

Nano-/Bio-materials

Fall 2020

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Office Hours: By appointment
Lecture: W5W6W7

Course Goals: This course will provide students with an introduction to nanomaterials and biomaterials used in different kinds of applications. We will survey important classes of nanomaterials (e.g., carbon-based nanomaterials and quantum dots) and biomaterials (e.g., naturally-derived biomaterials and polymeric biomaterials), discussing materials preparation, processing, properties and applications. We will also offer at least two experimental sections about the preparation of paper diagnostic devices and the cell culture.

Textbook: N/A; class notes/journal papers/magazine articles

Grade:

Report (assignment & experiment) (5) 30%; 500 words (in English)

Exam 30%

Final Report & Presentation 40%; 1000 words (in English)

Tentative Schedule:

Week 1 (9/16): Introduction to nano-bio-materials

Week 2 (9/23): Experimental (bacteria culture, assistant) [Report]

Week 3 (9/30): Introduction to nano-bio-materials [Report]

Week 4 (10/7): Introduction to biomaterials

Week 5 (10/14): Naturally-derived biomaterials

Week 6 (10/21): Naturally-derived biomaterials [Report]

Week 7 (10/28): Experimental (detection device, assistant) [Report]

Week 8 (11/4): Polymeric biomaterials (e.g., PE/PDMS) [Report]

Week 9 (11/18): Application – Tissue Engineering

Week 10 (11/25): Application – Chemical-/Biological-sensing

Week 11 (12/2): Midterm

Week 12 (12/9): bench work

Week 13 (12/16): bench work

Week 14 (12/23): bench work

Week 15 (12/30): bench work

Week 16 (1/6): Project presentation – 6 persons [Report]