

Syllabus of Fall Semester, 2021

Course Title	게놈시대의생명공학과인간		Course Code	ZF12143	Section	001		
Department	Molecular Biology		Level	All	Credit - Theory - Practice	3.0 - 3.0 - 0.0		
Class Hours & Classroom	Mon. 12:00(75) 411-402, Wed. 12:00(75) 411-402							
Lecturer	LIM,WOON-KI	Office	Central Laboratory (# 312) Room # 610	Office Hours	월화수목 12:00~17:00			
		Telephone		E-mail				
Methodology of Instruction	online Teacher-centered learning, ETC(Teaching by Prof by using PPT and Youtubes. Group Activity such as Havruta and Problem solving)							
Evaluation and Grading	(1) Mid and final term exams, each 35%; class attendance 10% (-1% for each absence); workshop, 10%; class activity and participation 10% (2) One % extra point will be credited for each questioning activity during classtime with 5% maximum. * Students with disabilities can request an extension of the exam hour, and they can take exams by getting writing assistance or by using a computer.							
Prerequisites	None. No basic scientific knowledge required. This course is intended for all and any students with various backgrounds.							
Course Objectives	The completion of human genome could dramatically change the way of life, for example, cheap and quick analysis of each individual genome and customized medicine based on it. Simultaneously, the advancement of various sciences and engineering fields accelerate their application to development of biengineering/biotechnology, that could also affect our life so immensely. This class is to provide the past, present and future of biengineering/biotechnologies and genomic life sciences. It is intended to help students prepare for ~100 year lasting life in near future.							
Course Description	(1) This class will introduce a brief history regarding human genome research. The key concepts and explanation of genes, DNA and basic Molecular Biology required to understand genome will be explained. The aspect of accomplishment of human genome allowing new approaches to studying and understanding life will be included. Biotech industry pursuing personal genome and customized medicine will be added. Various aspects of bioengineering field will be introduced. This covers bionics, biomaterials, biomechanics, bioinstrumentation, biosensors, biosignal/image processing, biotechnology, tissue engineering, genome engineering, metabolic engineering, new forms of lives, etc. Ethical and social issues are also dealt with. During the course of class, in each relevant section, the basics of sciences and the cutting-edge technologies that are advancing and significantly contributing to our knowledge will be presented to help understand our topics. (2) All lectures will be presented by using ppts and Youtube, and websites. All lecture materials are accessible from Plato or/and the google sites (https://sites.google.com/site/limbioeng/.). (3) Various questions including the previous mid/final exam will be distributed for the sake of better understanding and preparation for the exam. * Students with disabilities can negotiate with the Disabled Student' s Academic Support Center regarding course materials and assignments.							
Relationship between Courses and Core Competencies								
8 Core Competencies of PNU	Global- Cultural Competency	Communication Competency	Convergence Competency	Application Competency	Community Service Competency	Human Character Competency	Foundation Knowledge Competency	High-order Thinking Competency
			0	0			0	
Textbooks and References								
Required Textbooks	\$1,000 genome by Kevin Davies (2010) isbn 978-89-966122-0-9 03400 (Its korean version , \$1000 게놈, 우정훈, 박재환, 금창원 옮김, 2011) (purchasing is not mandatory).							
References	1.내생명의 설계도 DNA (2013) 최재천외 30명, 과학동아북스 2. Postgenomics : Perspective on Biology after the genome. S.S. Richardson and H. Stevens, 2015 Duke Univ Press Books ISBN-13 978_0822358947							

3. The Personalized Medicine Revolution: How diagnosing and treating diseases are about to change forever. P. Cullis, Greystone Books, 2015, ISBN-13 978-1771640381
 4. The Cure in the code: How 20th century law is undermining 21st century medicine, P.W. Huber, 2013, Baic Books, ISBN-13 978-0465050680
 Additionally, list of many useful web sites and resouces will be informed during the class.

Weekly Schedule of Classes

Week No.	Course Material	Assignments and Other Notes
Week 1	[Orientation and Education on Academic Misbehavior (e.g. Cheating, Plagiarism) and Safety Education on Experiment and Practice] Overview and Historical Perspective	power point material and youtubes 1
Week 2	Fundamentals of Genomes	power point material and youtubes 2
Week 3	Functions of Genome in Life	power point material and youtubes 3
Week 4	Characteristics of Human Genome Choosuk holiday	power point material and youtubes 4
Week 5	15 Years after 1st Human Genome	power point material and youtubes 5
Week 6	Peronalized Medicine	power point material and youtubes 6
Week 7	Genome Engineering and Its Social/ Ethical Issues	power point material and youtubes 8
Week 8	Mid-term Exam	
Week 9	Biomaterials	power point material and youtubes 9/10
Week10	Biomechanics and Biosensors	power point material and youtubes 11
Week11	Biomedical signal/image and Biomedical instrumentation (Telemedicine, Wearable and Implantable Technologies)	power point material and youtubes 12
Week12	Genetic Engineering	power point material and youtubes 13
Week13	Tissue and Organ Engineering	power point material and youtubes 14
Week14	Stem Cells Work shop	power point material and youtubes 15
Week15	Organisam Cloning and Their Ethics	power point material and youtubes 15
Week16	Final exam	
Attachment		