

Dr. Rider's Laboratory at Voyagers

Human Anatomy and Physiology

Mondays 10:30-Noon Spring 2019

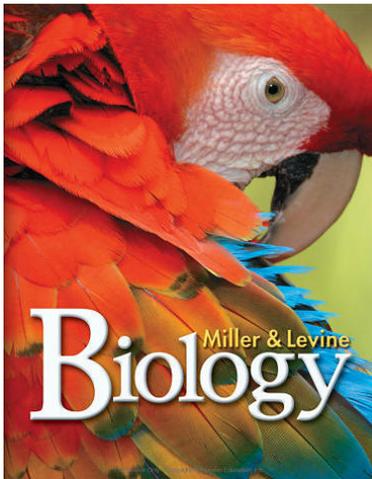
\$390 members/\$440 nonmembers

Chelmsford, MA voyagersinc.org

Dr. Todd H. Rider, thor@riderinstitute.org



This course will cover human anatomy, physiology, disease, diagnostics, and therapeutics. **No prior knowledge is required—new students are very welcome to join.** Each class will have short lectures but will mainly focus on hands-on lab activities using high-quality microscopes, centrifuges, DNA analysis gels, and other professional laboratory equipment. It is recommended (though not required) that students buy a biology textbook for supplementary readings during each week. Students can use **either** Miller & Levine's *Biology* **or** Campbell *Biology*:



For younger/less
experienced
students:

Macaw edition
(2010
or later)

or

Dragonfly
edition (2005)

OR

For older/more
experienced
students:

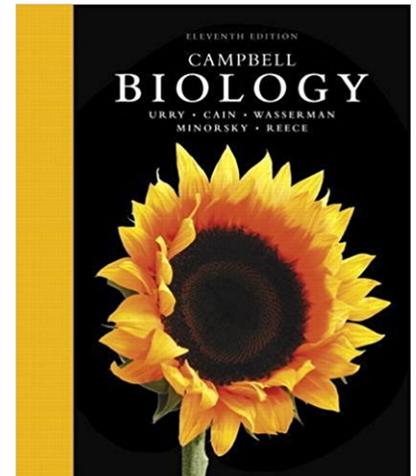
11th ed. (2016)

or

10th ed. (2013)

or

9th ed. (2010)



<u>Date</u>	<u>Topic</u>	<u>Campbell</u>	<u>or</u>	<u>Miller & Levine</u>
1/28	Endocrinology	Ch. 45		Endocrine System/Glands
2/4	Endocrinology	Ch. 45		Endocrine System/Glands
2/11	Neuroscience	Ch. 48		Nervous System
2/18	[No class—school vacation week]			
2/25	Neuroscience	Ch. 49, 51		Nervous System
3/4	Sensory systems	Ch. 50		Senses
3/11	Sensory systems	Ch. 50		Senses
3/18	Motor systems	Ch. 50		Muscular System/Skeletal System
3/25	Motor systems	Ch. 50		Muscular System/Skeletal System
4/1	Immunology	Ch. 43		Immune System and Disease
4/8	Immunology	Ch. 43		Immune System and Disease
4/15	[No class—school vacation week]			
4/22	Developmental biology	Ch. 46		Reproduction/Fertilization/Development
4/29	Developmental biology	Ch. 47		Reproduction/Fertilization/Development
5/6	[No class—available for makeup if necessary]			

Note: Chapter numbers differ widely among different editions of Miller & Levine, so the right column lists them by their topics, not their numbers. Chapter numbers can also vary in some editions of Campbell, so always verify that the chapter's topic matches the intended topic.

New textbooks are insanely expensive, but more affordable used copies are available from online dealers at amazon.com, abebooks.com, etc. Students can also save money (without losing much scientific content) by buying an edition that is recent but not the very latest edition. Dr. Rider will bring copies of the textbooks to the first class if you would like to examine them before deciding which one to order. He can suggest free information sources online for those who prefer not to buy a book.

Students are encouraged to pursue their own independent studies or science fair projects outside of the course. Dr. Rider is happy to offer suggestions or advice. Some useful books on setting up a home lab are:

Raymond E. Barrett & Windell H. Oskay, *The Annotated Build-It-Yourself Science Laboratory* (2015)

Robert Bruce Thompson, *Illustrated Guide to Home Biology Experiments* (2012)

William Berman, *How to Dissect* (4th ed., 1984)

James D. Witherspoon, *From Field to Lab* (1993)

A good source of supplies for setting up a home lab is:

www.homesciencetools.com

(Wide range of supplies; ignore the creationist books)

Information on upcoming science fairs and previous winning projects is available at:

www.societyforscience.org

About the instructor:

Dr. Todd H. Rider received his Ph.D. from MIT, and his research has been featured in magazines ranging from *Science* to *Time* and on TV programs from NBC's Nightly News to BBC's Horizon. In biology research, he invented and developed the CANARY sensor, which uses genetically engineered white blood cells to rapidly identify bacteria, viruses, and other pathogens. Dr. Rider also invented the DRACO broad-spectrum antiviral therapeutics and demonstrated that they are safe and effective against 18 different viruses in cells and 4 viruses in mice. In physics research, he discovered fundamental physical limitations on nuclear fusion reactors, analyzed antimatter rocket engines, and demonstrated methods to combine numerous laser beams to form more powerful laser beams. He created the K-12 Science on Saturday program at MIT and has over 25 years of experience teaching biology, chemistry, physics, earth science, engineering, and archaeology courses to students at all levels. He is currently working on his plan for world domination.

