		Date		Topics	Assignment (in MGB or P)
1	AS	M	1/26	Context & overview of microbial genetics and physiology; Microbial gene pool: chromosomes, plasmids, and phage	MGB Ch 1 – 4
2	AS	W	1/28	Bacterial chromosome: DNA replication initiation, termination, segregation; supercoiling and topoisomerases; cytoskeleton	MGB Ch 1
3	AS	M	2/2	Replication errors, mutations, and DNA repair; spontaneous mutations, mutator strains, mutagens;	MGB Ch 1, 3; **Post Hwk 1**
4	AS	W	2/4	DNA repair & mutagenesis; MMR	MGB Ch 10
5	AS	M	2/9	Genetic analysis I: mutant isolation (selections, screens, enrichments) and complementation (dominance vs. recessiveness)	MGB Ch 3, 14
6	SM	W	2/11	Plasmids and conjugation; transformation; mapping	MGB Ch 4, 5
7	AS	M	2/16	Genetic analysis II: Mapping by conjugation; **Paper 1**: Plasmid addiction modules	MGB Ch 14
8	KTH	W	2/18	Using chromosome duplications for complementation & other genetic tricks	
9	AS	M	2/23	Transcription: initiation and termination; polycistronic mRNA; Transcriptional regulation: repression (LexA repressor & SOS regulon)	MGB Ch 2 **Post Hwk 2**
10	AS	W	2/25	Transcriptional regulation (con't): activation (*ara* operon); Anti-sigma factors	MGB Ch 2, 11 **Hwk 1 due**
11	SM	M	3/2	Site-directed mutagenesis (+ PCR) & reverse genetics: when, why & how	MGB Ch 15 & web)
12	SM	W	3/4	Translation: initiation and termination; Rho-dependent polarity; informational and physiological suppressors; epistasis analysis	MGB Ch 2
13	AS	M	3/9	Homologous recombination I – the players (proteins and activities)	MGB Ch9 + extra reading
14	AS	W	3/11	Homologous recombination II – repair of collapsed replication forks	Extra reading
15	AS	M	3/16	**Midterm I exam**	
16	AS	W	3/18	**Paper 2** – (redundancy in gene function and synthetic lethal mutations)	**Post Hwk 3**
17	AS	M	3/23	Transposons and transposition mechanisms - IS, Tns, Mu & HIV :-)	MGB Ch 8 **Hwk 2 due**
18	AS	W	3/25	Using transposon fusions to decipher gene regulation	In-class problems
19	AS	W	3/25	Genetic problems using transposons	Extra reading
3/30 – 4/3				SPRING BREAK	
20	SM	M	4/6	Genetic exchange: lytic growth of phages, generalized transduction	MGB Ch 7
21	SM	W	4/8	Integrating regulatory mechanisms: Lysis-lysogeny decision in phage λ (anti-termination, repression, retroregulation)	MGB Ch 7, Ptashne
22	AS	M	4/13	Lysis-lysogeny decision (cont); integrating the decision with cell physiology (Hfl/FtsH and cAMP); in-class problems	MGB Ch 7, Ptashne
23	AS	W	4/15	Phenotypic conversion – toxins and other phage-encoded virulence factors – **Paper 3**	Extra reading; **Hwk 3 due**
24	AS	M	4/20	Environmental sensing via two-component regulatory systems and phosphorylation (protein-protein intrxns & two-hybrid screens); small RNAs	Extra reading
25	AS	W	4/22	Protein secretion (*sec* vs *tat*); envelope stress response (σE, Cpx, proteolysis)	Extra reading
26	AS	M	4/27	Sensing the extracellular environment: aerobic vs anaerobic growth	Extra reading
27	AS	W	4/29	Sensing the extracellular environment: biofilms & quorum sensing	Extra reading
28	AS	M	5/4	Bacterial differentiation (Bacillus)	Extra reading
29	SM	W	5/6	Bacterial evolution and competition: **Paper 4** - Roth et al., Ohno's Dilemma	Extra reading
30	AS	M	5/11	Overview and review	
31	AS	W	5/13	**Midterm II**	
32			5/18	Scheduled final (1 – 3 pm)	

AS = Prof. Anca Segall; SM = Dean Stanley Maloy; KTH = Prof. Kelly T. Hughes

Grading

Two midterm exams – 50 pts each	100 pts
Homework assignments 3 – 4	60 pts
Other (1 minute-writes, seminars attendance)	10 pts
Total points	170 pts

Grade will be calculated from a total of 150 pts!

Initially I will use a 10%/grade scale; I will curve if absolutely necessary.

Answers to all the homeworks and exams will be posted.

Not all homework problems will be graded – I will choose one or more of the problems for the complete grade (you will not know which one).

Missing exams – please don't do it. Making up exams will be possible ONLY under extreme circumstances (don't kill off your relatives just for an exam; you'll appreciate them when you need babysitting/a shoulder to cry on/to borrow money).

Late homeworks – every day late without an excuse will be docked 2 pts.

TURN OFF YOUR CELL PHONES DURING CLASS, UNLESS IN AN EMERGENCY SITUATION.

OFFICE HOURS: Mondays after class until 4:15 pm AND by appointment.