scientific community with a culture of building and sharing knowledge. A goal of the major is to cultivate judicious consumers of research in the natural and social sciences, irrespective of their future career path. Every Human Biology major should be able to:

- appreciate the distinct roles of common genres of scientific writing, including peer-reviewed research papers, review articles, commentaries, and popular science writing
- acknowledge and apply the normative and ethical standards of conducting and publishing research, including accuracy, transparency, and responsibility to colleagues and subjects
- evaluate the credibility and importance of a published article and its relevance within a field
- engage with peer-reviewed scientific literature actively and critically
- identify research questions, understand their theoretical or practical importance
- assess research methodologies and experimental or other study design
- evaluate evidence and statistical analyses presented in support of claims
- interpret data presented in a table, graph, or figure
- use a hypothesis or framework to make predictions or pose questions about a novel setting

1.f Assessment Design	
Assessment Question	“To what extent are students able to acquire, synthesize, analyze and communicate scientific information?”
Nature of Student Work or Performance	<p>This assessment report was based on eight assignments from our Human Biology Core courses which are required for all Human Biology majors. The assignments require different combinations of the communication, data analysis and scientific literacy capacities listed above.</p> <p>The eight assignments that were collected and assessed were:</p> <p>Two short (<500 word) academic writing assignments requiring students to produce figures using a spreadsheet program (HUMBIO2A)</p> <p>Two short (<500 word) academic writing assignments in which students received feedback on drafts from the Course Associates (Assignment-I) or their peers (Assignment-II) and were expected to revise their work in response to feedback (HUMBIO2B)</p> <p>A 2-minute public speaking assignment (HUMBIO2B)</p> <p>A conference poster assignment in which students worked in pairs and were asked to read and give a presentation on scientific articles (HUMBIO3B).</p> <p>A grant proposal assignment in which students posed a research question related to their conference poster (HUMBIO3B).</p> <p>A policy proposal collaborative writing assignment (the Writing in the Major assignment). Students worked in groups of three or four and received feedback on drafts from the Course Associates and were expected to revise in response to feedback (HUMBIO4B).</p>
How Student Work will be Analyzed	The assignments and projects were scored by Course Associates (full time teaching assistants) using rubrics that were established by the Human Biology Core faculty and CAs in collaboration with writing and oral communication specialists. The Course Associates all received training in giving feedback on writing and oral communication assignments and also met to normalize grading procedures for each assignment.
Other Notes on the Assessment Design	

1.g Learning Outcomes Rubric				
	Unacceptable	Marginal	Proficient	Exemplary
<p>Learning Outcomes #1- Students will use a spreadsheet program to model population growth and consider alternative projections under different conditions; explain the limitations and assumptions of the model and how the results should be interpreted. (HumBio2A Academic Writing- modeling processes in human ecology)</p>	<p>Assignment lacked the main elements assessed in the rubric (purposiveness, persuasiveness, coherence or clarity) or was submitted past the assignment deadline or not submitted. (0-60%)</p>	<p>Assignment lacked one or more of the main elements assessed in the rubric (purposiveness, persuasiveness, coherence or clarity) and/or included an incomplete or improperly labeled figure. (60-75%)</p>	<p>Assignment was generally purposive, persuasive, coherent and clear and included a figure, but did not incorporate all of the elements assessed in the rubric. (75-90%)</p>	<p>Purposive: Figure, including each scenario, choice of parameters, axes labels, and meaning of the lines are clearly described, Explains the context and purpose of generating the model, Language and tone are appropriate for colleagues and supervisor at the UN. Persuasive: Model calculations are accurate, Reasonable model parameters are selected, Choice of parameters are justified, Remarks include interpretation of results and discussion of assumptions Coherent: Unified sentence-to-sentence flow, Text refers to figure, Sentences are in a logical order Clear: Grammatically correct sentences, Sentences are direct and easy to follow, Essay is under the word limit Figure: Legible accurate axis labels, Appropriate figure legend, Caption that integrates figure with text (90-100%)</p>

