

# **Rheology Course, Rouse and Reptation Models: Molecularly based models describing the dynamics of unentangled and entangled polymeric systems**

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## **COURSE DESCRIPTION**

Rouse and Reptation Models:

These molecularly based models have been proved successful in describing the dynamics of unentangled and entangled polymeric systems.

The course will cover:

Rouse Model:

- Relaxation Modes.
- Relaxation Modulus.
- Dynamic Moduli
- Terminal Region.
- Semidilute unentangled solutions.
- Temperature dependence of dynamics.

Reptation Model:

- Entanglements in polymer melts.
- Reptation in polymer melts.
- Relaxation times and diffusion.
- Stress relaxation and viscosity.
- Dynamic Moduli.
- Terminal Region.
- Plateau Modulus.
- Examples of constraint release: Double reptation

## César. A. García-Franco



Dr. Garcia-Franco obtained his D. Sc. Degree at Washington University - Saint Louis (USA) in May 1977. His thesis advisor was Professor Richard M. Christensen. Dr. Garcia-Franco worked for Shell Development Company, 3M Company and ExxonMobil Chemical Company where he retired in 2011 after 22 years of service. Dr. Garcia-Franco's work is considered fundamental in the detection and quantification of short and long chain branching with rheological techniques, as well as in the description of the effects of these molecular parameters on the dynamics of ethylene/ $\alpha$ -olefin copolymers synthesized by Metallocene and Ziegler-Natta technologies on different platforms (gas phase, solution, slurry etc.). Dr. Garcia-Franco has published 19 papers and is inventor or co-inventor of 37 US Patents. His h-index=12, and i10 index=15. Number of Citations=898. Dr. Garcia-Franco has been consultant to the following Companies: 1) ExxonMobil Chemical Company from June 2012 to March 2015. 2) Milliken Chemical Company (Spartanburg SC) from March 2014 to July 2015, and July 22 & 23 2013. 3) Braskem America (Pittsburgh Pa), October 24-26, 2015. 4) Centro de Investigación en Química Aplicada (Saltillo Coahuila), February 2015 to present.