

Title:Soft Matter: mathematical aspects, physical modeling and Computer Simulation

Requirements for the course:

The course will be in English, and will be self-contained, that is: for mathematicians it is not required previous knowledge of physics and for physicists and chemists is required only a basic knowledge of mathematics.

Structure of the course:

- (2+2)+2: 1 lecture per week + 2 hours per week of lecture preparation (see below) +2 hours of practical (project) work
Practical work as **miniprojects**: *Analyse problems of current interest in soft matter and molecular modeling. Working as single or in group, each student will try to contribute with mathematical as well as physical ideas to a possible solution of the problem and write a brief report about her/his results.*
- Lectures are presented by the students with notes and material prepared by the lecturer. The students have support from the lecturer during the preparation and the discussion in class of his/her lecture.
- Explanations/clarifications/discussions during the lectures are led by the Lecturer.
- Every week one different students covers in class the material of one lecture.
- Final grade/assignment of credit points based on: Quality of the lecture + Quality of written report and class discussion for the (mini)project (Quality of lecture= clarity of exposure, asking the proper questions, initiate a constructive discussion)

Contents:

- **The physical idea of soft matter and its relevance for current science is first presented**
- **Various mathematical and physical models for calculations are introduced, for static and dynamics**
- **Computational approached that combine the mathematical and physical models are finally discussed**

Literature:

(1) Introduction to Polymer Physics by M. Doi

(2) Soft Matter Physics by M. Doi

Most of the material of lectures will be provided in forms of pdf by the lecturer

Given the current situation of emergency, time and presentation of the lecture and practical session can be discussed and agreed. Experimented options from last semester allow a certain flexibility that will students to work and learn in optimal conditions.

*Interested students can contact **Luigi Delle Site**: luigi.dellesite@fu-berlin.de*