<p>Learning Outcomes #2- Students will use a spreadsheet program and principles from population genetics to analyze gene frequency data from a real population; test hypotheses using appropriate statistics; use the analysis to reason about evolutionary forces acting on the population. (HumBio2A Academic Writing-applying statistical hypothesis testing in human genetics)</p>	<p>Assignment lacked the main elements assessed in the rubric (purposiveness, persuasiveness, coherence or clarity) or was submitted past the assignment deadline or not submitted. (0-60%)</p>	<p>Assignment lacked one or more of the main elements assessed in the rubric (purposiveness, persuasiveness, coherence or clarity) and/or included an incomplete or improperly labeled figure. (60-75%)</p>	<p>Assignment was generally purposive, persuasive, coherent and clear and included a figure, but did not incorporate all of the elements assessed in the rubric. (75-90%)</p>	<p>Purposive: Essay explains the context and purpose, Language and tone are appropriate for research advisor and other members of the research team, Figure is clearly described Persuasive: All calculations are accurate, Conclusions about prior results are well supported with data, Hypotheses are clearly stated, Research justification is clear Coherent: Unified sentence-to-sentence flow, Text refers to figure, Sentences are in a logical order Clear: Grammatically correct sentences, Sentences are direct and easy to follow, Essay is under the word limit Figure: Legible accurate axis labels, Appropriate figure legend, Caption that integrates figure with text (90-100%)</p>
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<p>Learning Outcomes #3: Students will reason like an evolutionary biologist; use historical (fossil) evidence and evolutionary theory to draw and support a conclusion.</p> <p>Students will respond to individualized feedback on a draft.</p> <p>(HumBio2B Academic Writing- reasoning in evolutionary biology)</p>	<p>Essay lacked the main elements assessed in the rubric (purposiveness, persuasiveness, coherence or clarity) or was submitted past the assignment deadline or not submitted. (0-60%)</p>	<p>Essay lacked one or more of the main elements assessed in the rubric (purposiveness, persuasiveness, coherence or clarity). (60-75%)</p>	<p>Essay was generally purposive, persuasive, coherent and clear, but did not incorporate all of the elements assessed in the rubric. (75-90%)</p>	<p>Purposive: Clear thesis is presented, Thesis responds to the prompt, Counterarguments are considered Persuasive: Factually accurate, Evidence presented is relevant to the thesis, Significance of evidence is clearly stated, Conclusions are clearly stated and well-supported, Demonstrates an accurate understanding of primitive and derived traits Coherent: Logical sentence-to-sentence flow, Strong topic sentences, Logically ordered sentences & paragraphs Clear: Grammatically correct sentences, Sentences are direct and easy to follow, Includes a list of sources, Essay is under the word limit (90-100%)</p>
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<p>Learning Outcomes #4:</p> <p>Students will reason like a social scientist; use evidence from historical trends to construct an argument about the influence of society and culture on human biology.</p> <p>Students will receive and give individualized feedback on drafts through peer review</p> <p>(HumBio2B Academic Writing- reasoning about culture and society)</p>	<p>Essay lacked the main elements assessed in the rubric (purposiveness, persuasiveness, coherence or clarity) or was submitted past the assignment deadline or not submitted. (0-60%)</p>	<p>Essay lacked one or more of the main elements assessed in the rubric (purposiveness, persuasiveness, coherence or clarity). (60-75%)</p>	<p>Essay was generally purposive, persuasive, coherent and clear, but did not incorporate all of the elements assessed in the rubric. (75-90%)</p>	<p>Purposive: Clear thesis is presented, Thesis responds to the prompt, Provides context to frame the argument for the reader, appropriate language and tone for academic context Persuasive: Evidence presented is accurate and relevant to the thesis, Significance of evidence is clearly stated, Conclusions are clearly stated and well-supported, Demonstrates an accurate understanding of Malthusian theory, Counterarguments are considered Coherent: Logical sentence-to-sentence flow, Strong topic sentences, Sentences and paragraphs are in logical order Clear: Grammatically correct sentences, Sentences are direct and easy to follow, Includes in-text citations and a list of sources, Essay is within the word limit (90-100%)</p>
