광주과학기술원

개설SYLLABUS

대학분류 : GIST대학 년도 : 2019 학기 : 1학기 교과목번호 : BS3201

Classification	GIST College	Course No.	BS3201-01	Hrs:E:Credits	3/0/3	Instructor	Park, Daeho	Lecture Language	English
Course Title	Korea	미생물학							
	English	Microbiology							
Course Outline	Generally, microbe is defined as a unicellular organism, but, broadly, it contains some of eukaryotes including protist and fungi, prokaryotes, and viruses. Actually, even though microbes are very small and we can see the microbe only by microscopy, the microbe affects living habitat greatly. In this microbiology course, our focus is a studying of microbes characteristics and classifications. And then, we will study about the direct and indirect effect of microorganism on living organism and living habitat.								
Prerequisite	AND GS2302 (분자생물학),								
Textbook & References	Microbiology: An Introduction, Books a la Carte Edition (10th Edition) By Gerard J. Tortora , Berdell R. Funke , Christine L. Case								
Etcetera									

Weekly Course Schedule

Week	Description	*Remarks
1st	Microbiology & The Origin of Life	
2nd	Bacterial Diversity; Cell Structure (Structure and Function of Prokaryotes)	
3rd	Chemistry of Life (Cell Structure and Organization)	
4th	Physiology & Genetics (Diversity of Prokaryotic Metabolism)	
5th	Microbial Growth (Growth of Bacterial Populations)	
6th	Microbial Growth (Nutrition and Growth of Bacteria)	
7th	Control of Microbial Growth & Antimicrobials	
8th	Midterm Exam	
9th	Microbial Ecology	
10th	Epidemiology	
11th	Normal Flora (The Bacterial Flora of Humans)	
12th	Pathogenesis (Machanisms of Bacterial Pathogenecity)	
13th	Pathogenic Microbiology	
14th	Virology	
15th	Microbial Infection and Immunity	
16th	Final Exam	

*If there will be experiments, mark it in the "Remarks" section.

Instructor (seal)

Lecture Language

광주과학기술원

개설SYLLABUS

대학분류 : GIST대학 년도 : 2019 학기 : 1학기 교과목번호 : BS3204

Classification	GIST College	Course No.	BS3204-01	Hrs:E:Credits	3/0/3	Instructor	Lee, Gwangrog	Lecture Language	English
Course Title	Korea	생물물리 화학 입문							
	English	Introduction to Biophysical Chemistry							
Course Outline	The goal of this course is to understand the biophysical properties and principles of biological processes. This course will cover thermodynamics, Chemical Equilibrium, Enzyme Kinetics, Molecular Interactions, Spectroscopy (Three laws of thermodynamics, Phase, Equilibrium, Exidation /reduction, Kinetics and Enzyme, Atomic Structure, Chemical Bonds and Protein Interaction, Electron Transition and optical spectroscopy). The students are expect to understand the biological processes of life science at the level of atoms and molecules. The prerequisite of this class is general chemistry, general biology, biochemistry or its equivalent.							
Prerequisite	OR BS3113 (생화학 I), OR GS2302 (분자생물학),							
Textbook & References	Biophysical Chemistry (by James P. Allen) 2008 Wiley-Blackwell							
Etcetera								

Weekly Course Schedule

Week	Description	*Remarks
1st	Biophysical Chemistry (by James P. Allen) 2008 Wiley-Blackwell	
2nd	First and Second Law of Thermodynamics	
3rd	Phase, Equlibria and Reactions	
4th	Kinetics and Enzymes	
5th	Statistical Thermodynamics	
6th	Infrared Spectroscopy	
7th	Mid-term Exam.	
8th	Atomic Structure	
9th	Chemical Bonds and Protein Interactions	
10th	Electronic Transtions and Optical Spectroscopy	
11th	Single molecule Enzymology	
12th	Fluorescence Technology	
13th	Signal Transduction	
14th	Membrane Potentials, Transporters, and Channels	
15th	Molecular Imaging	
16th	Final Exam.	

*If there will be experiments, mark it in the "Remarks" section.

