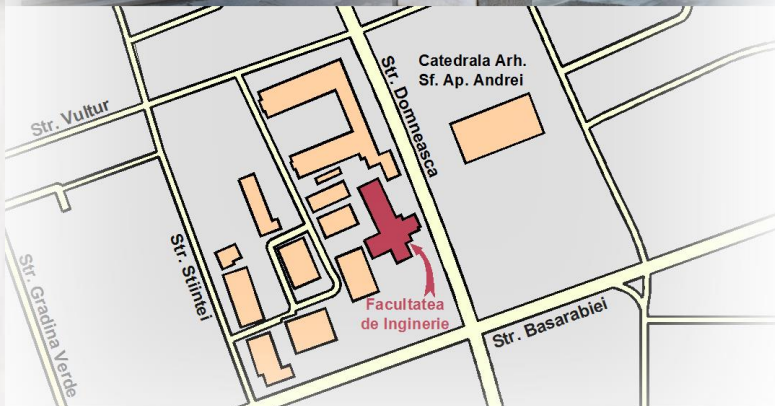


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Summer School

Polymers vs. Composites: Basics, Mechanical Properties, Rheology and Processing

Invited speakers

Prof. Marc J.M. Abadie
Acad. Bogdan C. Simionescu
Prof. Constanta Ibanescu
Eng. Marius Lungu

11-14 September 2018

Room B32

Galați, Romania



**“Petru Poni” Institute of Macromolecular
Chemistry**

Academy of Technical Sciences of Romania



SYLLABUS

Course Objectives

- The purpose of this course is to introduce to the students the principal definitions of organic polymers and composites, their respective properties, rheology and processing as well;
- It also provides some fundamental knowledge of different new materials developed and their application in the design and the use for automotive, marine and aircraft manufacturing.;
- Ultimately the course should offer to the students the ability to engineer properties combining the design of the composites to fulfill the properties of the materials required v.z.-Nature of fibres & matrices - Orientation and fibres architecture -Arrangement of folds -Laminate & lamina stackings.

On completion of this course, the students should be able to:

- understand the main difference between thermoplastics, thermosets and elastomers;
- understand basic definition, properties and difference between polymers and composites;
- understand important relationships between structure and properties of polymers and composites;
- understand the advantages and limitations of both type of materials;
- have a better understanding and approach of polymer and composite processing.

COURSE DETAILS

Challenges in Polymer Science

Polymer Basics

Composite Basics

Polymer Processing

Composite Processing

Rheology

Applications: Automotive

Marine & Aircraft

18h Lectures

presented by

Acad. B.C. Simionescu

Prof. Marc J.M. Abadie

Prof. Costanta Ibanescu

Eng. Marius Lungu from Renault-Roumanie

Prof. Marc J.M. Abadie

Marc J.M. ABADIE is Emeritus Professor at the Université Montpellier 2, Sciences et Techniques du Languedoc. He was full professor at the Université Montpellier 2, Sciences et Techniques du Languedoc and head of Laboratory of Polymer Science and Advanced Organic Materials – LEMP/MAO. He is currently “Michael Fam” Visiting Professor at the School of Materials Science and Engineering, Nanyang Technological University, Singapore.



Bogdan C. Simionescu is the vice-president of Romanian Academy and head of the Laboratory of Polymeric Materials Physics of “Petru Poni” Institute of Macromolecular Chemistry of Romanian Academy, Iasi. He is a professor at “Gheorghe Ascahi” University of Iasi.



Costanta Ibanescu is a professor at “Gheorghe Ascahi” University of Iasi and a Senior Researcher at “Petru Poni” Institute of Macromolecular Chemistry.



PROGRAMME

Tuesday, 11 September 2018

- 9⁰⁰ – 9³⁰** **Opening Address**
Acad. Bogdan C. Simionescu & Prof. Cătălin Fetecău
- 9³⁰ – 11⁰⁰** **Challenges in Polymer Science**
Acad. B.C. Simionescu
- 11⁰⁰ – 11³⁰** **Coffee & Tea Break**
- 11³⁰ – 13⁰⁰** **Polymer Basics 1.**
Classification, Synthesis, Polymers @ Solid State
Prof. Marc J.M. Abadie
- 13⁰⁰ – 14³⁰** **Lunch Break**
- 14³⁰ – 16⁰⁰** **Polymer Basics 2.**
Thermal Analysis, Molar masses, Molar distribution
Prof. Marc J.M. Abadie
- 16⁰⁰ – 17⁰⁰** **Presentations of Graduate Master & PhD Students thesis**
- 17³⁰ – 18³⁰** **Dinner**

Wednesday, 12 September 2018

- 9³⁰ – 11⁰⁰** **Composite Basics 1. Definition & Advantages of Composites, Prepregs & B-Stage Curing**
Prof. Marc J.M. Abadie
- 11⁰⁰ – 11³⁰** **Coffee & Tea Break**
- 11³⁰ – 13⁰⁰** **Composite Basics 2. Matrices, Reinforcing Agents**
Prof. Marc J.M. Abadie
- 13⁰⁰ – 14³⁰** **Lunch Break**
- 14³⁰ – 16⁰⁰** **Composite Basics 3. Interfaces/Interphases, Stacking & Laminates, Hybrid Metal Laminates, Calculus**
Prof. Marc J.M. Abadie
- 16⁰⁰ – 17⁰⁰** **Open discussion**
- 17³⁰ – 18³⁰** **Dinner**

Thursday, 13 September 2018

- 9³⁰ – 11⁰⁰** **Rheology 1.**
A Comprehensive Introduction to Rheology and Rheometry
Prof. Constanta Ibanescu
- 11⁰⁰ – 11³⁰** **Coffee Break**
- 11³⁰ – 13⁰⁰** **Rheology 2. Rheology in Applied Chemistry**
Prof. Constanta Ibanescu
- 13⁰⁰ – 14³⁰** **Lunch Break**
- 14³⁰ – 16⁰⁰** **Polymer Processing**
1. Thermoplastics: Thermoforming, Rotational Molding, Extrusion, Blow Molding, Injection Molding
2. Thermosets: Compression & Transfer Molding, RTM
Prof. Marc J.M. Abadie
- 16⁰⁰ – 17⁰⁰** **Open discussion**
- 17³⁰ – 18³⁰** **Dinner**

Friday, 14 September 2018

- 9³⁰ – 11⁰⁰** **Composite Processing**
1. Open Mold Process: Hand lay-up, Spray lay-up, Tape lay-up, SMC, Autoclave molding
2. Closed Mold Process: Compression molding, Injection molding, Transfer molding
3. Other: Pultrusion, Filament winding, Drilling
Prof. Marc J.M. Abadie
- 11⁰⁰ – 11³⁰** **Coffee Break**
- 11³⁰ – 13⁰⁰** **Application 1. Automotive**
1. Vehicle Architecture : upstream, development and industrialization in automotive
2. Vehicle Process engineering: domains and participation in projects
Eng. Marius Lungu from Renault-Roumanie
- 13⁰⁰ – 14³⁰** **Lunch Break**
- 14³⁰ – 16⁰⁰** **Application 2. Marine & Aircraft Manufacturing**
Prof. Marc J.M. Abadie
- 16⁰⁰ – 17⁰⁰** **Feedback from participants & Closing Address**
- 17³⁰ – 18³⁰** **Dinner**