

Teaching Polymer Sustainability at the Undergraduate Level

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Introduction

- The Plastics industry has suffered from sustainability challenges for a long time
- Students entering the industry need to understand the issues and best-practices associated with improving the sustainability of the plastics industry
- PES 320: Polymer Sustainability is designed to impart this knowledge to students
- The EOP framework was used to improve course content and discussions on additional aspects of sustainability

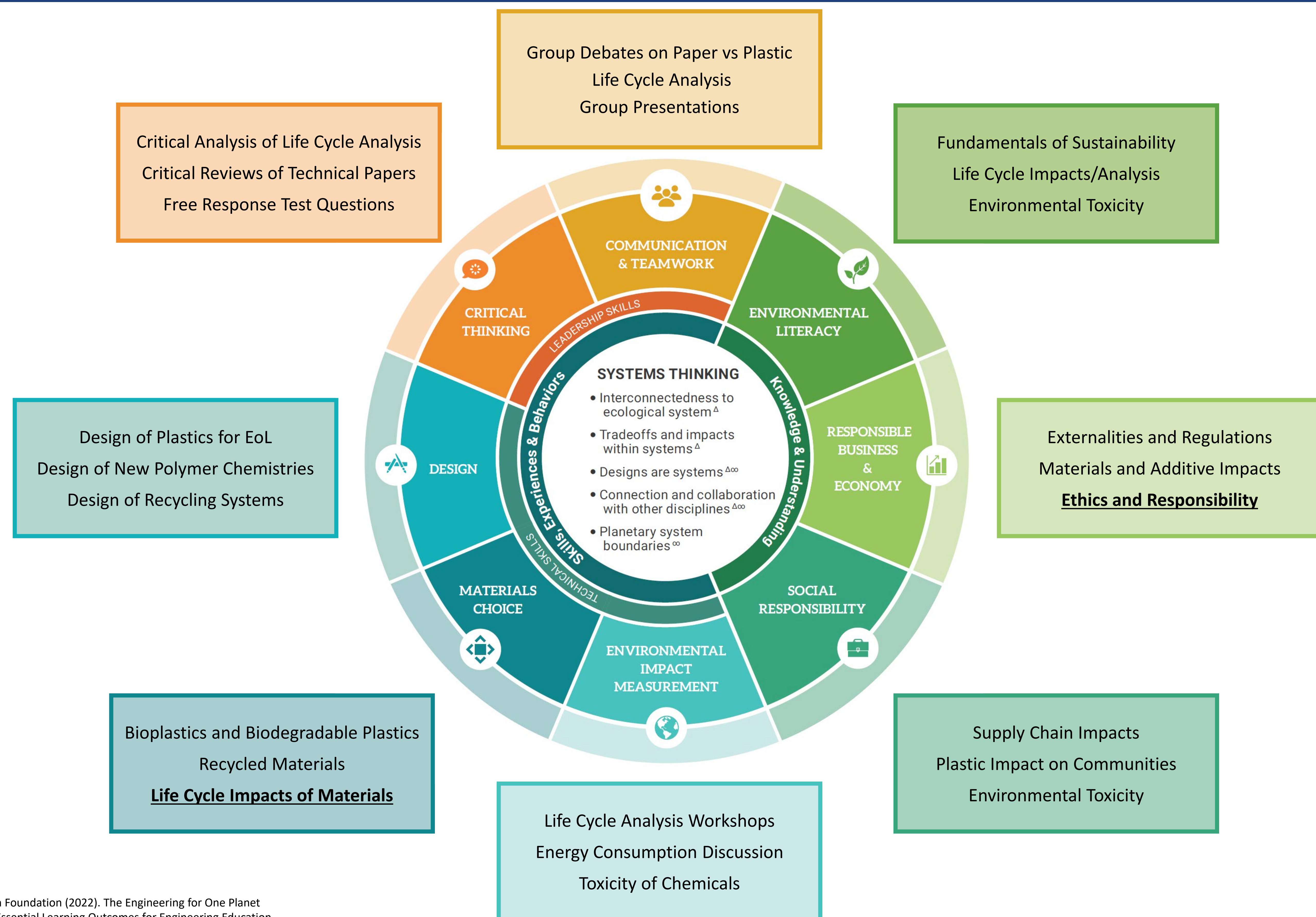
Course Outline

- Fundamentals of Sustainability
- Economics and Supply Chains
- Plastic Life Cycles
- Life Cycle Analysis
- Polymer Degradation and Risk
- Biobased, Biodegradable, and Circular Plastics
- Plastic End-of-life technologies
- Regulations

Procedure

- Mapped learning objectives, activities, and assessments to each class
- Identify opportunities for hands-on-interaction
- Team life cycle analysis debate
- Inclusion of engineering ethics/responsible business decisions
- Beach plastic cleanup trip, microplastics discussion

Progress: EOP Framework Mapping



Progress and Plan for Scaleup

- Identified additional topics for discussion
 - Supply chain impacts on minorities, low-income communities, other countries
- Hand-on functional unit example
 - Peanut butter and jelly sandwich
- Discussion of the obligation of the engineer and responsibility for plastics engineers
- Next steps:
 - Pre/post class survey on sustainability
 - Discord office hours
 - Youtube outreach

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