Instructor (seal)

Lecture Language

광주과학기술원

개설SYLLABUS

대학분류 : GIST대학 년도 : 2019 학기 : 1학기 교과목번호 : BS4201

Classification	GIST College	Course No.	BS4201-01	Hrs:E:Credits	3/0/3	Instructor		Lecture Language	English
Course Title	Korea	발생생물학							
	English	Developmental Biology							
Course Outline	This course aims to integrate organismal, cellular, genetic and molecular aspects of animal development, with a focus on the underlying principles and molecular mechanisms involved in cellular differentiation, morphogenesis and growth. Topics include oogenesis, spermatogenesis, fertilization, embryonic cleavage, gastrulation, early development of model vertebrates and invertebrates, patterning, organogenesis and stem cells.								
Prerequisite									
Textbook & References	Developmental Biology, 11th Edition by Scott F. Gilbert (recommended, but not required to purchase)								
Etcetera									

Weekly Course Schedule

Week	Description	*Remarks
1st	Ch. 1. Making New Bodies; Ch. 2. Specifying Identity	Sukwon Jin
2nd	Ch. 4. Cell to Cell Communication	Sukwon Jin
3rd	Ch. 3. Differnetial Gene Expression; Ch. 5. Stem Cells	Sukwon Jin
4th	Ch. 7. Fertilization	Sukwon Jin
5th	Ch. 8. Rapid Specification in Snails and Nematodes	Woo Jin Park
6th	Ch. 9. The Genetics of Axis Specification in Drosophila	Woo Jin Park
7th	Midterm Exam	Sukwon Jin
8th	Ch. 11. Amphibians and fish: Early development and axis formation	Woo Jin Park
9th	Ch. 11. Amphibians and fish: Early development and axis formation	Woo Jin Park
10th	Ch. 12. Birds and Mammals	Sukwon Jin
11th	Ch. 13. Neural Tube Formation and Patterning; Ch. 15. Neural Crest Cells and Axonal Specificity	Mi-Ryoung Song/ Sukwon Jin
12th	Ch. 16. Ectodermal Placodes and the Epidermis; Ch. 17. Paraxial Mesoderm	Sukwon Jin
13th	Ch. 18. Intermediate and Lateral Plate Mesoderm; Ch. 19. Development of the Tetrapod Limb	Sukwon Jin
14th	Ch. 20. The Endoderm; Ch. 22. Regeneration	Sukwon Jin
15th	Final Exam	Sukwon Jin
16th	-	-

*If there will be experiments, mark it in the "Remarks" section.

Instructor (seal)

Lecture Language

광주과학기술원

개설SYLLABUS

대학분류 : GIST대학 년도 : 2019 학기 : 1학기 교과목번호 : BS4207

Classification	GIST College	Course No.	BS4207-01	Hrs:E:Credits	3/0/3	Instructor	Williams, Darren	Lecture Language	English
Course Title	Korea	암생물학 개론							
	English	Introductory Cancer Biology							
Course Outline	This course provides a foundation and basic knowledge for understanding Cancer Biology. The mechanisms that lead to the transformation of a normal cell into a cancer cell will be described. Examples of different types of tumors and approaches to treating or preventing cancer are also taught in this course. The materials in this course should be suitable for both life science students and students from other departments who are interested in understanding cancer.								
Prerequisite									
Textbook & References	The Biology of Cancer; Chapters 1-8 (Robert A. Weinberg, Garland Science; 1st or 2nd edition)								
Etcetera	No extra requirements are needed for this course								

Weekly Course Schedule

Week	Description	*Remarks
1st	Course introduction and Part 1: The biology and genetics of cells and organisms	Darren R. Williams
2nd	Part 1: The biology and genetics of cells and organisms - continued	Darren R. Williams
3rd	Part 2: The nature of cancer	Darren R. Williams
4th	Part 3: Tumor viruses	Darren R. Williams
5th	Part 3: Tumor viruses - continued	Darren R. Williams
6th	Part 4: Cellular oncogenes	Darren R. Williams
7th	Part 4: Cellular oncogenes - continued	Darren R. Williams
8th	Mid-term exam	Darren R. Williams
9th	Part 5: Growth factors and their receptors	Darren R. Williams
10th	Part 6: Cytoplasmic signaling circuitry programs many of the traits of cancer	Darren R. Williams
11th	Part 6: Cytoplasmic signaling circuitry programs many of the traits of cancer - continued	Darren R. Williams
12th	Part 7: Tumor suppressor gene pRB and control of the cell cycle clock	Darren R. Williams
13th	Part 7: Tumor suppressor gene pRB and control of the cell cycle clock - continued	Darren R. Williams
14th	Part 8: p53 and apoptosis: master guardian and executioner	Darren R. Williams
15th	Part 8: p53 and apoptosis: master guardian and executioner - continued	Darren R. Williams
16th	Final exam	Darren R. Williams

*If there will be experiments, mark it in the "Remarks" section.

