The gender gap in physics: The under representation of women in science, technology, engineering, and math (STEM) fields in the United States is a troubling issue that represents the underlying flaws in current STEM education such as hidden sexism. This problem is very pronounced in physics, 42% of high school physics students are women, but women make up only 20.3 % of physics bachelors degrees in the United States.

Sense of Belonging: A sense of belonging can be defined as “the extent to which individuals feel like a valued, accepted, and legitimate member in their academic domain”. This is a psychological sense of how well students feel that they belong in an specific academic community. This thesis explores sense of belonging to determine how sense of belonging differs between male and female students as well as academic year in undergraduate physics courses at Ithaca College. Women in STEM face, stereotypes, microaggressions, sexism, and in some cases a curriculum and culture that is tailored towards traditional male qualities. Women in physics courses are experiencing a sense of exclusion from the field, a feeling that they are not wanted because they do not fit the typical physicist role. Or in other words, they have a low sense of belonging in physics courses. A higher sense of belonging in STEM has been reported to be linked to self-efficacy, higher achievement, a decrease in anxiety about performing STEM activities, a greater interest in STEM, and higher persistence. A higher sense of belonging is even linked to positive health effects, like combating depression and anxiety. Increasing a sense of belonging in physics courses may be an instrumental part in bridging the gender gap. Feeling comfortable in the field can go a long way in encouraging persistence, which can be extremely helpful in increasing the number of women who achieve physics bachelors. If a sense of belonging could be improved at an undergraduate level, it is likely that it can be done at a high school level and thus increase the persistence of high school students. Over time this could potentially lead to a reduction in the gender gap in physics.

The data gathered by this thesis is organized by gender and academic year to help determine how the difference in sense of belonging between male and female students changes throughout their undergraduate experience. This thesis measures the sense of belonging of students at each level of the undergraduate program at Ithaca College using an adapted version of the sense of belonging instrument (SOBI), the adaptation was done to tailor the instrument to become a sense of belonging in STEM instrument. This adaptation
is more relevant to the physics students used in this thesis than the original instrument. The participants for this study include first to senior year Ithaca College physics undergraduate students. During the Spring 2018 Semester each physics student will receive the SOBI survey via their university email.

Results: At this time not all of the surveys needed to begin data analysis have been completed by the physics students so as of now there are no results for this thesis. The hypothesized results for this thesis in respect to gender is that the female students will report a lower sense of belonging than the male students. In respect to academic year, the expected result is that sense of belonging will increase with academic year.