# Statistical and Biological Physics

**Module No.: MN-P-SP-StatBio, MN-P-PN-StatBio, MN-P-WaMa** Version: 21.06.2017 BM

# Course: Statistical Physics of Soft Matter and Biomolecules

**Lecturers: G. Gompper**
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| Category | Type | Language | Teaching Hours | CP | Semester |
|---|---|---|---|---|---|
| Core Course | Lecture | English | 3+1 | 6 | WiSe |
| Core Course | Lecture + Seminar | English | 4+1 | 7.5 | WiSe |

**Requirements for participation:**
Advanced Statistical Mechanics

**Type of module examinations:**
Oral Examination

**Duration of the course:**
1 semester

**Aims of the course:**
Understanding the molecular structure and mesoscopic properties of various types of soft matter systems, in particular with regard to their role in living cells.

**Contents of the course:**

- Colloids, polymers and amphiphiles
- Biopolymers and proteins
- Membranes
- Physics of the cell

**Recommended literature:**

J. K. G. Dhont, An Introduction to Dynamics of Colloids (Elsevier, Amsterdam, 1996).
M. Doi and S. F. Edwards, The Theory of Polymer Dynamics (Clarendon Press, Oxford, 1986).
S. A. Safran, Statistical Thermodynamics of Surfaces, Interfaces, and Membranes (Addison-Wesley, Reading, MA, 1994).
G. Gompper, U. B. Kaupp, J. K. G. Dhont, D. Richter, and R. G. Winkler, eds., Physics meets Biology — From Soft Matter to Cell Biology, vol. 19 of *Matter and Materials* (FZ Jülich, Jülich, 2004).
D. H. Boal, Mechanics of the Cell (Cambridge University Press, Cambridge, 2002).