

BIOPOLYMERS

1.1. Identification

University:	Kungl Tekniska Högskolan (KTH), Stockholm, Sweden											
School:	School of Chemical, Science and Technology											
Course:	Biopolymers											
ECTS:	7.5											
Semester:	<i>Winter</i>					<i>Summer</i>				X		
Category	<i>Fundamental course</i>						<i>Specialisation course</i>					X
Module	<i>MFI</i>		<i>MFII</i>		<i>MFIII</i>		<i>MSI</i>		<i>MSII</i>	X	<i>MSIII</i>	
Teachers:	Sigbritt Karlsson											
Language:	<i>English</i>		X	<i>Italian</i>		<i>Swedish</i>	X	<i>Spanish</i>				

1.2. Learning-outcomes

- knowledge in the structure, function and use of biopolymers.
- knowledge about the properties of biopolymers from their structure (atomic, nano-, micro- and macro)

1.3. Competencies

▪ General

- to have critical understanding of technical and scientific tools
- to work and manage teams
- communication skills (both written and oral)
- to work in an international context

▪ Specific

- To determine the suitable synthetic and biopolymers for environment adapted products
- To determine the suitable biopolymer for polymer application
- To analyse and evaluate cycle adaption of bio- and synthetic polymers

1.4. Contents

The structure, function, properties and use of biopolymers. Molecular architecture for some biological structures such as collagen, tissue, silk, wool, spider's thread, shell. Nature as a model for polymeric materials. Cycle- and environment adapted materials. Survey and introduction to biomedical materials and "drug delivery" formulations.

Biocomposites and biominerals. Biological attacks on polymeric materials and degradation mechanisms in polymeric materials. Degradation products in different environments. Environmental issues when using polymers. Recovery/reuse of plastics. Polymer characterization in environmental analysis

1.5. Teaching Methodology

- Lecture sessions
- Practical sessions: “cooperative work” for solving problems
- laboratory sessions

1.6. Evaluation

- written exams
- oral evaluation of the problems solved by “cooperative work”
- Passed exercise course
- Participation in education visit

1.7. Bibliography

- J. Vincent: Structural Biomaterials
- M. Elices: Structural Biological Materials
- Vetenskapliga artiklar