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<p>Learning Outcomes #5:</p> <p>Students will give a brief presentation to peers and will connect specific lecture content to a larger theme of the course to deepen their own and others' understanding of course material</p> <p>Students will receive individualized feedback on the oral presentation from a Hume Center tutor prior to the peer presentation.</p> <p>(HumBio2B Public Speaking Assignment)</p>	<p>Presentation lacked in the main elements assessed in the rubric or was late or not completed. (0-60%)</p>	<p>Presentation lacked in several of the elements assessed in the rubric. (60-75%)</p>	<p>Presentation partially followed the main verbal, vocal and visual elements assessed in the rubric, but in lacked one or more areas that were assessed. (75-90%)</p>	<p>Verbal: Clear thesis that responds to the prompt, Factually accurate, Attribute factual information or quotations to proper sources, Appropriate language for an academic presentation, Present material in a way that is easy to follow and understand, using clear transitions, Has a clear conclusion</p> <p>Vocal: Appropriate volume, Appropriate pace, Avoid fillers, Vocal variety, Enunciate</p> <p>Visual: Appropriate gestures, Avoid distracting repetitive behaviors, Open body language, Facing the audience, Making eye contact (90-100%)</p>
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<p>Learning Outcomes #6: Students will create and present a scientific poster that summarizes and contextualizes a study from a peer-reviewed article in the biological or social sciences</p> <p>Students will receive peer feedback on the presentation prior to the final presentation.</p> <p>(HumBio3B Conference Poster)</p>	<p>Presentation lacked in the main elements assessed in the rubric or was late or not completed. (0-60%)</p>	<p>Presentation lacked in several of the elements assessed in the rubric. (60-75%)</p>	<p>Presentation partially followed the main elements assessed in the rubric, but lacked one or more areas that were assessed. (75-90%)</p>	<p>Completeness and Understanding: Included Research Question, Background, Methods and design, results and conclusion. Clarity and Organization of Poster: Clear poster design and layout, Clear communication of article content, appropriate and useful diagrams/charts. Analysis and Further Research Questions: Includes students critical commentary on article and proposals for further research Prepared Delivery: Organization of oral presentation, clarity of explanation, posture, speed, volume Q&A: Demonstrated understanding of content, Completeness and clarity of answers, Poise. (90-100%)</p>
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<p>Learning Outcomes #7: Students will propose a question to explore a gap in the scientific literature that follows from your poster presentation</p> <p>(HumBio3B Grant Proposal)</p>	<p>Proposal lacked the main elements assessed in the rubric (purposiveness, persuasiveness, coherence or clarity) or was submitted past the assignment deadline or not submitted. (0-60%)</p>	<p>Proposal lacked one or more of the main elements assessed in the rubric (purposiveness, persuasiveness, coherence or clarity). (60-75%)</p>	<p>Proposal was generally purposive, persuasive, coherent and clear, but did not incorporate all of the elements assessed in the rubric. (75-90%)</p>	<p>Purposive: Clear research question/hypothesis is presented, Proposal addresses all four elements (i.e. goals and objectives, significance, etc.) of the assignment, Research question clearly stems from engagement with the article presented in the poster session, Appropriate language and tone for academic context Persuasive :Significance of research question/hypothesis is clearly presented in relation to existing literature, Methodological choices are clearly stated, Suitability of the methodology is explained, Reasonable and specific identification of resources Coherent: Parts of the proposal work together as a coherent research plan, Unified sentence-to-sentence flow, Sentences and paragraphs are in a logical order Clear: Grammatically correct sentences, Sentences are direct and easy to follow, Includes a list of sources, Proposal is under the word limit (90-100%)</p>
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<p>Learning Outcomes #8: Students will use analysis tools from HumBio4B to create a well-reasoned policy proposal that addresses a significant health or environmental problem. Students will write collaboratively. (HumBio4B Policy Proposal)</p>	<p>Policy proposal lacked the main elements assessed in the rubric (purposiveness, persuasiveness, coherence or clarity) or was submitted past the assignment deadline or not submitted. (0-60%)</p>	<p>Policy proposal lacked one or more of the main elements assessed in the rubric (purposiveness, persuasiveness, coherence or clarity). (60-75%)</p>	<p>Policy proposal was generally purposive, persuasive, coherent and clear, but did not incorporate all of the elements assessed in the rubric. (75-90%)</p>	<p>Purposive: Content is relevant to and consistent with information provided in the background and proposed policy, Clear argument is presented, Argument responds to the prompt Persuasive: Analysis relevant and rigorous, Section shows proper use of policy evaluation tools, Sources/data/quantitative analysis used to support claims, Limitations of sources are acknowledged, Indicates main objective of project, Reasoning is sound and logical, Significant and effective engagement with counterarguments Coherent: Unified sentence-to-sentence flow, Strong topic sentences, Sentences and paragraphs are in a logical order, Argument is evident throughout Clear: Tone and approach establish credibility and professionalism, Grammatically correct sentences, Sentences are direct and easy to follow, Citations are used and cited appropriately (90-100%)</p>
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2. Collect and Assess Student Work

