Chapter 1

- Applications
- Unifying principle
- Genome
- Model genetic organisms
- History
  - Pangenesis
  - Preformation
- Cell Theory
- Basic Concepts in Genetics

Chapter 2

- Basic Cell Types
- Binary fission
- Eukaryotic chromosomes
  - Terms & structure
- Cell Cycle
  - Phases
- Mitosis
- Meiosis

Chapter 3

- Mendel
- Terms
- Monohybrid crosses
- Principle of Segregation
- Multiplication rule
- Addition rule
- Binomial expansion
- Testcross
- Dihybrid crosses
- Principle of Independent assortment
- Goodness-of-Fit Chi-Square Test

Final Exam
Aprox. 100 pts
Exam will cover chapters 1-16 & 18
You may use page of notes (one side)

Chapter 4

- Terms
- Nondisjunction
  - Results
- Sex linked cross
- Barr body

Chapter 5

- Incomplete dominance
- Codominance
- Penetrance
- Lethal alleles
- Multiple alleles
- Epistasis
  - Recessive
  - Dominant
  - Duplicate recessive
- Maternal effects
- Eigenetics
- Environmental effects

Chapter 7

- Linked genes
- Recombinant frequency
- Predicting outcomes
- Testing for independent assortment
- Genetic Maps
- Physical maps
  - Two point cross
  - Three point cross

Chapter 6

- Pedigree charts
- Genetic testing

Chapter 8

- Protrophic
- Axotrophs
- Plasmids
  - Episomes
    - F factor
- Conjugation
  - Mapping
- Transformation
- Transduction
- Lytic & Lysogenic
- Retroviruses

Chapter 9

- Chromosome rearrangements
  - Duplications
  - Deletions
  - Inversions
  - Translocations
- Aneuploidy
- Downs syndrome
- Polyploidy
- Problems

Chapter 10

- Characteristics of Genetic Material
- Fred Griffith
  - transforming principle
- Oswald Avery
  - Identification of principle
- Watson & Crick
- Rosalind Franklin
- Structure of DNA
  - Recognize/identify
- DNA & RNA
  - Similarity/differences
- Central Dogma of molecular biology

Chapter 11

- Negative supercoiling
- Chromatin
- Histones
- Artificial chromosomes
- Transposable elements
  - Barbara McClintock

Chapter 12

- Semi conservative replication
  - Theta replication
  - Rolling-circle
  - Linear eukaryotic
- DNA polymerase
  - 5'→ 3'
- replication fork
  - Leading strand
  - Lagging strand
- Stages of replication
- Primase
- DNA polymerase III
  - Proofreading
- DNA Ligase
- Mismatch repair

Chapter 18

- Importance of mutation
- Somatic
- Germ-line
- Base Substitutions
  - Transition
  - Transversion
- Insertions & deletions
  - Frameshift mutations
  - In-frame insertions/deletions
- Missence
- Nonsense
- Silent
- DNA Repair
  - Proofreading
  - Mismatch Repair
  - Direct Repair
  - Base-Excision Repair
  - Nucleotide-Excision Repair

Chapter 13

- Central Dogma
- RNA
  - rRNA
  - mRNA
  - tRNA
  - Pre-mRNA
- Template strand
- Transcription unit
- Transcription
  - Prokaryotic & Eukaryotic
    - Initiation
    - Elongation
    - Termination

Chapter 14

- Gene Structure
- Exons
- Introns
- Codon
- Bacterial cells
  - Simultaneous
- Eukaryotic cells
  - Splicing
  - Messenger RNA
  - regions of mRNA
- Ribosome

Chapter 16

- Lac operon
- Catabolite repression
- Negative
  - Inducible & repressible
- Positive
  - Inducible & repressible

Chapter 15

- Proteins
  - Functions
  - Amino acids
  - peptide bonds
- Genetic Code
- Degenerate & Wobble
- Reading frame
- Termination codons
- Ribosome
- Stages (prok & euk)
  - tRNA charging
  - Elongation
  - Termination
- Bacteria/Eukaryotic
- Consensus sequence/5 cap
- Polyribosomes
- Molecular chaperones