BIOSC 1280 MICROBIAL GENETIC ENGINEERING SPRING TERM 2017 SYLLABUS AND COURSE POLICIES

LECTURERS: Dr. Karen Arndt Dr. Graham Hatfull

A316 Langley Hall 378 Crawford Hall

Office hours: by appointment Office hours: by appointment

Phone: 624-6963 Phone: 624-4350 email: arndt@pitt.edu email: gfh@pitt.edu

LECTURES: Mon., Wed., Fri. 11:00 – 11:50 a.m.

Langley Hall, Room A214

COURSE DESCRIPTION

Microbes – both prokaryotic and eukaryotic – are critical to our understanding of the fundamentals of biology at the molecular level as well as for understanding human diseases. Microbes such as bacteria and yeast are advantageous in that they can be grown to very large numbers in small volumes, making them ideal for genetic approaches that require the isolation of mutants with informative phenotypes and for understanding the roles that genes perform. In this course we will discuss fundamental aspects of microbial genetics in bacteria and yeast and how this information can be used to understand pathogenic and inherent human diseases.

LEARNING OBJECTIVES

Upon completing this course, you will be able to apply the theories of classical and modern molecular genetic analysis of prokaryotic and eukaryotic microorganisms to current problems in microbial genetics.

PREREQUISITES

Completion of BioSc1850 Microbiology, with a grade of C or better. Please consult with the instructors if you have not satisfied this requirement or the prerequisites for BioSc1850.

TEXTBOOKS

Required

Molecular Genetics of Bacteria, fourth edition (2013), by Larry Snyder, Joseph Peters, Tina Henkin and Wendy Champness. Published by ASM Press, Washington D.C. This textbook contains readings and problems that are **required** for successful completion of the prokaryotic section of the course. This book is on reserve in Langley Library.

Suggested

Additional suggested reading will be provided throughout the course. To supplement the yeast section of the course, readings from a general Genetics textbook will be recommended.

COURSE EXPECTATIONS AND REQUIREMENTS

Assignments: Regularly throughout the course, you will be given scientific papers to read. You will be required to write a brief synopsis of either the whole paper or a component (as instructed). In addition, you will periodically receive problems sets to test your mastery of the material.

Attendance: Attendance at all lectures is critical to success in the course.

Participation: You are expected to participate in class discussions of both lecture material and assignments.

EXAMINATIONS

There will be a total of three examinations. The first two are **midterm exams** given during regular class meetings and will primarily focus on the material covered since the beginning of class or the prior exam. The **final exam** will be given on Saturday, April 29, 2017 at 10:00 until 11:50 am. **The Final Exam will include material from the entire course.** If you are not able to be present for any one of the exams, you must notify the instructors prior to the exam in writing.

GRADING

Your final grade will be based on the two mid-term exams, one comprehensive final exam, homework assignments, and participation in class discussion. Each mid-term exam will contribute 100 points, the final exam will contribute 200 points and take home assignments will contribute 60 points to your final grade. Participation in class discussion is worth a total of 40 points. Each exam will contain multiple-choice, true-or-false, short answer, and long answer questions.

Make-up Policy: Make-up exams will only be provided if a legitimate excuse is given for missing an exam; specific arrangements should be made with the instructors prior to the scheduled exam. A doctor's notice is required for a medical excuse.

UNIVERSITY POLICIES:

Academic Integrity

Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity, from the February 1974 Senate Committee on Tenure and Academic Freedom reported to the Senate Council, will be required to participate in the outlined procedural process as initiated by the instructor. A minimum sanction of a zero score for the quiz or exam will be imposed.

View the complete policy at www.cfo.pitt.edu/policies/policy/02/02-03-02.html.

Disability Services

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services, 140 William Pitt Union, 412-648-7890/412-624-3346 (Fax), as early as possible in the term. Disability Resources and Services will verify your disability and determine reasonable

accommodations for this course. For more information, visit www.studentaffairs.pitt.edu/drsabout.

Copyright Notice

Course materials may be protected by copyright. United States copyright law, 17 USC section 101, et seq., in addition to University policy and procedures, prohibit unauthorized duplication or retransmission of course materials. See <u>Library of Congress Copyright Office</u> and the <u>University Copyright Policy</u>.

Statement on Classroom Recording

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

E-mail Communication Policy

Each student is issued a University e-mail address (username@pitt.edu) upon admittance. This e-mail address may be used by the University for official communication with students. Students are expected to read e-mail sent to this account on a regular basis. Failure to read and react to University communications in a timely manner does not absolve the student from knowing and complying with the content of the communications. The University provides an e-mail forwarding service that allows students to read their e-mail via other service providers (e.g., Hotmail, AOL, Yahoo). Students that choose to forward their e-mail from their pitt.edu address to another address do so at their own risk. If e-mail is lost as a result of forwarding, it does not absolve the student from responding to official communications sent to their University e-mail address. To forward e-mail sent to your University account, go to http://accounts.pitt.edu, log into your account, click on Edit Forwarding Addresses, and follow the instructions on the page. Be sure to log out of your account when you have finished. (For the full E-mail Communication Policy, go to https://accounts.pitt.edu/policies/policy/09/09-10-01.html.)