2.a Timeline of Assessment Activities		
Academic Year	Planned Activities (Fill in all rows of this column at the time the Assessment Plan is created, saying what you plan to do each year.)	Actual Assessment Activities Completed (Fill in one row of this column at the conclusion of each academic year, saying what activities were in fact completed.)
2016-2017	Collect and analyze student assignments: Academic Writing Assignments I & II (HumBio2A) Academic Writing Assignments I & II (HumBio2B) Public Speaking Assignment (HumBio2B) Poster Project Assignment (HumBio3B) Grant Proposal Assignment (HumBio3B) Policy Proposal Assignment (HumBio4B)	Student work was collected and scored for the assignments listed.

3. Results and Assessment Report

3.a Learning Outcomes Data Table

	Unacceptable	Marginal	Proficient	Exemplary	Total Number of Students Assessed on Each Dimension
<p>Learning Outcomes #1- Students will use a spreadsheet program to model population growth and consider alternative projections under different conditions; explain the limitations and assumptions of the model and how the results should be interpreted. (HumBio2A Academic Writing-modeling processes in human ecology)</p>	3 (2%)	3 (2%)	47 (25%)	131 (71%)	184
<p>Learning Outcomes #2- Students will use a spreadsheet program and principles from population genetics to analyze gene frequency data from a real population; test hypotheses using appropriate statistics; use the analysis to reason about evolutionary forces acting on the population. (HumBio2A Academic Writing applying statistical hypothesis testing in human genetics)</p>	3 (2%)	2 (1%)	32 (17%)	147 (80%)	184

<p>Learning Outcomes #3:</p> <p>Students will reason like an evolutionary biologist; use historical (fossil) evidence and evolutionary theory to draw and support a conclusion.</p> <p>Students will respond to individualized feedback on a draft.</p> <p>(HumBio2B Academic Writing-reasoning in evolutionary biology)</p>	2 (1%)	1 (1%)	48 (28%)	121 (70%)	172
<p>Learning Outcomes #4:</p> <p>Students will reason like a social scientist; use evidence from historical trends to construct an argument about the influence of society and culture on human biology.</p> <p>Students will receive and give individualized feedback on drafts through peer review</p> <p>(HumBio2B Academic Writing-reasoning about culture and society)</p>	1 (0.5%)	1 (0.5%)	29 (17%)	141 (82%)	172

<p>Learning Outcomes #5:</p> <p>Students will give a brief presentation to peers and will connect specific lecture content to a larger theme of the course to deepen their own and others' understanding of course material</p> <p>Students will receive individualized feedback on the oral presentation from a Hume Center tutor prior to the peer presentation.</p> <p>(HumBio2B Public Speaking Assignment)</p>	0 (0%)	2 (1%)	1(1%)	169(98%)	172
<p>Learning Outcomes #6:</p> <p>Students will create and present a scientific poster that summarizes and contextualizes a study from a peer-reviewed article in the biological or social sciences</p> <p>Students will receive peer feedback on the presentation prior to the final presentation.</p> <p>(HumBio3B Conference Poster)</p>	0 (0%)	0 (0%)	2(1%)	154 (99%)	156

Learning Outcomes #7: Students will propose a question to explore a gap in the scientific literature that follows from your poster presentation (HumBio3B Grant Proposal)	0 (0%)	0 (0%)	25(16%)	131 (84%)	156
Learning Outcomes #8: Students will use analysis tools from HumBio4B to create a well-reasoned policy proposal that addresses a significant health or environmental problem. Students will write collaboratively. (HumBio4B Policy Proposal)	0 (0%)	0 (0%)	16(10%)	137 (90%)	153

Notes: "Count" is the raw number and "%" the percentage of students evaluated who fall into each category (e.g. the number scored exemplary on learning outcome #1 divided by the total number of students assessed on learning outcome #1). **Please enter "0" when no students fall in a category; please do NOT leave any cells blank. Please check that percentages across each row sum to 100%, or note rounding error.** The table can be adapted to display trends over time or compare subgroups. Please contact ----- for assistance.

3.b Assessment Report	
<p>Written Summary of Assessment Results</p>	<p>In all eight of our assessments, over 95% of the students demonstrated proficiency in the learning outcomes that were measured.</p> <p>The students seemed to have the most room for improvement (the lowest percentage in the exemplary category) on the very first writing assignments at the beginning of the year. For both HumBio2A and HumBio2B the percentage of students in the exemplary category was higher for the second assignment by 9 and 12% respectively than the first.</p> <p>The students performed best on Learning Outcomes numbers 5 and 6. Both of these were oral communication assignments. For both of these assignments the students received feedback on their presentations from an oral communication tutor or from their peers prior to giving the presentations.</p> <p>The assignments listed for Learning Outcomes numbers 3,4, 6 and 8 were used in our previous assessment. For all four outcomes there were a higher percentage of students in the exemplary category than in our previous assessments.</p>
<p>Limitations of the Assessment Results</p>	<p>The assessment of learning outcome number 6 was from an assignment in which students were asked to work in pairs (the HumBio3B Conference Poster). The assessment of learning outcome number 8 was from an assignment in which students were asked to work in groups (the HumBio4B Policy Proposal).</p> <p>The assignments we have assessed draw on nearly all of the communication capacities, but only a portion of the data analysis capacities and scientific literacy capacities for the major.</p>
<p>What mechanisms will you use to share these results with program faculty?</p>	<p>The results will be shared with program faculty at faculty meetings.</p>

What changes in the program do these findings suggest?	The findings of our assessment suggest that the students performed well for all learning outcomes. We plan on continuing to use these assignments as part of our course and assessment plan. In the upcoming years, we plan to expand our assessment to include more of the learning outcomes particularly in data analysis.
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3.c Notes for the Next Assessment Cycle