

Sustainable Development Goal Curriculum Modules For Engineering First-Year Seminars



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Introduction

- The College of Engineering is working to transition to include concepts of “humanities.”
- The college would like to incorporate concepts of sustainability and ethics into their curriculum to help give students a holistic academic experience.

Background

- The Pennsylvania State University requires that new students take a first-year seminar and has partnered with Project Drawdown to have Drawdown Scholars write curriculum for the College of Engineering that incorporate “Drawdown Solutions” from the book *Drawdown* and “Sustainable Development Goals (SDGs).”
- The United Nations released a list of 17 “Sustainable Development Goals” in 2015 that outline global goals that will be a guide for United Nations Development Programme’s policy and funding until 2030.

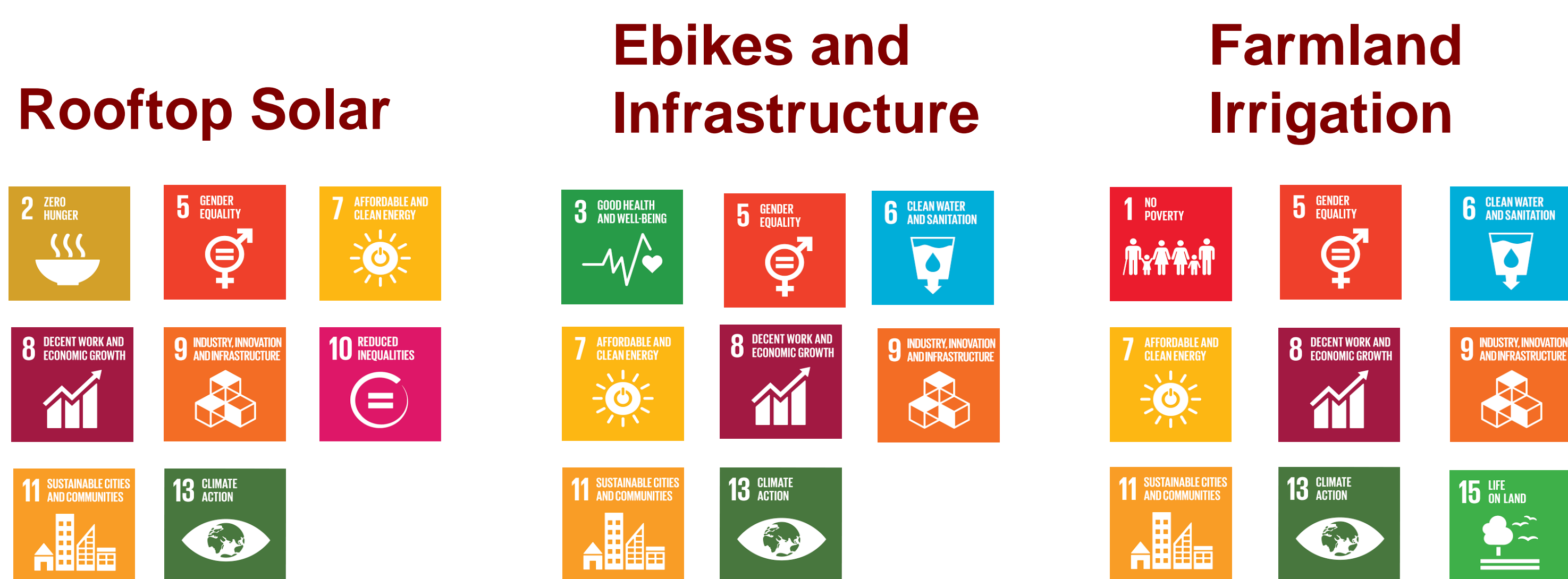


Figure 1. Drawdown solutions with relevant Sustainable Development Goals

Methods

- Topics of the modules were based on Drawdown solutions and were more broadly related to SDGs. Topics include SDG’s, Rooftop Solar, Ebikes and Infrastructure, and Farmland Irrigation.
- Each module topic breaks down into two or three lessons.
- Lessons begin with Drawdown material, and branch out and provide students with information from, but are not exclusive to the EPA, the USDA, the UN, National Geographic, etc.
- Content was based off a combination of sources inspired by faculty and student input and foundational learning outcomes.