Turnitin

Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of Turnitin.com page service is subject to the Usage Policy and Privacy Pledge posted on the Turnitin.com site.

BIOSC1280 MICROBIAL GENETIC ENGINEERING: SPRING 2017

Drs. Arndt and Hatfull

Mon., Wed., Fri., 11:00-11:50am Langley A214

Introduction to Bacterial and Yeast Genetics	Day	Date	Topic	Instructor	Chapter
Non. 159 Nutrit : Essentials of Bacterial Genetics GFH 3					•
Fri. 1/6 Mutants and mutations: The currency of microbial genetics GFH 3 Mon. 1/9 Transformation and Transfection: Getting DNA into cells GFH 4 Wed. 1/11 Bacterial genomes and genomics GFH 4 Fri. 1/13 The microbiome Transcriptomics, Ribo-Seq GFH 4 Wed. 1/18 Regulation of gene expression GFH 1 Wed. 1/18 Resultation of gene expression GFH 12 Unt 12: Essentials of Yeast Genetics KMA MA Fri. 1/20 Yeast plasmids and transposons KMA Wed. 1/25 Yeast plasmids and transposons KMA Fri. 1/27 Gene expression and its regulation in a model eukaryote KMA Mon. 1/23 The yeast transcriptome KMA Wed. 2/1 First Mid-term Exam First Mid-term Exam Fri. 2/13 Bacterial diversity and evolution GFH Intro Mon. 2/6 Plasmids GFH Intro	Wed.	1/4	Introduction and Perspectives	GFH/KMA	
Mon. 1/9 Transformation and Transfection: Getting DNA into cells GFH 6					
Wed. 1/11 Bacterial genomes and genomics GFH 4					3
Fri. 1/13 The microbiome Transcriptomics, Ribo-Seq GFH Mon. 1/16 Dr. Martin Luther King's Birthday. No class GFH 12 Wed. 1/18 Regulation of gene expression GFH 12 Fri. 1/20 Yeast genome inheritance and organization KMA Mon. 1/23 Yeast genome inheritance and organization KMA Mon. 1/27 Gene expression and its regulation in a model eukaryote KMA Fri. 1/27 Gene expression and its regulation in a model eukaryote KMA Mon. 1/30 The yeast transcriptome KMA Wed. 2/1 First Mid-term Exam KMA Fri. 2/3 Bacterial diversity and evolution GFH Intro Mon. 2/3 Bacterial diversity and evolution GFH 4 Mon. 2/3 Bacterial diversity and evolution GFH 4 Mon. 2/3 Plasmids GFH 4 Fri. 2/10 Cnjugation GFH 7 <t< td=""><td></td><td></td><td></td><td></td><td>6</td></t<>					6
Mon. 1/16 Dr. Martin Luther King's Birthday. No class Wed. 1/18 Regulation of gene expression GFH 12 Wed. 1/20 Yeast life cycle KMA Mon. 1/23 Yeast plasmids and transposons KMA Fri. 1/27 Yeast plasmids and transposons KMA Fri. 1/27 Gene expression and its regulation in a model eukaryote KMA Mon. 1/30 The yeast transcriptome KMA Fri. 2/31 Bacterial diversity and evolution GFH MMA Mon. 2/6 Plasmids GFH 4 Wed. 2/8 Plasmids GFH 4 Fri. 2/10 Conjugation GFH 5 Mon. 2/6 Plasmids and phage systems - Lytic phages GFH 7 Wed. 2/15 Phages and phage systems - Lytic phages GFH 7 Wed. 2/15 Phages and phage systems - Lytic phages GFH 7 Wed. 2/22 CRISPR-Cas GFH 7 Wed. 2/22 CRISPR-Cas					4
Wed. 1/18 Regulation of gene expression GFH 12 Unit 2: Essentials of Yeast Genetics				GFH	
Unit 2: Essentials of Yeast Genetics				_	
Fri. 1/20 Yeast genome inheritance and organization KMA Wed. 1/23 Yeast genome inheritance and organization KMA Wed. 1/25 Yeast genome inheritance and organization KMA Mon. 1/27 Gene expression and its regulation in a model eukaryote KMA Mon. 1/30 The yeast transcriptome KMA Wed. 2/1 First Mid-term Exam First Mid-term Exam Fri. 2/3 Bacterial diversity and evolution GFH Intro Mon. 2/6 Plasmids GFH 4 Wed. 2/8 Plasmids GFH 4 Fri. 2/10 Conjugation GFH 4 Mon. 2/13 Transduction: Generalized and Specialized GFH 7/8 Wed. 2/17 Phages and phage systems – Lytic phages GFH 7 Fri. 2/17 Phages and phage systems – Lytic phages GFH 7 Fri. 2/17 Phages and phage systems – Lytic phages GFH 7	Wed.	1/18		GFH	12
