Syllabus for Spring 2020, Institute of Biopharmaceutical Sciences

Course title：**Introduction to Micro/Nanobiotechnology in Disease Diagnosis and Therapy**

Course descriptions： This course is designed for Graduate Students who are interested in micro/nanotechnology for biomedical applications. An introduction to nanomaterials, micro/nanofabrication technology and microfluidics will be given first, followed with a series of important applications in biochip design, disease diagnosis, drug delivery, cell-based therapy and exosome therapy. Students are expected to learn the fundamentals and technology related to micro-/nano-bioengineering. Each student is required to carry out an independent literature review leading to a term paper on a selected topic.

Date：	Location:	Contact: Dr. L. James Lee,
March 5th, March 6nd March 7th, March 13th, March 14th, March 20th and March 21st	1st Fl BPS Classroom, Biomedical Building	Room 210 at 7355

Date	Topic	Hour	Instructor
03/05 17:30-20:00	Introduction to Micro/Nanotechnology Micro/Nanomachining	2.5	Dr. L. James Lee
03/06 12:30-15:00	Micro/Nanomolding and Soft Lithography	2.5	Dr. L. James Lee
03/07 12:30-15:00	Surface Functionalization	2.5	Dr. L. James Lee
03/13 12:30-15:00	Microfluidics for Disease Di agnosis	2.5	Dr. L. James Lee
03/14 12:30-15:00	Soft Materials for Drug Delivery	2.5	Dr. L. James Lee
03/20,21 12:30-15:30	Nanotechnology for Liquid Biopsy and Gene Delivery	5.0	Dr. L. James Lee
TBA in April	Final Exam	1.0	Dr. L. James Lee
TBA in April	Final Report due		Dr. L. James Lee

References as listed below.

Evaluation: Close book final and final report

PARTIAL LIST OF REFERENCES

Books

"Nanotechnology: Basic Science and Emerging Technologies", by Mick Wilson, Kamali Kannangara, Geoff Smith, Michelle Simmons and Burkhard Raguse, CRC Press (2002).

"Nanochemistry : A Chemical Approach to Nanomaterials" by Geoffrey A. Ozin and André C. Arsenault**,** RSC Publishing (2005).

"Fundamentals of Microfabrication", 2nd Edition by Marc J. Madou, CRC Press (2002).

Book Chapters

"Polymeric Nanostructures for Controlled Drug and Gene Delivery" by Jingjiao Guan, Hongyen He, Bo Yu and L. James Lee in Biomedical Nanostructures, Edited by K.E. Gonsalves, C.T. Laurencin, C. Halberstadt and L.S. Nair, John Wiley & Sons, Inc., to be published in (2007).

"Nanoscale Polymer Fabrication for Biomedical Applications" by L. James Lee in Volume "Biomedical and Biological Nanotechnology" in the Kluwer Series of BioMEMS and Biomedical Nanotechnology, Edited by Mauro Ferrari, Ch. 3, pp 51-96 (2006).