



MS431: Nano-Biomaterials (Edu 3.0)

🕒 Class Time

MTWTh 14:00 – 17:00

📍 Location

To be announced

📖 Credit

3

👤 Instructor

Professor Yoon Sung Nam ([yoonsung\(at\)kaist.ac.kr](mailto:yoonsung@kaist.ac.kr))

Office : Applied Engineering B/D, W1-1, Rm 5404 ; Hours: MW 14:00 – 15:00

Phone : 042-350-3311

📚 Required Materials

Course Summary

★ Description

This class introduces the physical principles involved in biomolecular interactions and self-assembly of biomolecules into functional nanostructures.

★ Course Outline

1. Understanding Biological Molecules
 - o Water – physical and chemical properties
 - o Nucleic acids
 - o Peptides and proteins
2. DNA Nanotechnology
 - o DNA structures
 - o DNA origami
 - o DNA nanofabrications
 - o Applications
3. Biomolecular Interactions
 - o Mathematical description of ligand-protein interactions
 - o Understanding binding curves
 - o Multivalent binding and cooperativity – hemoglobin vs. myoglobin
 - o Antibody-antigen interactions
 - o Surface plasmon resonance (SPR) analysis

Course Evaluation

Grading

The weighting distribution will be:

- o Problem sets: 40%
- o Mid-term examination: 30%
- o Final examination: 30%