Mon. 1/23 Yeast plasmids and transposons KMA Fin. 1/27 Gene expression and its regulation in a model eukaryote KMA Mon. 1/30 The yeast transcriptome KMA Wed. 2/1 First Mid-term Exam KMA Fri. 2/3 Bacterial diversity and evolution GFH Intro Mon. 2/6 Plasmids GFH 4 Wed. 2/8 Plasmids GFH 4 Mon. 2/6 Plasmids GFH 4 Mon. 2/13 Transduction: Generalized and Specialized GFH 7 Mon. 2/20 Conjugation GFH 5 Mon. 2/13 Transduction: Generalized and Specialized GFH 7/8 Wed. 2/15 Phages and phage systems – Lytic phages GFH 7 Wed. 2/15 Phages and phage systems – Lytic phages GFH 7 Wed. 2/12 CRISPR-Cas GFH 7 Wed. 2/22		4/00		148.4.4	
Wed. 1/25 Veast plasmids and transposons KMA Fri. 1/27 Gene expression and its regulation in a model eukaryote KMA Mon. 1/30 The yeast transcriptome KMA Wed. 2/1 First Mid-term Exam KMA Unit 3: The Microbiome FIR Intro KMO. 2/6 Plasmids GFH Intro Wed. 2/8 Plasmids GFH 4 Wed. 2/18 Plasmids GFH 4 Wed. 2/18 Plasmids GFH 7 Fri. 2/17 Phages and plage systems – Lytic phages GFH 7 Fri. 2/17 Phages and phage systems – Lytic phages GFH 7 Fri. 2/17 Phages and phage systems – Lytic phages GFH 7 Fri.					
Fri. 1/27 Gene expression and its regulation in a model eukaryote KMA Mon. 1/30 The yeast transcriptome KMA Fri. 2/3 The yeast transcriptome KMA Fri. 2/3 Bacterial diversity and evolution GFH Intro Mon. 2/6 Plasmids GFH 4 Wed. 2/8 Plasmids GFH 4 Fri. 2/10 Conjugation GFH 5 Mon. 2/13 Transduction: Generalized and Specialized GFH 7 Mon. 2/15 Phages and phage systems – Lytic phages GFH 7 Wed. 2/15 Phages and phage systems – Lytoc phages GFH 7 Fri. 2/20 CRISPR-Cas GFH 7 Wed. 2/22 CRISPR-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 7 Mon. 2/20 CRISPR-Cas GFH 7 Fri. 3/3 Tetrad ana					
Mon. 1/30 The yeast transcriptome First Mid-term Exam Unit 3: The Microbiome First Mid-term Exam Unit 3: The Microbiome Second Mid-term Exam Second Mid-term Exam Unit 3: The Microbiome SFH A			Consequences and transposons		
Wed. 2/1					
Fri. 2/3 Bacterial diversity and evolution GFH Intro				KIVIA	
Fri. 2/3 Bacterial diversity and evolution GFH 4 Mon. 2/6 Plasmids GFH 4 Wed. 2/8 Plasmids GFH 4 Fri. 2/10 Conjugation GFH 5 Mon. 2/13 Transduction: Generalized and Specialized GFH 7/8 Mon. 2/13 Transduction: Generalized and Specialized GFH 7/8 Wed. 2/15 Phages and phage systems – Lytochages GFH 7 Fri. 2/17 Phages and phage systems – Lytochages GFH 7 Mon. 2/20 CRISPR-Cas GFH 7 Wed. 2/22 CRISPR-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 7 Fri. 2/25 Toxin-Antitoxin systems GFH 7 Wed. 3/1 Tetrad analysis: the basics KMA Fri. 2/2 Toxin-Antitoxin systems KMA Mon. 3/13	vvea.	Z/ I			
Mon. 2/6 Plasmids GFH 4 Wed. 2/8 Plasmids GFH 4 Fri. 2/10 Conjugation GFH 5 Mon. 2/13 Transduction: Generalized and Specialized GFH 7 Wed. 2/15 Phages and phage systems – Lytic phages GFH 7 Fri. 2/17 Phages and phage systems – Lytic phages GFH 7 Mon. 2/20 CRISPR-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 7 Mon. 2/27 Toxin-Antitoxin systems GFH 4 Mon. 2/27 Toxin-Antitoxin systems KMA Wed. 3/1 Tetrad analysis: the basics KMA Fri. 3/3 Tetrad analysis: gene mapping KMA Mon. 3/13 Mutant hunts and cloning genes KMA Mon. 3/13 Mutant hunts and cloning genes KMA Mon. 3/20 Bacterial Transposons – What are they?	Fri	2/3		GEH	Intro
Wed. 2/8 Plasmids GFH 4 Fri. 2/10 Conjugation GFH 5 Mon. 2/13 Transduction: Generalized and Specialized GFH 7 Wed. 2/15 Phages and phage systems – Lytop phages GFH 7 Fri. 2/17 Phages and phage systems – Lysogeny GFH 7 Mon. 2/20 CRISPR-Cas GFH 7 Wed. 2/22 CRISPR-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 4 Wed. 2/22 CRISPR-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 4 Wed. 3/12 Mendellian inheritance/ mitosis and meiosis refresher KMA KMA Mon. 2/27 Mendellian inheritance/ mitosis and meiosis refresher KMA KMA Fri. 3/3 Tetrad analysis: the basics KMA KMA Mon. 3/12 Spring Recess. No Class KMA <					
