FEDERAL UNIVERSITY OF CEARÁ
Provost Office of Research and Graduate Studies

COURSE PROGRAM

1. PROGRAM:	
Program	GRADUATE PROGRAM IN CHEMISTRY

2. COMPONENT TYPE:

Activity ( )	Course (X)	Module ( )

3. LEVEL:

Master´s Degree (X)	Doctorate (X)

4. COMPONENT IDENTIFICATION:

Name:	INTRODUCTION TO POLYMER CHEMISTRY
Code:	CEP7722
Hours:	64
Credits:	4
Optional course:	Yes (X) No ( )
Compulsory course:	Yes ( ) No (X)
Area:	There are no mandatory concentration areas for the discipline

5. PROFESSOR:

Profa. Judith Pessoa de A. Feitosa
Profa. Pablyana L. R. da Cunha
Profa. Regina Célia M. de Paula

6. ABSTRACT:

Polymer definitions, Structure classification, preparation method, behavior and mechanical performance. Type of configuration and conformation of polymer chains. Molar mass distribution in polymers. Main methods of determination of molar masses. Polymer applications.

7. COURSE PROGRAM:

1-Definitions
1.1 Polymer Concept
reactive functional groups
reactive double bonds
1.2 Functionality
1.3 Types of string
Linear,
branched,
with crosslinks.
1.4 Copolymers
Random,
Alternate,

in block,
Grafted.

2.0 Classification of polymers
2.1 Regarding the chemical structure
2.1.1 Carbon chain polymers
diene polymers
Styrenic polymers
Chlorinated polymers
Fluorinated polymers
acrylic polymers
polyvinyl esters
Poly(phenol-formaldehyde)
2.1.2 Heterogeneous Chain Polymers
Polyethers
Polyesters
Polycarbonates
Polyamides
Polyurethanes
Aminoplastics
Cellulose Derivatives
Silicones
2.2 Classification as to the method of preparation
2.2.1 Addition Polymers
2.2.1 Condensation Polymers

2.3 Classification regarding mechanical behavior
2.3.1- Plastics
Thermoplastics
thermoset
2.3.2 Elastomers

2.3.3 Fibers

2.4 Mechanical performance rating
2.4.1 Conventional thermoplastics
2.4.2 Special thermoplastics
2.4.3 Engineering thermoplastics (TE)
2.4.4 Special engineering thermoplastics

3- Configuration and Conformation of polymer chains
3.1 Configuration
3.1.1 Polymer chaining,
3.1.2 Cis/trans/vinyl isomers in dienes,
3.1.2 Tacticity

3.2 Conformation
3.2.1 Skein.
3.2.2 Random or curled,

3.2.3 Planar zigzag,
3.2.4 Helical,
3.2.5 Helix or Spiral

4- Molar Mass of Polymers
4.1 Types of molar masses
Average numerical molar mass (Mn)
Average molar mass 1 (Mw)
Average viscosimetric molar mass (Mv)
Molar mass Z - average (Mz)

4.2 Molar mass distribution curve

4.3 Main methods of determination of molar masses
End of chain analysis:
Colligative properties: Osmometry; Ebulliometrics; cryoscopy
Size Exclusion Chromatography (SEC, GPC)
light scattering
Viscosymetry
ultracentrifuge
5- Polymer Applications

8. EVALUATION PROCESS:

Theoretical evaluation and seminars.
Frequency equal to or greater than 75%

9. BIBLIOGRAPHY:

Free