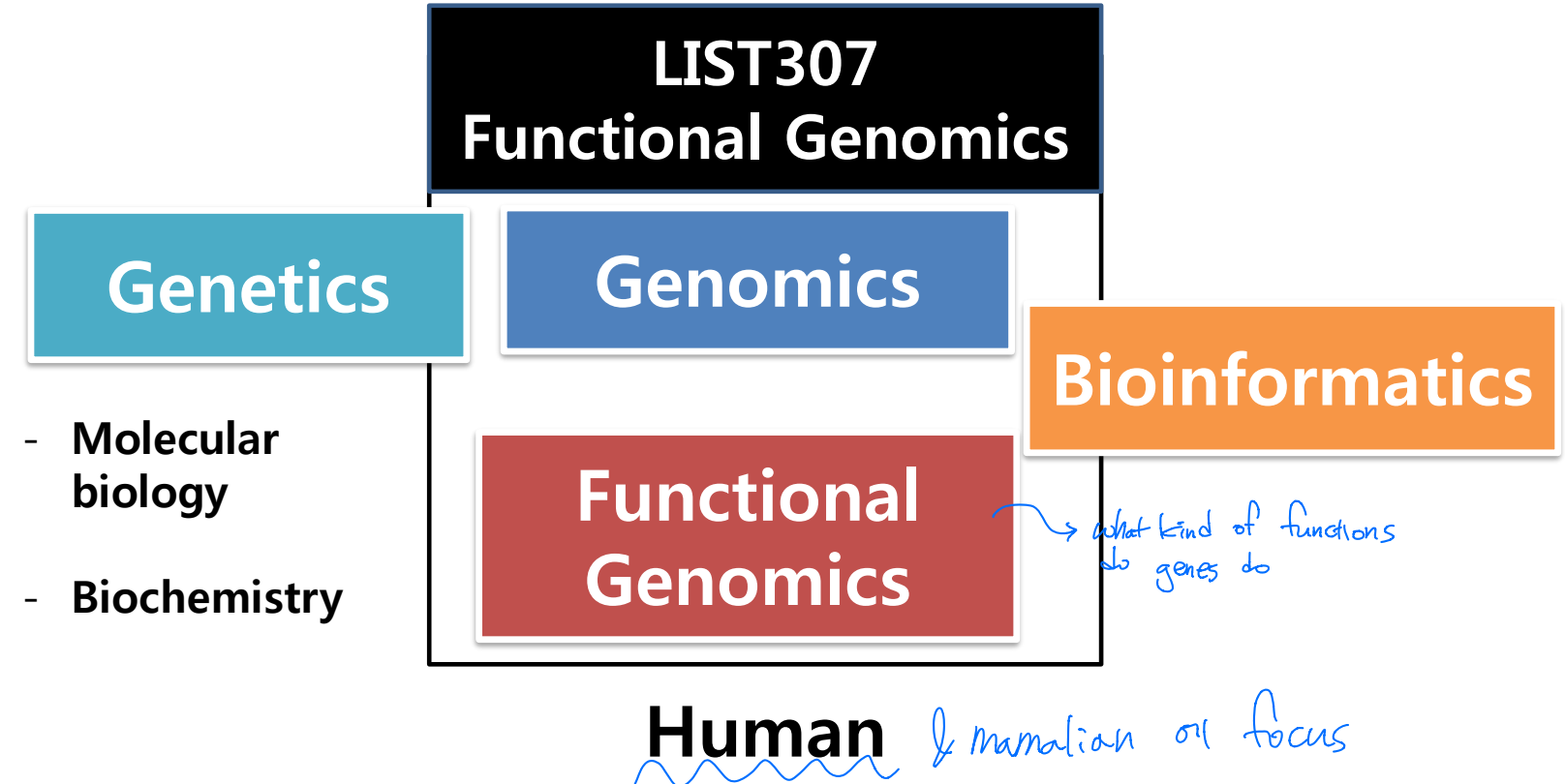
LIST307: Functional Genomics

Hana Science Hall A b131 (Tuesday, Thursday 17:00 – 18: 15)

Sung Wook Chi (Hana Science Hall A312, chi13@korea.ac.kr)

출석 20%.