Fri. 2/10 Conjugation GFH 5 Mon. 2/13 Transduction: Generalized and Specialized GFH 7/8 Wed. 2/15 Phages and phage systems – Lytic phages GFH 7 Fri. 2/17 Phages and phage systems – Lytopages GFH 7 Mon. 2/20 CRISPR-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 7 Wed. 2/22 CRISPR-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 4 Wed. 2/27 Mendelian inheritance/ mitosis and meiosis refresher KMA FH Fri. 3/3 Tetrad analysis: the basics KMA KMA Fri. 3/3 Tetrad analysis: gene mapping KMA KMA Mon. 3/13 Mutant hunts and cloning genes KMA KMA Fri. 3/13 Mutant hunts and cloning genes KMA KMA Fri. 3/17 Second Mid-term Exam <t< td=""><td></td><td></td><td></td><td></td><td></td></t<>					
Mon. 2/13 Transduction: Generalized and Specialized GFH 7/8 Wed. 2/15 Phages and phage systems – Lytic phages GFH 7 Fri. 2/17 Phages and phage systems – Lysogeny GFH 7 Mon. 2/20 CRISPR-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 7 Mon. 2/27 Inspra-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 7 Mon. 2/27 Mendelian inheritance/ mitosis and meiosis refresher KMA Image: MMA Wed. 3/1 Tetrad analysis: the basics KMA Image: MMA Fri. 3/3 Tetrad analysis: gene mapping KMA Image: MMA Joseph Gecess. NO Class MMA Image: MMA Image: MMA Wed. 3/15 Mutant hunts and cloning genes KMA Image: MMA Image: MMA Wed. 3/17 Bacterial Transposons – Hore there there GFH 9					
Wed. 2/15 Phages and phage systems – Lytic phages GFH 7 Fri. 2/17 Phages and phage systems – Lytopages GFH 7 Mon. 2/20 CRISPR-Cas GFH 7 Wed. 2/22 Toxin-Antitoxin systems GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 7 Mon. 2/27 Mendelian inheritance/ mitosis and meiosis refresher KMA Wed. 3/1 Tetrad analysis: the basics KMA Fri. 3/3 Tetrad analysis: gene mapping KMA Mon. 3/17 Spring Recess. No Class KMA Mon. 3/13 Mutant hunts and cloning genes KMA Wed. 3/15 Mutant hunts and cloning genes KMA Fri. 3/17 Second Mid-term Exam WMA Mon. 3/20 Bacterial Transposons – What are they? GFH 9 Wed. 3/22 Bacterial Transposons – How can we use them? GFH 9 Fri. 3/29					
Wed. 2/15 Phages and phage systems – Lytic phages GFH 7 Fri. 2/17 Phages and phage systems – Lysogeny GFH 7 Mon. 2/20 CRISPR-Cas GFH 7 Wed. 2/22 CRISPR-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 4 Mon. 2/27 Mendelian inheritance/ mitosis and meiosis refresher KMA Wed. 3/1 Tetrad analysis: the basics KMA Fri. 3/3 Tetrad analysis: gene mapping KMA 3/5-3/12 Spring Recess. No Class Mon. 3/13 Mutant hunts and cloning genes KMA Fri. 3/15 Mutant hunts and cloning genes KMA Fri. 3/15 Mutant hunts and cloning genes KMA Mon. 3/20 Bacterial Transposons – What are they? GFH 9 Wed. 3/22 Bacterial Transposons – How can we use them? GFH 9 Fri. 3/24 Gene replacement by homologous recombination GFH 10 Mon. 3/29 CRISPR-Cas revisited GFH 10 Wed. 3/29 CRISPR-Cas revisited GFH 10 Wed.	1110111	2, 10		0111	170
Fri. 2/17 Phages and phage systems – Lysogeny GFH 7 Mon. 2/20 CRISPR-Cas GFH 7 Wed. 2/22 CRISPR-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 4 Wed. Ji24 Toxin-Antitoxin systems GFH 4 Wed. Ji27 Mendelian inheritance / mitosis and meiosis refresher KMA Wed. Ji31 Tetrad analysis: the basics KMA Fri. 3/3 Tetrad analysis: gene mapping KMA Jospring Recess. No Class KMA Mon. 3/15 Mutant hunts and cloning genes KMA Wed. 3/15 Mutant hunts and cloning genes KMA Fri. 3/17 Second Mid-term Exam Wed. Ji31 Mutant hunts and cloning genes KMA Mon. 3/20 Bacterial Transposons – What are they? GFH 9 Wed. 3/22 Bacterial Transposons – How can we use them? GFH 9 Fri. 3/24 Gene replacement by homologous recombination GFH 10 Wed. 3/29 CRISPR-Cas revisited GFH 10 Wed. Juit 7: The Genetic Landscape	Wed.	2/15		GFH	7