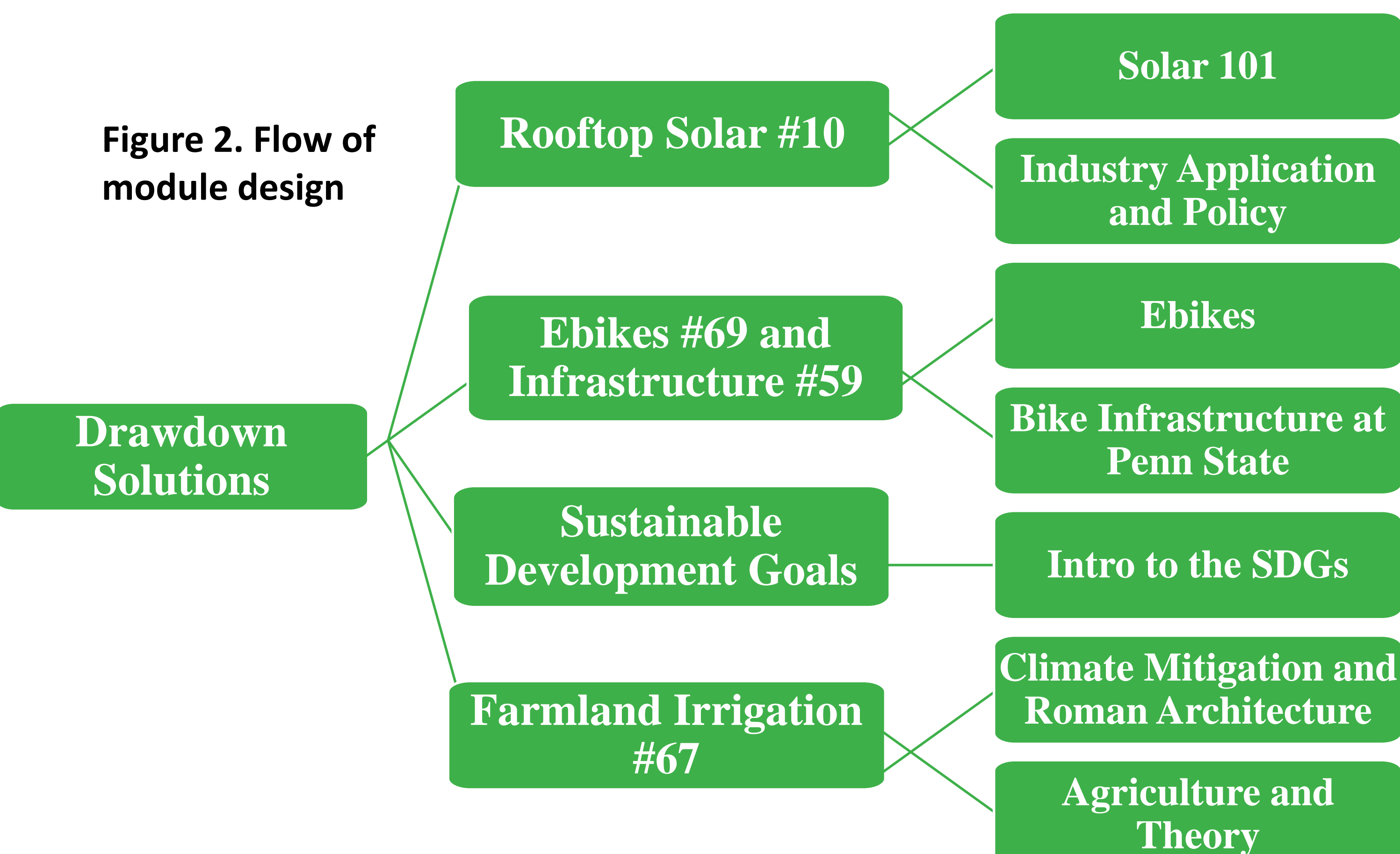


Figure 2. Flow of module design

Obstacles

- I integrated concepts of sustainability into the materials and tailored them to students with different perspectives and backgrounds. Diversifying the concepts and lessons came as a challenge because not all students may be familiar or open to sustainability.
- I am not an engineering student, so I worked with students and professors at Penn State to gain perspective as to what it’s like to be a student taking courses in this program and school.

Deliverables

- The deliverables that have been created are worksheets, factsheets, readings compiled to created lessons and modules.
- Each lesson starts with a reading from the Drawdown book, and moves on to supporting articles, videos, and/or podcasts to prepare students for the lesson.
- Deliverables are intended to be used in First-Year Seminars but can be adapted to be used in other college or secondary education classes.

