

BIOL 1520 Principles of Biology II Syllabus

PREREQUISITES: BIOL 1510, Principles of Biology I

COURSE DESCRIPTION :

This course builds on the concepts introduced in BIOL 1510 Principles of Biology I. It provides an overview of the structural and functional characteristics of animals and plants and the basic concepts of ecology. This course introduces the major animal and plant phyla and examines their taxonomic, evolutionary, and organizational relationships, and their life cycles. Additional topics include animal tissues, organs, and organ systems; the structure and function of vascular plants; and ecology. This course has both a lecture and laboratory component. This course and BIOL 1510 provide a general introduction to the biological sciences for the science major.

RATIONALE FOR COURSE: This course and BIOL 1510, Principles of Biology I, provide a general introduction to the biological sciences for the science major. This course is a core course for biology majors and an elective course fulfilling some of the requirements for an A.A. or A.S. degree or for transfer to a baccalaureate program at most colleges or universities.

Texts: *Biology* By E. P. Solomon, L. R. Berg, and D. W. Martin for Biology 1520 (split of 8th ed) Thompson Publishing 2008 - Full 7th or 8th edition can be used.

Note: Several chapters from the Biology 1510 volume will be revisited in Biol 1520.

Laboratory Manual for General Biology Biol 1520 (from the 5th ed) by J. W. Perry, D. Morton, and J. B. Perry, Thompson 2008 (Full 2007 5th edition or 2002 edition can be used)

BIOL 1520 Principles of Biology II
Lecture Topic Outline

Week 1

I. The Animal Kingdom

A. Classification and Phylogeny of Animals

1. Animals defined, Ch. 1, pp. 10 - 11 (1510); Ch. 23, pp. 484 - 487 (1510); Ch. 29, pp. 619 - 620.
2. Animal Origins Ch. 21, pp. 455 - 463 (1510). Ch. 25, p. 551 (1510), Ch. 29, pp. 621 -622.
3. Diversity and Classification (Review from BIOL 1510) Ch. 1, pp. 9 - 11; Ch. 23, pp. 482 - 497.

B. Animal Body plans

1. Levels of organization (review: cellular, tissue, organ or organ system) Ch. 1, pp. 6 - 7.
2. Major Anatomical Features Ch. 29, pp. 619 - 627. (including tissue layers, symmetry , segmentation (metamerism), and cephalization; type of digestive tract; Body Cavity; Invertebrate vs. Vertebrate; and developmental patterns: spiral vs. radial cleavage, determinate vs. indeterminate cleavage, shizocoelous vs. enterocoelous, Protostome vs. Deuterostome.

C. Major Taxonomic Groups and Evolutionary relationships - (Examples of the major animal Phyla will be studied in more detail in the laboratory). Appendix B

1. Parazoa - Porifera - Ch. 29, pp. 628 - 631.
2. Radiata - Radial Symmetry - Cnideria and Ctenophorans - pp. 631 - 636.
Summary and Review Ch. 29, pp. 637 - 639
3. Protostomes
 - a. Lophotrochozoa Chapter 30, pp. 640 - 641
 1. Acoelomates - Platyhelminths - Ch. 30 pp. 641 - 643.

Week 2

2. Rhyncocoels - Nemertea - p. 643
3. Pseudocoelomates - Rotifera - pp. 653 - 654
4. Eucoelomates
 - Mollusca pp. 644 - 649
 - Annelida pp. 649 - 652.
 - Lophophorates (Brachiopoda, Phoronida, Brachiopoda) pp. 652 - 653.

b. Ecdysozoa

1. Pseudocoelomates - Nematoda pp. 654 - 655
 2. Eucoelomates - Arthropods - pp. 655 - 664.
- Chapter 29 Summary and Review pp. 664 - 666.

Week 3

5. Deuterostomes - Ch. 31, pp. 667 - 668.
Eucoelomates
 1. Echinoderms and Hemichordates - Ch. 31, pp. 668 - 671.
 2. Chordates and Vertebrates - pp. 671 - 694; Thermoregulation Ch. 38 pp. 822 - 824.

Chapter 31 Summary and Review pp. 695 - 697.

Week 4

- D. Complex animal organization as exemplified by the Vertebrates
(The structures of vertebrates will be compared and contrasted with those found in the major invertebrate groups referring back to Chapters. 29 - 31 as necessary.)
1. Vertebrate Tissues and summary of organ systems. Ch. 50. pp. 1087 - 1089 (Gastrulation, germinal tissues, 1510); Chapter 38, pp. 807 - 822 . Summary and Review, pp. 824 - 826.
 2. Integumentary Systems (Skin) Chapter 39, pp. 827 - 829.