Instructor (seal)

Lecture Language

광주과학기술원

개설SYLLABUS

대학분류 : GIST대학 년도 : 2019 학기 : 1학기 교과목번호 : BS4213

Classification	GIST College	Course No.	BS4213-01	Hrs:E:Credits	3/0/3	Instructor	Song, Woo Keun	Lecture Language	English
Course Title	Korea	의학 면역화학							
	English	Medical Immunochemistry							
Course Outline	This Course will be discussed about Antigen structure, Ab structure, reaction of Ag-Ab. Clinical application of Ag-Ab reaction. Immunological methods.								
Prerequisite									
Textbook & References	Lecture & Discussion								
Etcetera									

Weekly Course Schedule

Week	Description	*Remarks
1st	Antigenic determinant	Woo Keun Song
2nd	Antigenic determinant	Woo Keun Song
3rd	Immunological Method in Biological Sciences	Woo Keun Song
4th	Immunological Method in Biological Sciences	Woo Keun Song
5th	Analysis of antibody characteristics	Woo Keun Song
6th	Analysis of antibody characteristics	Woo Keun Song
7th	Antibody-Antigen reaction	Woo Keun Song
8th	Mid-term Exam	Woo Keun Song
9th	Antibody-Antigen reaction	Woo Keun Song
10th	Detection of Ab-Ag Complex	Woo Keun Song
11th	Detection of Ab-Ag Complex	Woo Keun Song
12th	Characteristics of Idrotypic Antibody	Woo Keun Song
13th	Clinical application of Ag-Ab coplex	Woo Keun Song
14th	Clinical application of Ag-Ab coplex	Woo Keun Song
15th	Clinical application of Ag-Ab coplex	Woo Keun Song
16th	Final Exam	Woo Keun Song

*If there will be experiments, mark it in the "Remarks" section.

Instructor (seal)

Lecture Language

광주과학기술원

개설SYLLABUS

대학분류 : GIST대학 년도 : 2019 학기 : 1학기 교과목번호 : BS4216

Classification	GIST College	Course No.	BS4216-01	Hrs:E:Credits	3/0/3	Instructor	Yoo,Yung Joon	Lecture Language	English
Course Title	Korea	단백질과 생명과학							
	English	Proteins in Life Sciences							
Course Outline	Proteins are the major workforce in the cell. Where do they come from? What are they? What do they do? Where do they go? This course will cover the life of protein from the cradle to the grave: birth, maturation, trafficking, modification, interaction, and degradation. Protein homeostasis, protein quality control, and the related diseases will be discussed based on the recent publications.								
Prerequisite									
Textbook & References	[1] Biochemistry by Garrett and Grisham (6th ed); [2] Structural Biology by Liljas et al (2nd ed); [3] The Cell: a Molecular Approach by Cooper GM (7th ed); [4] Annual Review of Biochemistry (ARB)								
Etcetera									

Weekly Course Schedule

Week	Description	*Remarks
1st	1. Protein's Life Cycle	[1] Chapter 31
2nd	2. Protein's Birth (Translation)	[1], [2]
3rd	3. Information Transler for Protein's Birth (Transcription)	[1],[2]
4th	4. Proteins's Maturation (Folding and Processing)	[3]
5th	5. Shapes of Proteins (Structures)	[2]
6th	6. Flexible Shape: Intrinsically Disordered Proteins (IDPs)	ARB
7th	7. Protein's Modifications (PTMs)	ARB
8th	Mid-Term Exam	
9th	8. Protein's Journey Part I (Sorting and Translocation)	[3], ARB
10th	9. Protein's Journey Part II (Sorting and Trnslocation)	[3], ARB
11th	10. Protein's Social Life (Interactions)	papers
12th	11. Protein's Death (Degradation)	ARB
13th	12. Proteasomal and Autophagic Degradation System	ARB(2017) 86:193-
14th	10 Protein Quality Control (PQC) and Aging	ARB
15th	13. Case Study: p53 as an anticancer drug targets	papers
16th	Final Exam	-

*If there will be experiments, mark it in the "Remarks" section.

Instructor (seal)

Lecture Language