

SYLLABUS – L-30

General information	
Year of the course	II year
Academic calendar (starting and ending date)	October -december
Credits (CFU/ETCS):	10
SSD	CHIM/06 and CHIM/05
Language	Italian
Mode of attendance	In presence No obligatory frequency

Professor/ Lecturer	
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Department and address	Chemistry via Orabona 4 Bari 70125
Virtual room	Teams by appointment
Office Hours (and modalities: e.g., by appointment, on line, etc.)	Tuesday and Friday by appointment via email

Work schedule			
Hours			
Total	Lectures	Hands-on (laboratory, workshops, workinggroups, seminars, field trips)	Out-of-class study hours/ Self-study hours
87	72	15	250
CFU/ETCS			
10	9	1	10

Learning Objectives	Acquire basic knowledge of organic chemistry and organic polymeric materials, with particular reference to the chemical processes for their obtaining, the relationships between structure and chemical-physical and mechanical properties, and on the main applications of the various classes of polymeric materials
Course prerequisites	General and Inorganic Chemistry. Basic principles of thermodynamics. Basic knowledge of mathematics.

Teaching strategie	
Expected learning outcomes in terms of	Frontal teaching with exercises (38%) consisting in carrying out assigned exercises and problems in the classroom that require the application of the concepts developed in the theoretical lessons and short seminars held by students on assigned topics for in-depth analysis of the most relevant topics covered in the course theoretical. The teaching course is not delivered in e-learning mode.

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<p>Knowledge and understanding on:</p>	<ul style="list-style-type: none"> o o Knowledge of the structure of organic compounds and their stereochemistry o o Knowledge of the main classes of compounds o o Knowledge of the main reaction mechanisms o o application of the main synthesis methods o o Knowledge of the molecular structure of polymers and polymerization processes. o o Knowledge of the properties of polymeric materials in the solid state and in solution. o - o Basic knowledge on the mechanical properties of polymers. o Dublin Descriptor 1: <ul style="list-style-type: none"> o • Making judgments o At the end of the course the student should be able to o o Identify the structure of a polymeric material starting from that of the monomer/s and through which polymerization process it can be produced. o o Rationalize the chemical-physical properties of the polymeric material on the basis of its molecular structure. o o Identify, on the basis of the evaluation of the mechanical properties, the suitability of a polymeric material for a specific use. o o - Dublin 2 Descriptor: <ul style="list-style-type: none"> o Communication skills o At the end of the course the student should be able to o o dialogue with the appropriate terminology in use in the scientific community with specialist and non-specialist interlocutors on aspects of a chemical nature relating to polymeric materials. o • Ability to learn independently o At the end of the course the student should be able to o o continue autonomously, with the basic knowledge gained in this course, more in-depth studies and face possible interviews and selections for positions in the chemical industry - Dublin 3-5 Descriptor: <ul style="list-style-type: none"> o The student must be able to interact with skills in economics and engineering
<p>Applying knowledge and understanding on:</p>	<ul style="list-style-type: none"> o The fundamental principles of organic chemistry, with particular reference to the classes of compounds addressed on the basis of functional groups and carbon hybridization, mechanisms of addition, elimination and aromatic and aliphatic substitution, list of the main natural substances, polymer synthesis methods, classification of polymers based on their chemical structure and properties
<p>Soft skills</p>	

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	<ul style="list-style-type: none"> ○ • Knowledge and understanding: ○ ○ Minimum level for passing the exam: Knowledge of the main classes of synthetic polymers, their nomenclature and their structure and the monomers from which they derive. ○ ○ Intermediate level: Knowledge of the mechanisms of polymerization processes and of the kinetic and thermodynamic aspects. Knowledge of the properties of polymers in various states of aggregation. ○ ○ Higher level: Detailed knowledge of polymerization processes also aimed at the synthesis of polymers with specific characteristics (eg block copolymers, graft copolymers, living polymerizations) ○ or ○ • Applied knowledge and understanding: ○ ○ Minimum level for passing the exam: Being able to identify the structure of a polymer starting from the monomer/s and the type of the same. ○ ○ Intermediate level: Being able to describe the polymerization process(es) for obtaining a specific polymeric structure. ○ ○ Higher level: Describe in detail, with kinetic and thermodynamic implications, a polymerization process. ○ ○ • Making judgments: ○ (This result can only be achieved if the intermediate and upper levels of the previous two points are achieved). ○ ○ Evaluate the possible applications on the basis of the knowledge on the chemical-physical and mechanical properties acquired during the main classes of polymers.learning ○ XXXXXXXXXX.
Syllabus	
Content knowledge	
Texts and readings	<p>Introduction to organic chemistry-solomons, brown, whatever organic chemistry test is available to students Handouts and slides On the teams class generated every year</p>
Notes, additional materials	
Repository	

Assessment	
Assessment methods	<p>1) (half-course and at the end) consisting of two written tests with questions in mixed modality (both multiple choice questions and open-ended questions) with a maximum of 10 questions (for each of which a maximum score is indicated in attributable thirtieths) with two hours of time available. Each question will be evaluated up to the maximum score foreseen, taking into account the criteria listed below and the tests are considered passed if a minimum total score of 18/30 is achieved. The tests will take place in presence. The student has the right to accept the grade resulting from the average of the grades of the two tests as a final assessment for the polymer technology module. If the student aspires to a higher mark, she will have to take a partial exam</p> <p>2) Partial test in the form of interview fixed on ESSE3 on a monthly basis by the teacher and in accordance with the exam calendar. For those who have not participated in the tests in progress or have not passed them, or have not accepted the result, the partial test is the means for the overall verification of</p>

