

Syllabus 2021/2022

Teacher (name and affiliation)	Luca Zoia (DISAT), Ruggero Barni (DFO) and Carmen Canevali (SdM), University of Milano-Bicocca, Milan, Italy Antonello Cerullo, Jerome Vachon, Massimo Benocci, SABIC, Milan, Italy
Title	New lignin-based sustainable materials: science and technological aspects.
Language	<i>English</i>
CFU	<i>1</i>
Hours	<i>8</i>
Program	<p>Lignin is the second most abundant organic macromolecule in nature. Its extraction tends to increase worldwide, demanding new applications for an efficient lignin use. This course gives an overview on the whole lignin life cycle, from biosynthesis to industrial applications.</p> <p>In particular, the following subjects will be developed:</p> <ul style="list-style-type: none"> -Chemistry of lignocellulosic materials -Lignin biosynthesis, chemical structures and reactivity -Lignin extraction processes (kraft, alkaline, organosolv) -Main techniques in Lignin characterization (FT-IR, GPC, 31P-NMR, 13C-NMR, 2D-HSQC, EPR, SEM, ICP-AES) -Plasma technology for lignin modification: plasma treatment aimed to surface functionalization for lignin-based composites -Sustainability initiative in SABIC: certified polymers (bio-renewable and circular polymers) and bio-based polymers (PE-starch blends and PE-lignin blends).
Evaluation: YES/NO	YES – oral colloquium
Calendar	<i>I or II semester</i>