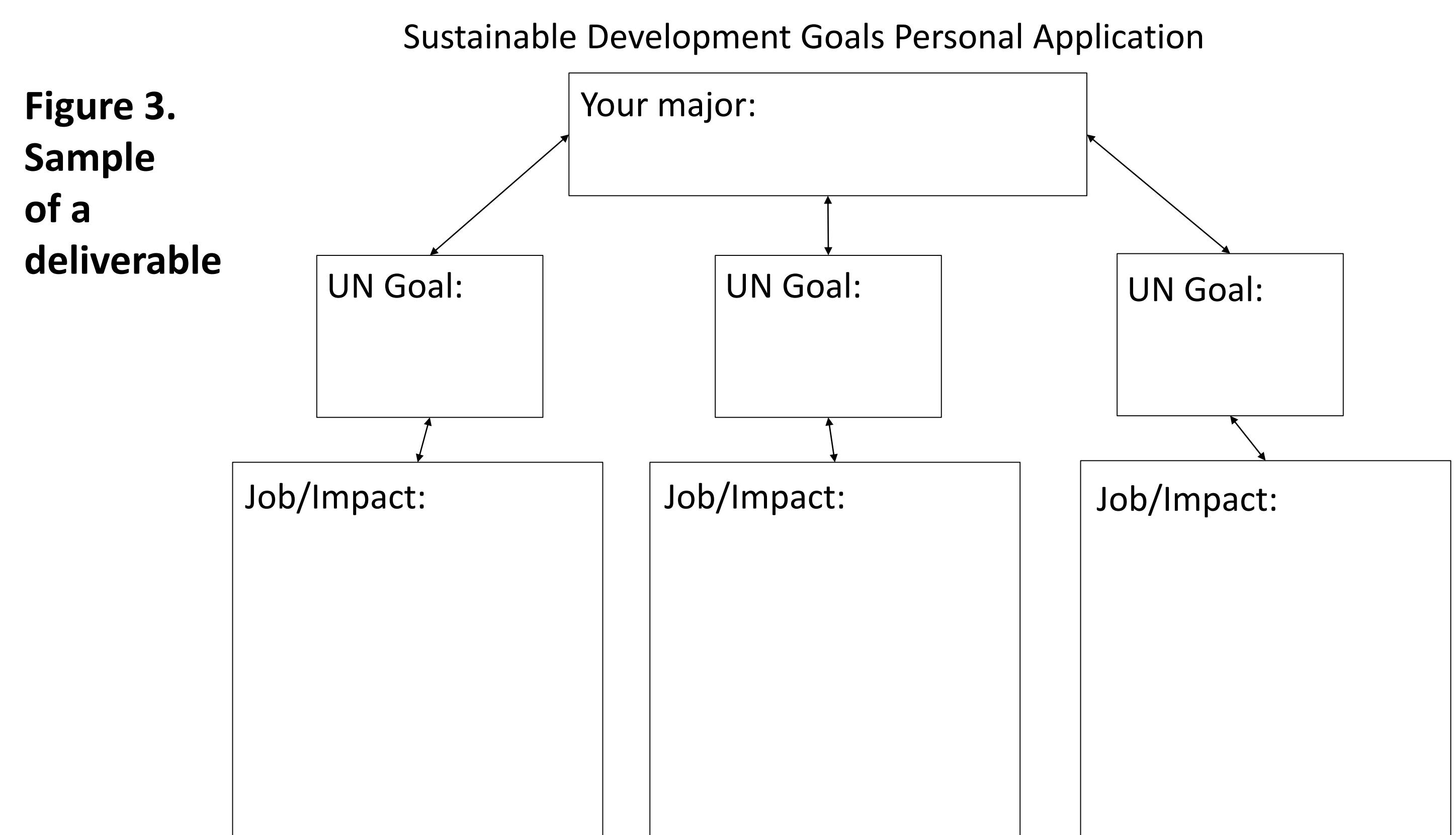


Figure 3. Sample of a deliverable

Conclusion

- Deliverables have been made available for professors at Pennsylvania State University to use starting the 2019-2020 school year.
- Use of these curricula will provide students a holistic experience that includes engineering, sustainability, and human rights concepts.

Moving Forward

- The developed curriculum will be put in a knowledge commons that will be accessible by professionals at other universities.
- The National Council of Science and the Environment has partnered with Project Drawdown to continue developing the curriculum produced through the program and adapt it to other courses.

References

- Hawken, P. (Ed.). (2017). *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming*. New York, New York: Penguin Books.
- Sustainable Development Goals. (n.d.). Retrieved July 01, 2019, from UNDP website: <https://www.undp.org/content/undp/en/home/sustainable-development-goals.html>