Dept. of Bio and Brain Engineering
Korea Advanced Institute of Science and Technology (KAIST)

**HSS 189** **Fall 2012**

Prof. Je-Kyun Park
Room 1119, E16 Building
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Room 220, E16 Building
Wed 15:00-16:00
http://nanobio.kaist.ac.kr

# HSS 189 Freshman Seminar 2 (새내기 세미나2)

## Synopsis
This course provides an introduction to the basic integrative bioengineering for undergraduate students. By introducing recent research areas in bioengineering to freshman upon entrance to college, this course helps them choose their specific majors. This course also covers the most up-to-date application of nanotechnology to the life sciences.

## Credit
1 units (1:0:1)

## Recommended Prerequisite
None.

## Grading
Attendance (10%) and Participation (90%). The class participation grade will be based on student participation in seminar discussion, preparation for class, and completion of assigned readings and other assignments.

## Office Hours
Wed 14:00 - 15:00

## Teaching Assistants
Dongsik Han (han.dongsik@kaist.ac.kr, Tel: 4355, Room 802, E16);
Young Lee (youngleekaist@kaist.ac.kr)

## Textbook
List of references and reading materials will be presented at class.

## References
1. George Acquaah (2004). Understanding Biotechnology: An Integrated and Cyber-Based Approach, Pearson Prentice Hall, ISBN: 0130945005
2. Ratner,M. Ratener,D. (2003) Nanotechnology A Gentle Introduction to the Next Big Idea, Prentice Hall, ISBN: 0131014005
3. National Research Council (2009), A New Biology for the 21st Century, The National Academies Press, Washington, D.C., ISBN-13: 978-0-309-14486-5 (PDF)

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Fall 2012

Lecture Schedule

| Week | Topics | Contents | Chapter |
|---|---|---|---|
| 1 | *I. Introduction* | Course Outline | |
| 2 | *2. Enabling Technologies of Bioengineering* | Biological Problems | |
| 3 | | Human Health and Diagnostics | |
| 4 | | Nanoparticles, Nanowires, and Nanotubes | |
| 5 | | MEMS and NEMS | |
| 6 | | Microfluidics and μTAS | |
| 7 | | Biomimetic Systems | |
| 8 | *Midterm Exam. Period* | | |
| 9 | *3. Application Areas* | Biomaterial Issues | |
| 10 | | Nanobiosensors | |
| 11 | | Nanomedicine | |
| 12 | | Lab-on-a-chip | |
| 13 | | Micro- and Nanotechnology for Cell Biology | |
| 14 | *4. Student Presentation* | Oral Presentation # 1 | |
| 15 | | Oral Presentation # 2 | |
| 16 | *Final Exam. Period* | | |