Mon. 2/20 CRISPR-Cas GFH 7 Wed. 2/22 CRISPR-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 4 Wed. 2/27 Mendelian inheritance/ mitosis and meiosis refresher KMA Wed. 3/1 Tetrad analysis: the basics KMA Fri. 3/3 Tetrad analysis: gene mapping KMA 3/5-3/12 Spring Recess. No Class KMA Mon. 3/13 Mutant hunts and cloning genes KMA Fri. 3/17 Second Mid-term Exam KMA Wed. 3/15 Mutant hunts and cloning genes KMA Fri. 3/17 Second Mid-term Exam KMA Wed. 3/20 Bacterial Transposons – What are they? GFH 9 Wed. 3/22 Bacterial Transposons – How can we use them? GFH 9 Fri. 3/24 Gene replacement by homologous recombination GFH 9 Wed. 3/29 CRISPR-Cas revisited GFH <t< td=""><td></td><td></td><td></td><td></td><td>7</td></t<>					7
Wed. 2/22 CRISPR-Cas GFH 7 Fri. 2/24 Toxin-Antitoxin systems GFH 4 Mon. 2/27 Mendelian inheritance/ mitosis and meiosis refresher KMA Wed. 3/1 Tetrad analysis: the basics KMA Fri. 3/3 Tetrad analysis: gene mapping KMA Mon. 3/13 Mutant hunts and cloning genes KMA Mon. 3/15 Mutant hunts and cloning genes KMA Fri. 3/17 Second Mid-term Exam KMA Wed. 3/15 Mutant hunts and cloning genes KMA Mon. 3/17 Second Mid-term Exam Second Mid-term Exam Junit 6: Bacterial Transposons – What are they? GFH 9 Wed. 3/22 Bacterial Transposons – How can we use them? GFH 9 Wed. 3/24 Gene replacement by homologous recombination GFH 10 Mon. 3/27 Recombineering GFH 10 Wed. 3/29 CRISPR-Cas revisited GFH <td></td> <td></td> <td></td> <td></td> <td>7</td>					7
Unit 5: Yeast: The Fundamentals of Inheritance and Mutant Isolation	Wed.	2/22		GFH	7
Unit 5: Yeast: The Fundamentals of Inheritance and Mutant Isolation	Fri.	2/24	Toxin-Antitoxin systems	GFH	4
Wed. 3/1 Tetrad analysis: the basics KMA Fri. 3/3 Tetrad analysis: gene mapping KMA 3/5-3/12 Spring Recess. No Class KMA Mon. 3/15 Mutant hunts and cloning genes KMA Fri. 3/17 Second Mid-term Exam KMA Fri. 3/17 Second Mid-term Exam GFH Mon. 3/20 Bacterial Transposons – What are they? GFH 9 Wed. 3/22 Bacterial Transposons – How can we use them? GFH 9 Fri. 3/24 Gene replacement by homologous recombination GFH 10 Mon. 3/27 Recombineering GFH 10 Wed. 3/29 CRISPR-Cas revisited GFH 10 Wed. 3/29 CRISPR-Cas revisited GFH 10 Won. 4/3 Genetic interactions—What are they? KMA Mon. 4/3 Genetic interactions—What are they? KMA Mon. 4/3 Genetic interactions—What are they? KMA Mon. 4/3 Genetic interactions—What are they?					
Fri. 3/3 Tetrad analysis: gene mapping 3/5-3/12 Spring Recess. No Class Mon. 3/13 Mutant hunts and cloning genes KMA Wed. 3/15 Mutant hunts and cloning genes KMA Wed. 3/15 Mutant hunts and cloning genes KMA Second Mid-term Exam Unit 6: Bacterial Genome Engineering Mon. 3/20 Bacterial Transposons – What are they? Wed. 3/22 Bacterial Transposons – How can we use them? Fri. 3/24 Gene replacement by homologous recombination GFH 9 Wed. 3/29 CRISPR-Cas revisited GFH Unit 7: The Genetic Landscape of a Model Eukaryote Fri. 3/31 Genetic interactions—What are they? KMA Mon. 4/3 Genetic interactions—What can we learn from them? KMA Wed. 4/5 Genomic toolbox for a model eukaryote KMA Fri. 4/10 Genetics in a genomic era: dissecting interaction networks Unit 8: Putting Yeast to Work: Improving Human Health Wed. 4/12 Quantitative traits Fri. 4/14 Proteomic toolbox for a model eukaryote KMA Mon. 4/17 Yeast as a model human: understanding cancer KMA Fri. 4/21 Catch-up & Review session GFH/KMA	Mon.	2/27	Mendelian inheritance/ mitosis and meiosis refresher		
