

Name of Programme: M. Sc. Applied Geology

Course Code: GEO-611

Title of the Course: Microplastics Pollution

No of Credits: 02

Effective from AY: 2023-24

Prerequisites for the course:	Students should have undergone M.Sc. Semester III.	
Course objectives	This course introduces the students to the concept of microplastics as a pollutant and its impact on the environment.	
Content:	<p>Module 1</p> <p>Introduction to Microplastics and its distribution</p> <p>Introduction to Plastics and microplastics: Types of plastics: PET, HDPE, PVC, LDPE, PP and PS. Microplastics types: fibres, microbeads, fragments, nurdles, foam. Primary and Secondary, microplastics and its formation. Biotic degradation, Abiotic degradation: Photo-oxidative degradation, atmospheric oxidation and hydrolytic degradation</p> <p>Global occurrence and sources of microplastics. Distribution and fate of plastic in the environment: microplastics pollution in terrestrial environment, freshwater and marine waters, snow and atmosphere.</p> <p>Sampling and characterization: Methods used for sampling, quantification of microplastics. Instrument for identification of microplastics- FTIR and Raman Spectroscopy.</p> <p>Module 2</p> <p>Impacts of Microplastics</p> <p>Potential impacts on the environment and human health. Microplastics as vectors for chemical pollutants in the soil and water. Metal and metalloid contaminated microplastics.</p> <p>Assessment and Mitigation: Risk assessment studies and mitigation methods for microplastics pollution.</p> <p>Case studies: Microplastics pollution studies in India- Case studies.</p>	<p>15 hours</p> <p>15 hours</p>
Pedagogy:	Lectures, case studies, discussions and assignments.	

References/ Readings:	<ol style="list-style-type: none"> 1. Crawford, B.C & Quinn, B. (2016). <i>Microplastic Pollutants</i> (1st ed.). Elsevier Science. 2. Rocha-Santos, T., Costa, M. & Mouneyrac, C., (Eds.). (2022). <i>Handbook of Microplastics in the Environment</i> (1st ed.). Springer. 3. Rocha-Santos, T.A.P. & Duarte, A.C. (Eds.). (2017). <i>Characterization and Analysis of Microplastics</i> (1st ed.). Elsevier Science.
Course Outcomes:	<ol style="list-style-type: none"> 1. Students will be able to identify and classify microplastics. 2. Students will be able to understand the effects of microplastics on humans and environment. 3. Students can come up with need based mitigation methods. 4. Students will be able to propagate the adverse effects of microplastic.