

Lyman Briggs College

Honors Options - Guidelines and Best Practices

Document written by the LBC Educational Policy Committee
Last revised on 4/17/2014

The purpose of this document is to provide instructors of Lyman Briggs College courses with some guidance regarding Honors Options, including their purpose (Section 1), appropriate scope (Section 2), and some recommendations for best practices (Section 3). In addition, references for more information can be found on Section 4, and a list of example honors options from a range of LBC courses can be found in Section 5.

Section 1: The purpose of Honors Options

Students in the MSU Honors College [1] are expected to enrich their education by receiving honors credit in at least eight courses while attending MSU as an undergraduate. This credit can be obtained in three ways: by enrolling in Honors courses, by taking graduate coursework, and through “Honors Options.” The purpose of the Honors Option is to provide students with a method of getting Honors credit within an undergraduate non-Honors course, and is meant to be pursued with the agreement of, and assistance by, the instructor of the course. More broadly, **the Honors Option provides academically talented students in a course an enrichment opportunity by pursuing more extensive or more advanced work than is required of regular students in the course.** [2] Note that it is possible for non-Honors College students to pursue an Honors Option if they desire an enrichment opportunity in a course!

Section 2: The scope of Honors Options

According to the All-university guidelines for Honors Options in regular courses [3], “Honors work in a regular course presupposes more intensive or more extensive study for those students who opt for it. Arrangements should be made to give substantial demonstration of the results of this more individualized involvement with the course material.” Furthermore, “Because the student must demonstrate such involvement, a high grade for regularly required work does *not in itself* warrant the awarding of the H-designation.”

The LBC Educational Policy Committee has interpreted this to mean that an Honors Option project should be a creative activity or activities that broaden and/or deepen a student’s understanding of topical material related to the course in question. This could include, but is not limited to, a wide range of activities, such as: research papers, case studies, field work, or experiments, optionally culminating in a poster or talk at the Lyman Briggs Research Symposium or another venue; the creation of a video, podcast, software program, or webpage that is made available online; a performance, debate, or discussion done in front of the rest of the class; a regularly-scheduled seminar or discussion outside of normal class hours to explore

topics of interest; or a service-focused project [see 2 and 4 for more details about this last possibility]. **Please note that Honors Options can be pursued by a group of students working together; however, the scope of the project should be commensurately greater.**

We note that there are some activities that are not appropriate for Honors Option credit. This includes activities that are typically considered to be the purview of Teaching Assistants, Learning Assistants, or the course instructor, such as running help room, recitation, or exam review sessions, or tutoring other students in the class (unless it is part of a broader enrichment opportunity - i.e., if the honors option is part of a class on teaching methods and includes discussion about pedagogical techniques and practices). Furthermore, simply doing more work for a class without that extra effort substantially broadening or deepening students' understanding of the course material should not be considered sufficient for Honors credit. For example, doing extra problems or reading assignments would generally not be appropriate, unless by doing so students gain substantial knowledge beyond what was acquired by other students in the course.

Section 3: Recommendations for minimal requirements and best practices

Some recommendations for minimal requirements include:

- For students in the Honors College, a minimum course grade of 3.0 is suggested, and a higher minimum grade (i.e., 3.5 or 4.0) could be required at the instructor's discretion. The purpose of a grade minimum is two-fold: it helps to ensure that students have some basic level of mastery upon which to build their Honors project, and gives instructors an opportunity to have a conversation about priorities with students who are struggling in the course.
- For students not in the honors college, a similar or higher minimum grade should be instituted. In addition, such students may need more explicit guidance regarding the scope and process of Honors Options than students in the Honors College, due to lack of familiarity with the process.

Some recommendations for best practices include:

- Address the topic of Honors Options in your course syllabus and at the beginning of the semester, explicitly including a discussion of allowable projects and minimum requirements.
- Agreements between an instructor and student to undertake an Honors Option project should be reached no later than end of the first week of the term, and this agreement should be recorded in writing. [as suggested in 3]
- The details of the Honors Option should be made explicit, including scope, deadlines (both interim and final deadlines), and deliverables (paper, project, poster, etc.). This should also be recorded in writing.
- It should be made clear to students that failing to complete an agreed-upon Honors Option (either on time or at all) will not negatively affect their grade in the course in question, and that their main priority should be mastering the materials taught in the class.