Spring Recess. No Class Mon. 3/13 Mutant hunts and cloning genes KMA KMA Wed. 3/15 Mutant hunts and cloning genes KMA KMA	Wed.	3/1	Tetrad analysis: the basics	KMA	
Mon. 3/13 Mutant hunts and cloning genes KMA Wed. 3/15 Mutant hunts and cloning genes KMA Fri. 3/17 Second Mid-term Exam Unit 6: Bacterial Genome Engineering Bacterial Transposons – What are they? GFH 9 Wed. 3/20 Bacterial Transposons – How can we use them? GFH 9 Fri. 3/24 Gene replacement by homologous recombination GFH 10 Mon. 3/27 Recombineering GFH 10 Wed. 3/29 CRISPR-Cas revisited GFH 10 Wed. 3/31 Genetic interactions—What are they? KMA Mon. 4/3 Genetic interactions—What can we learn from them? KMA Wed. 4/5 Genomic toolbox for a model eukaryote KMA Fri. 4/7 Systematic vs. classical genetics KMA Mon. 4/10 Genetics in a genomic era: dissecting interaction networks KMA Wed. 4/12 Quantitative traits KMA Fri. 4/14 Proteomic toolbox for a model eukaryote KMA Mon. <				KMA	
Wed. 3/15 Mutant hunts and cloning genes KMA Fri. 3/17 Second Mid-term Exam Mon. 3/20 Bacterial Genome Engineering Wed. 3/22 Bacterial Transposons – What are they? GFH 9 Wed. 3/22 Bacterial Transposons – How can we use them? GFH 9 Fri. 3/24 Gene replacement by homologous recombination GFH 10 Mon. 3/27 Recombineering GFH 10 Wed. 3/29 CRISPR-Cas revisited GFH 10 Wed. 3/29 CRISPR-Cas revisited GFH 10 Won. 3/29 CRISPR-Cas revisited GFH 10 Won. 3/29 CRISPR-Cas revisited GFH WMA Fri. 3/31 Genetic interactions—What are they? KMA Mon. 4/3 Genetic interactions—What are they? KMA Wed. 4/5 Genomic toolbox for a model eukaryote KMA Fri. 4/7 Systematic vs. classical genetics KMA Wed. 4/10 Genetics in a genomic era					
Fri. 3/17 Second Mid-term Exam Unit 6: Bacterial Genome Engineering Mon. 3/20 Bacterial Transposons – What are they? GFH 9 Wed. 3/22 Bacterial Transposons – How can we use them? GFH 9 Fri. 3/24 Gene replacement by homologous recombination GFH 10 Mon. 3/27 Recombineering GFH 10 Wed. 3/29 CRISPR-Cas revisited GFH Unit 7: The Genetic Landscape of a Model Eukaryote Fri. 3/31 Genetic interactions—What are they? KMA Mon. 4/3 Genetic interactions—What are they? KMA Wed. 4/5 Genomic toolbox for a model eukaryote KMA Fri. 4/7 Systematic vs. classical genetics Wed. 4/10 Genetics in a genomic era: dissecting interaction networks KMA Unit 8: Putting Yeast to Work: Improving Human Health Wed. 4/12 Quantitative traits Fri. 4/14 Proteomic toolbox for a model eukaryote KMA Fri. 4/14 Proteomic toolbox for a model eukaryote KMA Wed. 4/17 Yeast as a model human: understanding cancer KMA Wed. 4/19 Yeast as a model human: protein-folding based diseases KMA Fri. 4/21 Catch-up & Review session GFH/KMA	Mon.			KMA	
Unit 6: Bacterial Genome Engineering				KMA	
Mon.3/20Bacterial Transposons – What are they?GFH9Wed.3/22Bacterial Transposons – How can we use them?GFH9Fri.3/24Gene replacement by homologous recombinationGFH10Mon.3/27RecombineeringGFH10Wed.3/29CRISPR-Cas revisitedGFHUnit 7: The Genetic Landscape of a Model EukaryoteFri.3/31Genetic interactions—What are they?KMAMon.4/3Genetic interactions—What can we learn from them?KMAWed.4/5Genomic toolbox for a model eukaryoteKMAFri.4/7Systematic vs. classical geneticsKMAMon.4/10Genetics in a genomic era: dissecting interaction networksKMAUnit 8: Putting Yeast to Work: Improving Human HealthKMAWed.4/12Quantitative traitsKMAFri.4/14Proteomic toolbox for a model eukaryoteKMAMon.4/17Yeast as a model human: understanding cancerKMAWed.4/19Yeast as a model human: protein-folding based diseasesKMAFri.4/21Catch-up & Review sessionGFH/KMA	Fri.	3/17			
