



Learning Outcomes for the Biology Pre-Dental Concentration

Lower Division Courses

Lower division elective learning outcomes

- Learn foundational core scientific concepts in biology, chemistry, and physics to become biologically literate. These core concepts are evolution, structure & function, information flow, exchange and storage, pathways and transformations of energy and matter, and systems (recommended by the American Association for the Advancement of Sciences).
- Learn mathematical concepts utilized in the biological sciences.
- Learn the process of science through problem solving and data interpretation. This involves the ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
- Develop communication skills.
- Understand the interdisciplinary nature of science.
- Understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.
- Function effectively on teams to solve problems.

Required lower division courses (see Biology major checklist or UG Bulletin for courses)

Biology (20 hrs)

Chemistry (16 hrs)

Physics (8 hrs)

Mathematics (7 hrs)

Additional required lower division course

ENGL 1301 & 1302 (combination of two writing courses)

Upper Division Courses

Upper division elective learning outcomes

- Learn foundational course content needed to apply to dental programs.
- Exposure to diverse coursework to broaden students' thought processes so they can approach and deal with different topics and problems.
- An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science to areas relevant to the discipline.
- Develop independent inquiry and problem-solving skills.
- Develop communication skills.
- Understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.

Required upper division courses for a few dental schools

The pre-requisite course is indicated in parentheses along with the upper division core designation.

_____ BIOL 3406 Structure and Function of the Human Body I (BIOL 1440) *

_____ BIOL 3407 Structure and Function of the Human Body II (BIOL 3406) *

* BIOL 3406/07 does not normally count toward Biology elective credit hours, but is required for entrance into some dental programs. However, upon completion of BIOL 3407 the Dept will authorize that it counts toward 4 upper division Biology elective credit hours; this is done AFTER the successful submission of the student's



application to dental school. You must document that the school you apply to requires the two A&P courses. See the Dental Advisory Committee Chair for details.

Recommended upper division courses

All upper division biology electives have Genetics (BIOL 2490) as a pre-requisite. The pre-requisite course is indicated in parentheses along with the upper division core designation, if applicable. These courses are just suggestions; you can still select from **ALL** the upper division biology elective course offerings listed in the UG Bulletin. Courses in **BOLD** are highly suggested (but, not required) by the UCA Pre-Dental Advisory Committee.

- _____ BIOL 3310 Neuroethology: The Neural Basis of Natural Behaviors
- _____ **BIOL 3420 General Microbiology**
- _____ BIOL 4340 Immunology (BIOL 3402)
- _____ **BIOL 4405 Developmental Biology (BIOL 3402)**
- _____ BIOL 4414 Molecular Mechanisms of Aging (BIOL 3402) [UD UCA Core: Z]
- _____ BIOL 4421 Pathogenic Microbiology (BIOL 3402) [UD UCA Core: Z]
- _____ BIOL 4425 Experimental Neurobiology (CHEM 1450/PHYS 1420) [UD Core: Z]
- _____ BIOL 4311 Pathophysiology (BIOL 2405 or 3407 or 4460)
- _____ BIOL 4320 Neurodevelopment and Pathology
- _____ BIOL 4360 Endocrinology (BIOL 3402)
- _____ **BIOL 4430 Comparative Vertebrate Anatomy**
- _____ **BIOL 4460 Animal Physiology (BIOL 3402)**
- _____ **BIOL 4400 Histology (BIOL 3402)**
- _____ BIOL 3410 Vertebrate Zoology
- _____ BIOL 4406 Mammalogy (BIOL 3402, recommended BIOL 3410 or 4415)
- _____ BIOL 4418 Biology of the Reptilia (BIOL 3403)
- _____ BIOL 4461 Parasitology
- _____ BIOL 4415 Evolution
- _____ BIOL 4435 Animal Behavior (CHEM 1451, MATH 2311) [UD UCA Core: Z]
- _____ **CHEM 4320/4121 Biochemistry I & Lab (CHEM 3411)**
- _____ BIOL 4445 Biometry (MATH 2311)
- _____ BIOL 3V50/4V55 Independent Study
- _____ BIOL 3V45 Internship
- _____ BIOL 4V85 Undergraduate Research [UD UCA Core: Z]
- _____ BIOL 4V90 Special Topics in Biology: TBD

Non-academic Competencies

- Compassion & empathy
- Time management
- Responsibility
- Curiosity
- Socio, economic, and cultural competence
- Humility
- Respect differences
- Integrity

Some of these trait competencies are folded into biology courses. However, you will need to find opportunities to discover (and develop) how these traits incorporate you as a unique individual. Courses in other disciplines, such as psychology, communications, sociology, and a foreign language may be helpful.



Health Care Experience

It is suggested that you observe/shadow in several different types of dental offices such as general dentists (required by all schools) and specialists. You should log a minimum of 100 observation hours in a dental clinic.