- In projects involving multiple students, each student's contribution to the project should be defined, and efforts should be made to ensure that each student participates at a comparable level. This should be recorded in writing, and shared with all students.
- In projects involving service learning, students **must** register with the Center for Service-Learning and Civic Engagement [4] prior to the beginning of their project.
- While it is acceptable for an Honors Option to be finished after the end of the semester (and in fact is quite common in Lyman Briggs), specific end dates should be set - for example, no later than the end of winter break, the end of summer break, or the middle of the semester following the course.
- Honors Option report forms [5] should be filled out as soon as possible following the completion of the H-option. Many faculty have found it useful to have the student(s) write a one-paragraph summary of their Honors Option, and use that as the project description in the H-Option report form.

Section 4: References

[1] MSU Honors College: <http://honorscollege.msu.edu/>

[2] Honors Option web page: <http://honorscollege.msu.edu/honors-option-0>

[3] All-university guidelines: http://honorscollege.msu.edu/honors-college/sites/default/files/content/h-o_guidelines.pdf

[4] Center for Service-Learning and Civic Engagement: <http://www.servicelearning.msu.edu/>

[5] H-Option report form: <http://www.reg.msu.edu/Forms/AAForms/AAMenu.asp>

Section 5: Example Honors Options

This section contains a sample of Honors Option projects that have been pursued in various courses in Lyman Briggs College, and is meant to give instructors ideas about possible projects in their own courses. Please note that this sample is chosen to convey the range of possibilities, and not the limits of what is allowable!

LB 118 (Calculus I, instructor: Bell):

Note: All students meet with the instructor several times and submit additional homework on the topic of the epsilon-delta definitions of limits and continuity. Then each student completes an independent project such as one of the following:

1. Learn to write simple procedural computer programs using C or Python. Implement the bisection method and Newton's method for root finding. Do some analysis of how many iterations are required for the desired precision. The final project is a paper and a working computer program.
2. Solve and give a mathematical analysis of a mathematical puzzle game (e.g. the fifteen puzzle consisting of 15 squares which slide orthogonally on a 4 x 4 grid and such that one square is empty, chessboard problems, tiling problems). Final project is a paper or poster.

LB 119 (Calculus II, instructor: Bell):

Note: All students meet with the instructor several times and submit additional homework on the topic of the definition of the logarithm as an integral and on the topic of proving the equivalence of several standard definitions of Euler's number. Then each student completes an independent project such as one of the following:

1. Learn to write simple procedural computer programs using C or Python. Implement the midpoint, trapezoid, and Simpson's rules for numerical integration. Do some analysis of how many iterations are required for the desired precision. The final project is a paper and a working computer program.
2. As in LB 118 above, select a different topic outside the scope of calculus. The goal is to write a short expository mathematical paper which includes some original exercises (and solutions, of course) written by the student. Past topics have included game theory applied to sports competitions, Fermat's little theorem and the Diffie-Hellman public key system, mathematical and computer aided analysis of blackjack, and an introduction to Fourier series.

LB 144 (Biology I, Organismal Biology, instructor: Cheruvelil)

All across campus, various departments and organizations host seminar series and special seminars on a wide range of topics. Your assignment is to attend 10 science-related seminars this semester and write a 1-2 page summary and analysis of each seminar's content. A list of seminars is provided on Angel. [Note: detailed instructions available from Kendra.]

LB 145 (Biology II, Cell & Molecular Biology, instructor: Smith):

A recurring honors option that I run is molecular modeling (<https://www.msu.edu/course/lb/145/smith/s14/honors.html>). Students meet with me on Friday afternoons at 3 pm for one hour to build models of the molecules that we are studying in class. At the end of the term, I have each student write a paragraph describing what they did to earn their "H".

