



UNIVERSIDADE FEDERAL DE SÃO CARLOS  
PRÓ – REITORIA DE PÓS-GRADUAÇÃO

COURSE DESCRIPTION SHEET



1. Course Name: **Microplastics: Nature, Occurrence and Environmental Impact**
2. Course Code: 221
3. Semester offered: 2<sup>nd</sup>
4. Total course credits: 4
5. Course workload
  - 5.1. Lecture classes: 30h
  - 5.2. Practical classes:
  - 5.3. Seminars: 30h
6. Course Syllabus:
  - Introduction: History of plastic and microplastic pollution; Definitions of primary and secondary microplastics; Origin and distribution of microplastics.
  - Polymer Science behind microplastics: Diffusion theories; Physical properties (glass transition, melting and crystallization); Additives; Polymer degradation.
  - Toxicity: Potential causes of toxicity; Intentionally Added Substances (IAS) and Non-Intentionally Added Substances (NIAS); Sorption and desorption; Mechanical toxicity; Tissue diffusion (micro vs nanoplastics); Homogeneous distribution or accumulation.
  - Monitoring: Collection; Separation (Simple vs complex systems); Characterization and Identification; False positives and False negatives.
  - Regulatory policy: National plans and regulatory policies; Case discussion; Intergovernmental initiatives.
7. Main Bibliography:
  - Due to being an emerging contaminant, there is no consolidated textbook available. The course will be based on scientific literature.