Week 5

3. Skeletal Systems pp. 829 - 833.
4. Muscles pp. 833 - 842. Summary and Review pp. 842 - 844.
5. Respiratory systems Chapter 45, pp. 970 - 985. Summary and review pp. 985 - 987.

Week 6

6. Nutrition and Digestion Chapter 46, pp. 989 - 1007. Summary and Review pp. 1007 - 1009.

Week 7

7. Circulatory systems Chapter 43, pp. 919 - 938. (Structure of the heart detailed in lab)
8. Lymphatic system p. 938 - 940. Summary and Review pp. 940 - 943.

Week 8

9. Nervous Tissue (Neural Signaling) Chapter 40, pp. 845 - 861.
Summary and review pp. 862 - 864.
10. Nervous System (Neural Regulation) Ch. 41, pp. 865 - 889. (Brain structure and function detailed in lab). Summary and review pp. 890 - 892.
11. Sensory Reception Chapter 42, pp. 893 - 903, 906 - 910. Summary and Review pp. 915 - 918.
12. Endocrine Regulation Chapter 48, pp. 1028 - 1047. Summary and review pp. 1047 - 1050.

Week 9

13. Osmoregulatory and Excretory systems Chapter 47, pp. 1011 - 1025.
Summary and review pp. 1025 - 1027.
14. Reproductive systems Chapter 49, pp. 1051 - 1076. Summary and Review pp. 1076 - 1079.
15. Human Development Chapter 50, pp. 1091 - 1098. Summary and Review pp. 1098 - 1100.

Week 10

II. The Plant Kingdom

- A. Classification and Phylogeny of Plants Ch. 27, pp. 581 - 584; Appendix B
- B. Seedless Plants
 1. Non-vascular Plants - Bryophytes (mosses and liverworts) - pp. 584 - 589.
 2. Vascular Plants, ferns and allies - pp. 589 - 597. Summary and review pp. 597 - 599.

Week 11

- C. Vascular Plants / Seed Plants

1. Gymnosperms Chapter 28 pp. 600 - 607.
2. Flowering Plants - Angiosperms pp. 607 - 616. Summary and Review pp. 617 - 618.

Week 12

D. Plant Biology - Vascular plant structure, Growth, and differentiation

1. Diversity in plant structure and flowering patterns Ch. 32, pp. 698 - 700.
2. Generalized plant Structure p. 700 - 702
3. Fundamental Plant Tissues 702 - 711
4. Primary and Secondary Growth pp. 711 - 712. Summary and Review pp. 712 - 714.
5. Roots and Mineral Nutrition Chapter 35, pp. 748 - 764. Summary and Review pp. 764 - 766.
6. Stems and Transport in plants Chapter 34, pp. 731 - 744. Summary and Review pp. 744 - 747.

Week 13

7. Leaf structure and function Ch. 33, pp. 715 - 728. Summary and Review pp. 728 - 730.
 - A. Photosynthesis Chapter 9 and Cellular Respiration Chapter 8 (review from 1510)
8. Reproduction in Flowering Plants Chapter 36, pp. 767 - 786 .
Summary and Review pp. 786 - 788.

Week 14

9. Plant Growth, Development, and Responses. Chapter 37, pp. 789 - 804.
Summary and Review pp. 804 - 806.

III. Ecology

- A. Population Ecology Ch. 52, pp. 1126 - 1143. Summary and Review pp. 1143 - 1145.
- B. Community ecology Ch. 53, pp. 1146 - 1163. Summary and Review pp. 1163 - 1165.
 1. Community structure
 2. Niche
 3. Succession

Week 15

- C. Ecosystems and The Biosphere Chapter 54, pp. 1166 - 1186.
Summary and Review pp. 1186 - 1188
 1. Energy Flow and trophic levels
 2. Biogeochemical Cycles: water, carbon, nitrogen, phosphorous.
 3. Abiotic factors.
- D. Ecology and Geography of Life (Biomes and Aquatic Ecosystems) Ch. 55, pp. 1189 - 1209. Summary and Review pp. 1209 - 1211.
 1. Habitat characteristics and climates
 2. Major Biomes
 3. Aquatic ecosystems
- E. Global Environmental Issues Chapter 56, pp. 1212 - 1231. (Time Permitting)
Summary and Review pp. 1231 - 1234.

Week 16

Final Exam