LB 171/172 (Chemistry I and II, instructors: LaDuca, Sweeder):

1. Outreach chemical demonstration exhibitions at local elementary schools, for the MSU Science Festival, or for Chemistry Day at Impression 5 Science Museum. This generally requires preparation ahead of time, and (depending on the instructor) may require writing a short reflection on the demonstrations that the student did and their impression of the event.
2. 10 page paper outlining the historical/scientific/political impact of Nobel Prize winning work in chemistry, or a 10 page paper on some chemistry problem or topic (in materials science, geology, or basically any chemistry-related subject). Depending on the instructor, this may also include a poster or oral presentation during the LBC Research Symposium in April. All materials must be understandable by students in LB 171/2.
3. Developing a new laboratory procedure for LB 171L or LB 172L and writing a full laboratory report on it. Other lab-related H-options include refining existing experiences and writing blog posts to accompany the lab.
4. Doing a 3-week stint (6 hours per week) in LaDuca's research laboratory preparing and characterizing new coordination polymer solids (often remaking and analyzing samples from students who had graduated).
5. Finding animations and/or other online resources that are useful for learning chemistry concepts. A student pursuing this option has to write a brief (1-3 paragraph) description justifying the strengths and weaknesses of each resource. These resources will be made available to other students in the course prior to exams.
6. Creating a webcast to help students better understand core chemistry concepts by walking them through existing online chemical simulations and focusing attention on key aspects of the animation. This requires meeting with Prof. Sweeder regularly to ensure that the product developed will be of high quality, as it will be used in later semesters of the course.

LB 220 (Calculus III, instructor: Bell):

Note: The number of students indicating an interest in an honor option is usually quite small, so there are no general requirements. Rather each student does an independent project under my supervision. Here are some past projects:

1. Solve additional problems from the textbook on space curves and curvature. Then, working through a series of challenging exercises, give a mathematical derivation of Kepler's laws from Newton's 2nd law and Newton's law of gravitation. Final project is a poster.
2. Solve additional problems from the textbook on Lagrange multipliers. Then, give a mathematical derivation of Snell's Law from Fermat's principle and also give a mathematical proof of the arithmetic mean - geometric mean inequality. Final project is a poster.

Some particularly exceptional Honors Options from LB-220:

1. A student who studied Fourier series in LB 119 continued to learn about Fourier series and wrote an expository paper with some original content on Cesaro convergence of infinite series.
2. A student started a mathematical analysis of rock - paper - scissors - lizard - Spock, a 5 option variant of rock - paper -scissors. The student investigated the question of whether there is a unique 5 option variant up to the correct notion of equivalence. (More precisely, is there a unique 5 person regular tournament up to isomorphism?) Interesting combinatorial problems arose from this analysis.
3. A student investigated Schwartz's example of a sequence of polygonal surfaces in 3-space which converge point-wise to a right circular cylinder of height and radius equal to 1; the sequence of areas of these surfaces, however, diverge. He is currently working on writing up a paper summarizing his findings from last semester as well as writing up calculations concerning a generalization of Schwartz's construction.

LB 273/4 (Physics I and II, instructor: O'Shea):

Common Honors Options in the intro physics courses include the following:

1. Read a book and/or a set of articles relating to physics or astronomy in some way that have a central theme, and write a paper synthesizing what you have read. Examples of themes include global climate change, biographies of famous physicists such as Newton, Einstein, or Oppenheimer; the development of quantum mechanics; the development of the atomic bomb; and the history and current developments in manned space flight. This is an individual project, and would culminate in a 10-15 page paper (plus bibliography) and either a presentation or poster at the LBC research symposium.