Wed.3/22Bacterial Transposons – How can we use them?GFH9Fri.3/24Gene replacement by homologous recombinationGFH10Mon.3/27RecombineeringGFH10Wed.3/29CRISPR-Cas revisitedGFHUnit 7: The Genetic Landscape of a Model EukaryoteFri.3/31Genetic interactions—What are they?KMAMon.4/3Genetic interactions—What can we learn from them?KMAWed.4/5Genomic toolbox for a model eukaryoteKMAFri.4/7Systematic vs. classical geneticsKMAMon.4/10Genetics in a genomic era: dissecting interaction networksKMAWed.4/12Quantitative traitsKMAFri.4/14Proteomic toolbox for a model eukaryoteKMAMon.4/17Yeast as a model human: understanding cancerKMAWed.4/19Yeast as a model human: protein-folding based diseasesKMAFri.4/21Catch-up & Review sessionGFH/KMA					
Fri. 3/24 Gene replacement by homologous recombination GFH 10 Mon. 3/27 Recombineering GFH 10 Wed. 3/29 CRISPR-Cas revisited GFH Unit 7: The Genetic Landscape of a Model Eukaryote Fri. 3/31 Genetic interactions—What are they? Mon. 4/3 Genetic interactions—What can we learn from them? Wed. 4/5 Genomic toolbox for a model eukaryote Fri. 4/7 Systematic vs. classical genetics Mon. 4/10 Genetics in a genomic era: dissecting interaction networks Unit 8: Putting Yeast to Work: Improving Human Health Wed. 4/12 Quantitative traits Fri. 4/14 Proteomic toolbox for a model eukaryote Mon. 4/17 Yeast as a model human: understanding cancer Wed. 4/19 Yeast as a model human: protein-folding based diseases Fri. 4/21 Catch-up & Review session			Bacterial Transposons – What are they?		
Mon.3/27RecombineeringGFH10Wed.3/29CRISPR-Cas revisitedGFHUnit 7: The Genetic Landscape of a Model EukaryoteFri.3/31Genetic interactions—What are they?KMAMon.4/3Genetic interactions—What can we learn from them?KMAWed.4/5Genomic toolbox for a model eukaryoteKMAFri.4/7Systematic vs. classical geneticsKMAMon.4/10Genetics in a genomic era: dissecting interaction networksKMAWed.4/12Quantitative traitsKMAFri.4/14Proteomic toolbox for a model eukaryoteKMAMon.4/17Yeast as a model human: understanding cancerKMAWed.4/19Yeast as a model human: protein-folding based diseasesKMAFri.4/21Catch-up & Review sessionGFH/KMA		1			
Wed. 3/29 CRISPR-Cas revisited GFH Unit 7: The Genetic Landscape of a Model Eukaryote Fri. 3/31 Genetic interactions—What are they? KMA Mon. 4/3 Genetic interactions—What can we learn from them? KMA Wed. 4/5 Genomic toolbox for a model eukaryote KMA Fri. 4/7 Systematic vs. classical genetics KMA Mon. 4/10 Genetics in a genomic era: dissecting interaction networks KMA Wed. 4/12 Quantitative traits KMA Fri. 4/14 Proteomic toolbox for a model eukaryote KMA Mon. 4/17 Yeast as a model human: understanding cancer KMA Wed. 4/19 Yeast as a model human: protein-folding based diseases KMA Fri. 4/21 Catch-up & Review session GFH/KMA					
Unit 7: The Genetic Landscape of a Model Eukaryote Fri. 3/31 Genetic interactions—What are they? Mon. 4/3 Genetic interactions—What can we learn from them? KMA Wed. 4/5 Genomic toolbox for a model eukaryote Fri. 4/7 Systematic vs. classical genetics Mon. 4/10 Genetics in a genomic era: dissecting interaction networks Unit 8: Putting Yeast to Work: Improving Human Health Wed. 4/12 Quantitative traits Fri. 4/14 Proteomic toolbox for a model eukaryote Mon. 4/17 Yeast as a model human: understanding cancer Wed. 4/19 Yeast as a model human: protein-folding based diseases Fri. 4/21 Catch-up & Review session KMA					10
