Title: —and provides a solid foundation in the theory and practice of forensic analysis of marine debris.

Key Learning Outcomes:

- Develop proficiency in identifying polymers using spectroscopic and thermal techniques.
- Explore gas chromatography and mass spectroscopy (GC/MS and pyrolysis-GC/MS) to detect and qualitatively analyze plastic additives.
- Experience a four-step method for analyzing complex, multilayer plastic composites in three dimensions.
- Understand marine debris's sources, composition, and environmental implications, and gain experience in real-world sampling and analysis.
- Strengthen problem-solving skills to support recycling initiatives, product redesign, and sustainable material management.

Sample Course Activities & Topics

Activity Type	Sample Topics & Exercises	Learning Objectives
Foundational Learning	- Introduction to marine plastic pollution -	

Additive Analysis & Advanced Instrumentation	- Solvent extraction methods for additive detection - GC/MS preparation and qualitative analysis - Py-GC/MS for additive detection and polymer refinement	Enhance skills in identifying and characterizing additives within polymers, gaining familiarity with a range of analytical techniques
Summative Discussion	- Group discussions on data interpretation - Student discussion of sample findings - Q&A sessions to consolidate learning and share insights	Reflect on results, practice scientific communication, and engage with peers to refine analytical reasoning and draw informed conclusions.