2. Produce a ~10 minute long “MythBusters” video confirming or “busting” a physics-related myth, similar to the TV show of the same name. This is typically a group project, and culminates in the video (shown in class during the final week of the semester) and a short writeup explaining what was done and how the effort was broken up.
3. Produce a ~10 minute long video on applications of physics in biology and/or medicine. Recent examples have focused on medical imaging using MRI, NMR, and ultrasound, and also laser eye surgery. This is generally done in a small group, and culminates in a video and short writeup.
4. Develop a simulation using the Python programming language and visualized in VPython that illustrates a particular physical concept. This is an individual project, and culminates in a demonstration of the software and a short writeup.
5. Write a case study focusing on a particular physics experiment or facility, such as Fermilab or the Large Hadron Collider. What are the arguments for and against such a facility? What economic and social benefits does it provide? This is an individual project, and culminates in a 10-15 page paper (plus bibliography).
6. Write a paper comparing a journal article on a particular science topic to the popular press explanation(s) of the research that was done. Critique how the science was portrayed by the press to the public, and what sorts of quotes were taken from the scientists who were interviewed. This is an individual project, and culminates in a 10-15 page paper (plus bibliography).
7. Pick two or more of the labs that were done in LB 273 or 274 over the course of the semester, and improve them in a substantial way. This may involve updating the lab writeup so that it is more informative or useful, changing the way that the lab itself is performed, coming up with ways to tie the labs to other disciplines in Lyman Briggs, and so on. This would best be done by a group of 2-3 students and would culminate in a short (3-5 page) lab manual and a 10-15 minute presentation in class at the end of the semester.

LB3XX (instructor: Wake):

(Note: this is the Honors Option requirement that is uniformly applied across all of her 300- and 400-level HPS courses.) The honors option for LB300+ requires that you identify, locate, and read 6-7 articles or book chapters relevant to one of the issues or themes that we cover in class. Then, you will have to either write a research paper of 8~9 pages or, if there are 2 or more students working on the same issue or theme, create a poster in collaboration. In the process of researching, reading, and writing, you will have to meet with me at least 2 times to discuss your findings, and if you are working with other students, meet with them as well in order to create a coherent, well-designed poster. In either case, your submission must be accompanied by a formal bibliography.

LB3XX and 492 (instructor: Waddell):

I typically ask students to design their own H-Options. Some of the most successful have involved students giving presentations in class, which allows them to explore topics that we haven't covered -- I've done this in LB 492 (senior seminar) a few times. I have also had some students research a topic and write a short paper on it, and have received some excellent work that way as well.

LB 331 (Literature and Science, instructor: Dilshani):

The student submitted a brief research proposal for a project that explores the intersection of neuroscience, cognitive psychology, and arts and humanities. She then conducted a review of relevant neuroscience and social science literature to examine the correlations between art and human brain functions/human behavior, and developed an annotated bibliography and submitted it to the instructor. Finally, she presented her research findings in class (as a formal presentation), followed by a class discussion (30 mins total).

HST 201, LB 333, LB 492 (Various HPS-related courses, instructor: Bellon. Last two include Jim Smith as a second instructor.)

[The student] wrote and illustrated a children's book (aimed at grades K-2) that addresses the potential issues of human genetic engineering. The book had a dual message: that we must think about the use of technology in the future and that we should be proud of our diversity in the present. The language was appropriate for a young audience and the concepts clear without being simplified to the point of inaccuracy. The illustrations were charming and dovetailed nicely the text. Supplementary text for adults helped to put the book into context for parents, teachers and other caregivers who might be reading it to or picking it for children.

[The student] is writing a young-adult adventure novel (on his own and not as an academic exercise) about a group of teenagers dealing with the appearance of extraterrestrial life. He wrote a chapter where the characters discuss issues of science and religion -- ones that we addressed in class -- as they attempt to make sense of their situation. This was an engaging attempt to translate some relatively heavy philosophical and theological issues into an accessible language and to show how they are relevant to everyday concerns (even if in this case the backdrop was fantastical).

Written by the student: For my honors option I created a website to allow other visitors to experience what I was able to experience on my trip to England. The website added an extra dimension to my study abroad by allowing me to learn more about each of the places that I visited and allowed me to reflect on each place and determine my favorite part. The research that I did in creating the website and looking into each place that I visited allowed me to learn more of the background to each place allowing me to appreciate what I saw.

For her 'H' option in this Study Abroad program course, [the student] created a mixed-media art portfolio influenced by themes from the program`s core novel, Frankenstein, as well as cultural experiences gained while abroad in the UK. She created a progressive series that started before the program departed and has continued to present. Media include acrylic paintings, photography, linocut printing, watercolours, and sketching. To date, the collection consists of 4 photographs, 3 acrylic paintings, 2 water colors, plus pages in a workbook of ideas yet to be realized. We are hoping to find some exhibit space in Holmes Hall for this collection.