Fri. 3/31 Genetic interactions—What are they? Mon. 4/3 Genetic interactions—What can we learn from them? Wed. 4/5 Genomic toolbox for a model eukaryote Fri. 4/7 Systematic vs. classical genetics Mon. 4/10 Genetics in a genomic era: dissecting interaction networks Wed. 4/12 Quantitative traits Fri. 4/14 Proteomic toolbox for a model eukaryote Mon. 4/17 Yeast as a model human: understanding cancer Wed. 4/19 Yeast as a model human: protein-folding based diseases Fri. 4/21 Catch-up & Review session KMA KMA KMA KMA KMA GFH/KMA	wed.	3/29		ОГП	
Mon.4/3Genetic interactions What can we learn from them?KMAWed.4/5Genomic toolbox for a model eukaryoteKMAFri.4/7Systematic vs. classical geneticsKMAMon.4/10Genetics in a genomic era: dissecting interaction networksKMAUnit 8: Putting Yeast to Work: Improving Human HealthKMAWed.4/12Quantitative traitsKMAFri.4/14Proteomic toolbox for a model eukaryoteKMAMon.4/17Yeast as a model human: understanding cancerKMAWed.4/19Yeast as a model human: protein-folding based diseasesKMAFri.4/21Catch-up & Review sessionGFH/KMA	Eri	2/24		KMA	
Wed. 4/5 Genomic toolbox for a model eukaryote KMA Fri. 4/7 Systematic vs. classical genetics KMA Mon. 4/10 Genetics in a genomic era: dissecting interaction networks KMA Unit 8: Putting Yeast to Work: Improving Human Health KMA Wed. 4/12 Quantitative traits KMA Fri. 4/14 Proteomic toolbox for a model eukaryote KMA Mon. 4/17 Yeast as a model human: understanding cancer KMA Wed. 4/19 Yeast as a model human: protein-folding based diseases KMA Fri. 4/21 Catch-up & Review session GFH/KMA					
Fri. 4/7 Systematic vs. classical genetics KMA Mon. 4/10 Genetics in a genomic era: dissecting interaction networks KMA Unit 8: Putting Yeast to Work: Improving Human Health Wed. 4/12 Quantitative traits KMA Fri. 4/14 Proteomic toolbox for a model eukaryote KMA Mon. 4/17 Yeast as a model human: understanding cancer KMA Wed. 4/19 Yeast as a model human: protein-folding based diseases KMA Fri. 4/21 Catch-up & Review session GFH/KMA					
Mon. 4/10 Genetics in a genomic era: dissecting interaction networks KMA Unit 8: Putting Yeast to Work: Improving Human Health Wed. 4/12 Quantitative traits KMA Fri. 4/14 Proteomic toolbox for a model eukaryote KMA Mon. 4/17 Yeast as a model human: understanding cancer KMA Wed. 4/19 Yeast as a model human: protein-folding based diseases KMA Fri. 4/21 Catch-up & Review session GFH/KMA					
Unit 8: Putting Yeast to Work: Improving Human Health Wed. 4/12 Quantitative traits KMA Fri. 4/14 Proteomic toolbox for a model eukaryote KMA Mon. 4/17 Yeast as a model human: understanding cancer KMA Wed. 4/19 Yeast as a model human: protein-folding based diseases KMA Fri. 4/21 Catch-up & Review session GFH/KMA					
Wed.4/12Quantitative traitsKMAFri.4/14Proteomic toolbox for a model eukaryoteKMAMon.4/17Yeast as a model human: understanding cancerKMAWed.4/19Yeast as a model human: protein-folding based diseasesKMAFri.4/21Catch-up & Review sessionGFH/KMA	IVIOII.	7/10		1 (1417 (
Fri. 4/14 Proteomic toolbox for a model eukaryote KMA Mon. 4/17 Yeast as a model human: understanding cancer KMA Wed. 4/19 Yeast as a model human: protein-folding based diseases KMA Fri. 4/21 Catch-up & Review session GFH/KMA	Wed	4/12		KMA	
Mon. 4/17 Yeast as a model human: understanding cancer KMA Wed. 4/19 Yeast as a model human: protein-folding based diseases KMA Fri. 4/21 Catch-up & Review session GFH/KMA					
Wed. 4/19 Yeast as a model human: protein-folding based diseases KMA Fri. 4/21 Catch-up & Review session GFH/KMA					
Fri. 4/21 Catch-up & Review session GFH/KMA					
				2	1