LIST307: Functional Genomics

* Evaluation
- Attendance: 20%
(Please don't forget to write your signature on attendance sheet)

- Middle-term exam: 40% Final-term exam: 40%

* Handout (uploaded in Blackboard)
- **Lecture slides**
- Review papers, research articles, and exercises from textbook #1

*** Textbook #1**
- "A Primer of Genome Science", 3rd Edition (2009), by Gibson and Muse

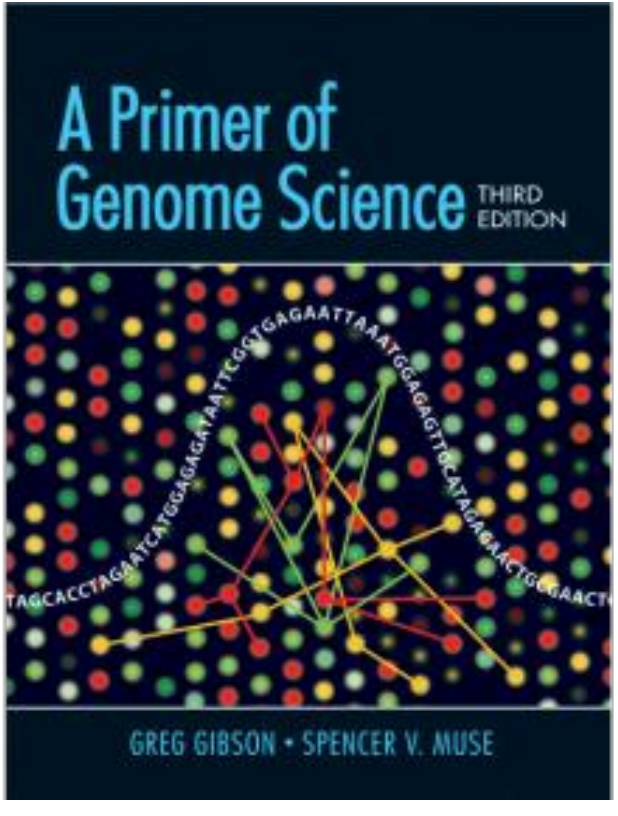
*** Textbook #2**
- "Introduction to Genomics", 3rd Edition (2017), by Lesk

- Second edition is provided (Blackboard)

