

**Introduction to Nanomedicine:
Basic Concepts and Applications (3 Credits)**
纳米医药入门：基本概念与应用



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Synopsis	This course consists of two parts. The first half covers basic concepts in nanotechnology and tools for fabricating nanostructured and bioengineered materials: quantum dots, DNA, self-assembly, and functionalization. The second half discusses applications of nanotechnology in biomedical research (i.e., diagnostics, imaging, and targeted drug delivery), and discusses the translation of laboratory discoveries to therapies applicable in clinical trials.
Offering	2014 Summer Semester
Audience	Undergraduates (all levels)
Classroom	Room xxx, Teaching Bldg. No. XX, Peking University
Schedule	<u>Class</u> : 1-4 PM, M-F, July 7–25, 2014; <u>Final Exam</u> : 1-4 PM, July 26, 2014

- Objectives**
1. Appreciate the relevance of nanotechnology and bioengineered materials to our daily lives and modern biomedical applications;
 2. Understand the underpinning theories and tools for fabricating practical biomedical devices based on nanotechnology;
 3. Interpret data from and formulate hypothesis based on research in nanomedicine, and offer objective critiques to the scientific literature.

- References**
1. C.M. Niemeyer and C.A. Mirkin, *Nanobiotechnology: Concepts, Applications and Perspectives*, Wiley, 2004.
 2. E. Papazoglou, *Bionanotechnology*, Morgan and Claypool, 2007.
 3. Other review articles and reference readings will be distributed in class.

Syllabus	<u>Part 1: Introduction</u>	<u>Part 2: Bionanomaterials</u>
	“Nano” as a bio-relevant length scale	Fabrication
	Commercial “bio-nano” healthcare products	Characterization
	<u>Part 3: Key Applications in Medicine</u>	<u>Part 4: Clinical Translation</u>
	Diagnostics	Milestones of the translation process
	Imaging	Case studies
	Targeted drug delivery	

Grading	Homework	20%
	Midterm Exam	30%
	Final Exam	50%
	Total	100%