

# DEPARTMENT OF BIOLOGY

The Department of Biology offers one graduate degree, the Masters of Science in Biology. This degree is primarily designed to:

1. Prepare students who will seek further advanced (e.g., Doctor of Philosophy (Ph.D.) degrees in related areas of research specialization in the biological sciences.
2. Prepare those who wish to teach biology in public and private schools and two- and four-year colleges and universities.
3. In collaboration with the Department of Curriculum and Instruction, prepare teachers interested in achieving professional certification for teacher of biology at the secondary school level.
4. Prepare those who wish to seek career advancement in government, industry and related areas with applicable, research-based credentials.

In summary, this program is designed to provide instructional enhancement to meet the needs of teachers, practitioners, and others who wish to supplement their undergraduate education and expand their research capabilities in biology through study beyond the master's degree.

- Biology, Master of Science (<https://catalog.tsu.edu/graduate/schools-colleges/science-engineering-technology/biology/biology-ms/>)

## Advanced Undergraduate/Graduate

### BIOL 452 Intermediary Cellular Metabol (3 Credits)

Intermediary and Cellular Metabolism (3) Quantitative bioenergetics; patterns of breakdown and synthesis of cellular metabolite; metabolic and hormonal regulations; integration and pathological disorders; and relevance of metabolism to medicine. Three hours of lecture per week. Prerequisite: BIOL 340.

**Prerequisite(s):** BIOL 340

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## Graduate

### BIOL 526 Topics In Biology (3 Credits)

Topics in Biology (3) Discussion of published papers covering a broad spectrum of biological disciplines. Three (3) hours of lecture a week. (Prerequisite: Graduate standing in biology, chemistry or toxicology).

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### BIOL 527 Adv Plant Physiology (3 Credits)

Advanced Plant Physiology (3) Consideration of the chemistry and biochemistry of plant growth and development with emphasis on growth regulators, plant mineral nutrition, nitrogen-fixation, photosynthesis and photoperiodism. Three (3) hours of lecture a week. (Prerequisite: Graduate standing in biology, chemistry or toxicology).

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### BIOL 528 Hist Of Sciences (2 Credits)

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### BIOL 534 Entomology (3 Credits)

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### BIOL 534L Entomology Lab (0 Credits)

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### BIOL 623 Neurobiology (3 Credits)

Neurobiology (3) Structure and function of the brain and of the nervous system as a whole with emphasis on cellular and molecular mechanisms. Lectures, discussion, student reports. Three (3) hours of lecture per week. (Prerequisite: Graduate standing in biology)

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### BIOL 631 Diagnostic Bacteriology (3 Credits)

Diagnostic Bacteriology (3) Fundamental training in isolation and identification of microorganisms obtained from a clinical laboratory specimen. One (1) hour of lecture per week and two (2) three-hour laboratory classes. (Prerequisite: BIOL 347)

**Prerequisite(s):** (BIOL 347)

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### BIOL 631L Diag Bact Lab (0 Credits)

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### BIOL 636 Endocrinology (3 Credits)

Endocrinology (3) Through lectures and discussions an examination of the glands of internal secretion with special reference to humans. Three (3) hours of lecture per week. (Prerequisite: Graduate standing in biology)

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### BIOL 645 Animals In Biomed Research (4 Credits)

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### BIOL 645L Animals Biomed Res Lab (0 Credits)

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### BIOL 647 Experimental Biology (4 Credits)

Experimental Biology I (4) Current topics in biological research utilizing published literature as lecture material and as the basis for student presentations and experimentation. One (1) hour of lecture and four (4) hours of laboratory a week. (Prerequisite: Graduate standing in biology.)

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### BIOL 647L Experimental Biol Lab (0 Credits)

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### BIOL 648 Experimental Biology (4 Credits)

Experimental Biology II (4) A continuation of Biology 647, emphasizing the application of modern biological, chemical and physical methods to the study of the biological sciences. One (1) hour of lecture and four (4) hours of laboratory a week. (Prerequisite: Graduate standing in biology)

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### BIOL 648L Experimental Biol Lab (0 Credits)

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**BIOL 650 Enzymology (3 Credits)**

Enzymology (3) A study of enzyme classification, structure, kinetic models, rapid and relaxation kinetics for complex enzyme mechanisms. Three (3) hours of lecture. (Prerequisite: Graduate standing in biology)

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**BIOL 710 Microbial Genetics (3 Credits)**

Microbial Genetics (3) An examination of the nature, expression and regulation of the genetic process in microorganisms. Three (3) hours of lecture a week; (Prerequisite: Graduate standing in biology).

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**BIOL 712 Biosynthetic Mech (3 Credits)**

Biosynthetic Mechanisms (3) Molecular processes involved in the DNA function, biosynthesis replication, translation, transcription; biochemical mechanisms in RNA synthesis and protein biosynthesis. Molecular aspects of evolution and carcinogenesis. Three (3) hours of lecture a week. (Prerequisite: Graduate standing in biology)

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**BIOL 715 Advanced Human Genetics (3 Credits)**

Advanced Human Genetics (3) Comprehensive treatment of various normal aspects of human heredity as well as those aspects due to abnormal inheritance causing malfunctioning in metabolism. Three (3) hours of lecture a week. (Prerequisite: Graduate standing in biology)

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**BIOL 725 Biochemical Ecology (3 Credits)**

Biochemical Ecology (3) An advanced in depth biochemical study of structure and function of ecosystems and of their changes due to natural and anthropogenic causes. Three (3) hours of lecture a week. (Prerequisite: Graduate standing in biology, chemistry, or toxicology)

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**BIOL 735 Tech in Electron Microscopy (4 Credits)**

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**BIOL 775 Bio-Organic Chemistry (3 Credits)**

Bio-Organic Chemistry (3) A comprehensive treatment of the structure and function of various organic compounds occurring in living organisms. Three (3) hours of lecture a week. (Prerequisite: Graduate standing in biology, chemistry, or toxicology)

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**BIOL 777 Biophysics (3 Credits)**

Biophysics (3) A comprehensive treatment of the concepts in physics and physical chemistry as applicable to biological systems. Three (3) hours of lecture a week. (Prerequisite: Graduate standing in biology or chemistry)

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**BIOL 785 Adv Plant Physic & Biochem (3 Credits)**

Advanced Plant Physiology and Plant Biochemistry (3) An indepth treatment of photosynthesis, photoperiodism, nitrogen-fixation and plant molecular biology. Three (3) hours of lecture a week. (Prerequisite: Graduate standing in biology)

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**BIOL 795 Graduate Biology Seminar (3 Credits)**

Graduate Biology Seminar (3) Review and indepth critical discussion of current published papers in selected areas of biological and biochemical sciences. Three (3) hours of presentation a week. (Prerequisite: Graduate standing in biology, chemistry, or toxicology)

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**BIOL 861 Research Problems I (3 Credits)**

Research Problems (3) An individual investigation of a specific research problem in biological sciences through literature search and laboratory experimentation. Consent of the Department. Supervised by members of the Graduate Faculty.

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**BIOL 862 Research Problems II (3 Credits)**

Research Problems II (3) A continuation of BIOL 861. Required of all candidates for the degree of Master of Science in Biology. An individual investigation of a specific research problem in biological sciences through literature search and laboratory experimentation. Consent of the Department. Supervised by members of the Graduate Faculty. (Prerequisite: BIOL 861).

**Prerequisite(s):** (BIOL 861)

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