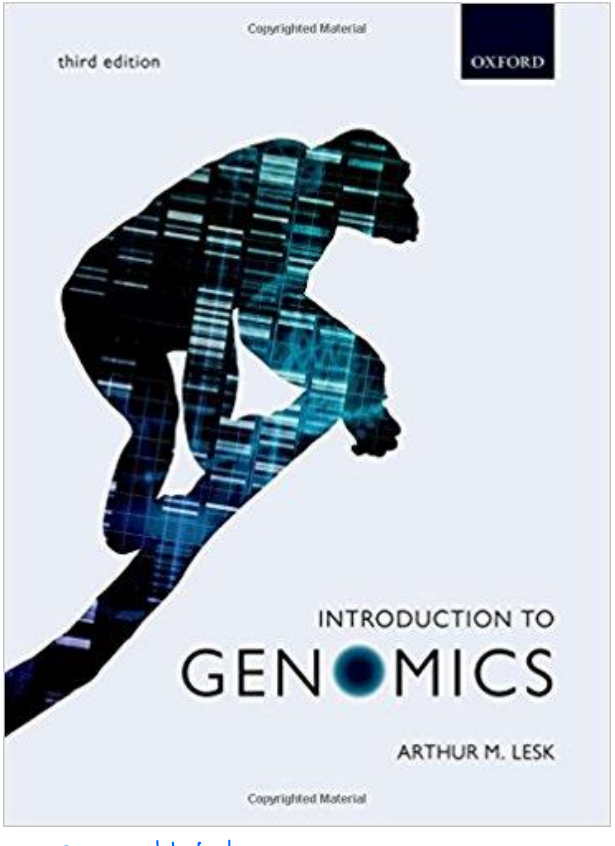
LIST307: Functional Genomics

살필것 없음

* Textbook #1



* Textbook #2



2017 published

LIST307: Functional Genomics

Genomics

Week	Date	Contents	Textbook1	Textbook2
1	3/6 (Tue) 3/8 (Thu)	Orientation No class		Chapter 1,2
2	3/13 (Tue) 3/15 (Thu)	1. Introduction to Genomics : Genome Mapping	Chapter 1 Chapter 1,2	Chapter 1 Chapter 1,3
3	3/20 (Tue) 3/22 (Thu)	2. Human Genome Project : Genome Sequencing, Analyses and Annotation	Chapter 1,2 Chapter 1,2	Chapter 2 Chapter 3,4
4	3/27 (Tue) 3/29 (Thu)	3. Next-Generation Sequencing (NGS) : Whole Genome Sequencing (WGS)	Handout	Chapter 2
5	4/3 (Tue) 4/5 (Thu)	4. Genomic Variation (LD, SNP, GWAS) : Linkage Disequilibrium (LD), haplotype	Chapter 3 Chapter 4	Chapter 4 Chapter 7,8
6	4/10 (Tue) 4/12 (Thu)	: SNP, GWAS, Exome-Seq 5. Basics of Functional Genomics	Handout Chapter 5	
7	4/17 (Tue) 4/19 (Thu)	6. Comparative Genomics (phylogenetics) * Review of part I	Chapter 3,4 Lecture slides	Chapter 4,9 Lecture slides
8	**4/24(Thu) 4/26(Tue)**	**Middle-term Exam**		

analyze variation after sequencing

genes ← what their function is

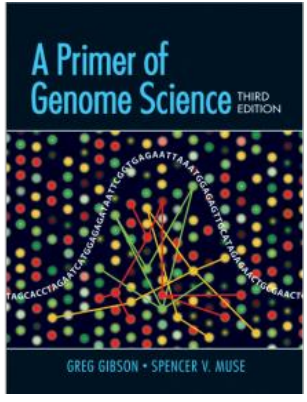
Functional Genomics

99% gene 같음 but people have different phenotype

9	5/1 (Tue) 5/3 (Thu)	7. Gene expression analysis (microarray) : Gene expression (RNA-Seq)	Chapter 4 Handout	Chapter 10
10	5/8 (Tue) 5/10 (Thu)	: Gene expression analysis 8. Transcriptomics (ChIP-Seq)	Chapter 4 Handout	Chapter 10
11	5/15 (Tue) 5/17 (Thu)	: regulation (Ribo-Seq, CLIP-Seq) 9. Proteomics	Handout Chapter 5	Handout Chapter 11
12	5/22 (Tue) 5/24 (Thu)	Holiday (No class) 10. Structural Genomics	Chapter 5	Chapter 11
13	5/29 (Tue) 5/31 (Thu)	11. Metabolomics and other omics. 12. Systems Biology	Chapter 6 Chapter 6	Chapter 12 Chapter 13
14	6/5 (Tue) 6/7 (Thu)	: Biological network : Modeling & analysis	Chapter 6 handout	Chapter 13
15	6/12 (Tue) 6/14 (Thu)	13. Bioinformatics * Review of part II	handout Lecture slides	Lecture slides
16	**6/19 (Tue) 6/21 (Thu)**	**Final-term Exam**		

1. Genomics / Genetics
2. Sequencing
   - Human Genome Project
   - Next-generation Sequencing (NGS)
3. Genome analysis
   - Linkage Disequilibrium
   - Variation (SNP, SWAS)
   - WGS, Exom-Seq
4. Functional Genomics
5. Comparative Genomics

1. Gene expression analysis
   - Microarray, RNA-Seq
   - Transcriptomics
2. Transcriptomics
   - Regulation (ChIP-Seq)
   - Ribo-Seq, CLIP-Seq
3. Proteomics
   - Structural genomics
4. Systems biology
   - Network biology
5. Bioinformatics (integration)



* Textbook #1

- "A Primer of Genome Science", 3rd Edition (2009), by Gibson and Muse

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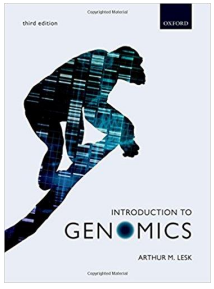

* Textbook #2

- "Introduction to Genomics",
3rd Edition (2017), by Lesk

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1: Introduction
2: The Human Genome Project
3: Mapping, Sequencing, Annotation, and Databases
4: Evolution and Genomic Change
5: Genomes of Prokaryotes and Viruses
6: Genomes of Eukaryotes
7: Comparative Genomics
8: The Impact of Genomics on Human Health and Disease
9: Genomics and Anthropology
10: Transcriptomics
11: Proteomics
12: Metabolomics
13: Systems Biology