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	learning
Assessment criteria	<ul style="list-style-type: none"> • • Knowledge and understanding: <ul style="list-style-type: none"> o Minimum level for passing the exam: Knowledge of the main classes of synthetic polymers, their nomenclature and their structure and the monomers from which they derive. o Intermediate level: Knowledge of the mechanisms of polymerization processes and of the kinetic and thermodynamic aspects. Knowledge of the properties of polymers in various states of aggregation. o Higher level: Detailed knowledge of polymerization processes also aimed at the synthesis of polymers with specific characteristics (eg block copolymers, graft copolymers, living polymerizations) • or • • Applied knowledge and understanding: <ul style="list-style-type: none"> o Minimum level for passing the exam: Being able to identify the structure of a polymer starting from the monomer/s and the type of the same. o Intermediate level: Being able to describe the polymerization process(es) for obtaining a specific polymeric structure. o Higher level: Describe in detail, with kinetic and thermodynamic implications, a polymerization process. • • • Making judgments: <ul style="list-style-type: none"> (This result can only be achieved if the intermediate and upper levels of the previous two points are achieved). o Evaluate the possible applications on the basis of the knowledge on the chemical-physical and mechanical properties acquired during the main classes of polymers. • • • Communication skills: <ul style="list-style-type: none"> o For all levels: demonstrate knowledge of the correct scientific terminology, relating to the knowledge required for the three levels, and explain the topics of the exam questions with proper language. • • • Ability to learn: <ul style="list-style-type: none"> o In carrying out the exam, the proposed topics will have an increasing degree of depth in order to establish at which level of knowledge, fundamental, intermediate and superior, the student's learning ability has reached.
Final exam and grading criteria	<p>The final grade is unique and includes the assessments relating to the two modules into which the course is divided. This mark consists of the weighted average for the credits of each module of the marks reported by the student. For the polymer technology module the final grade will consist of:</p> <p>a) average of the results of the two ongoing tests if accepted by the student</p> <p>b) grade obtained in the partial test referred to in point 2 of the learning assessment procedures in the event that the ongoing tests have not been taken, passed or accepted by the student</p>
Further information	
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<p>Criteria di valutazione</p>	<ul style="list-style-type: none"> • Conoscenza e capacità di comprensione: <ul style="list-style-type: none"> ○ <u>Livello minimo per il superamento dell'esame</u>: Conoscenza delle principali classi di polimeri sintetici, della loro nomenclatura e della loro struttura e dei monomeri da cui essi derivano. ○ <u>Livello intermedio</u>: Conoscenza dei meccanismi dei processi di polimerizzazione e degli aspetti cinetici e termodinamici. Conoscenza delle proprietà dei polimeri ai vari stati di aggregazione. ○ <u>Livello superiore</u>: Conoscenza dettagliata dei processi di polimerizzazione anche finalizzati alla sintesi di polimeri con specifiche caratteristiche (eg copolimeri a blocchi, copolimeri graft, polimerizzazioni viventi) ○ • Conoscenza e capacità di comprensione applicate: <ul style="list-style-type: none"> ○ <u>Livello minimo per il superamento dell'esame</u>: Essere in grado di individuare la struttura di un polimero a partire dal/i monomero/monomeri e la tipologia dello stesso. ○ <u>Livello intermedio</u>: Essere in grado di descrivere il/i processo/i di polimerizzazione per l'ottenimento di una specifica struttura polimerica. ○ <u>Livello superiore</u>: Descrivere in dettaglio, con le implicazioni cinetiche e termodinamiche, un processo di polimerizzazione. • Autonomia di giudizio: (Questo risultato può essere conseguito solo se vengono raggiunti i livelli intermedio e superiore dei precedenti due punti). <ul style="list-style-type: none"> ○ Valutare, sulla base delle conoscenze sulle proprietà chimico fisiche e meccaniche acquisite nel corso delle principali classi di polimeri, le possibili applicazioni. • Abilità comunicative: <ul style="list-style-type: none"> ○ Per tutti i livelli: dimostrare la conoscenza della corretta terminologia scientifica, relativa alle conoscenze richieste per i tre livelli, ed esporre con proprietà di linguaggio gli argomenti delle domande di esame. • Capacità di apprendere: Nello svolgimento dell'esame, gli argomenti proposti avranno un grado di approfondimento crescente al fine di stabilire a quale livello di conoscenze, fondamentale, intermedio e superiore, sia pervenuta la capacità di apprendimento dello studente.
<p>Criteria di misurazione dell'apprendimento e di attribuzione del voto finale</p>	<p>Il voto finale è unico e comprende le valutazioni relative ai due moduli in cui il corso è suddiviso. Tale voto è costituito dalla media pesata per i crediti di ciascun modulo delle votazioni riportate dallo studente. Per il modulo di tecnologia dei polimeri il voto finale sarà costituito da:</p> <ol style="list-style-type: none"> a) media dei risultati delle due prove in itinere se accettata dallo studente b) votazione conseguita nella prova parziale di cui al punto 2 delle modalità di verifica dell'apprendimento nel caso in cui le prove in itinere non siano state sostenute, superate o accettate dallo studente

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	elevata lo/la studente/studentessa deve avere sviluppato autonomia di giudizio e adeguata capacità di argomentazione ed esposizione. Infine, è possibile indicare i criteri per l'assegnazione della Lode.
Altro	
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