UNIVERSITÀ DI PISA

SUSTAINABLE AND DEGRADABLE POLYMERS

PATRIZIA CINELLI

Academic year	2019/20
Course	MATERIALS AND NANOTECHNOLOGY
Code	739II
Credits	6

Modules	Area	Type	Hours	Teacher(s)
SUSTAINABLE AND DEGRADABLE POLYMERS	ING-IND/22	LEZIONI	48	PATRIZIA CINELLI

Obiettivi di apprendimento

Conoscenze
Knowledge on definition of biobased polymers, definition of biodegradation and compost ability. Normatives on biobased and biodegradation of polymers. Standards for composting, and soil degradability. Biobased and biodegradable polymers, production, characteristics, properties, processing, applications, end of life.
Setting a biodegradation test, Life Cycle Assessment.
Principles of Circular economy and bio economy.
Main biodegradable and biobased polymers; Polylactic acid, polyhydroxyalkanoates, polybutylene adipate-co-terephthalate, polybutylene succonate, polycaprolactone, starch, cellulose, proteins.
Thermal properties of polyesters, differential scanning calorimetry studies, glass transisiont temperature, cristallinity, amorphous and rigid amosphous fractions.
Biocomposites with natural fibres.

Modalità di verifica delle conoscenze
Brief report on a selected material. Oral discussion and exam with the professor.
Preparzione di una relazione, discussione e verifica orale.

Capacità
Acquire knowledge on correct definition and proper standard on biobased and biodegradable polymers. Concepts of circular economy and sustainability.

Modalità di verifica delle capacità
Critical discussion of properties of biobased and biodegradable materials. Being able to handle the tuning of properties and select the proper polymer for the proper targeted application, considering production, processing, use and end of life options.

Prerequisiti (conoscenze iniziali)

Conoscenze di base sui polimeri, produzione, proprietà fisiche, termiche, morfologiche.

Bibliografia e materiale didattico

Slides del corso, articoli e reviews forniti dal docente.

Indicazioni per non frequentanti
Leggere le slides e chiedere materiale integrativo al corso (reviews rese disponibili dal docente)

Modalità d'esame
Breve relazione ed esame orale

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