

DEPARTMENT OF CHEMISTRY AND PHYSICS

Sandra Barnes, Ph.D., Department Chairperson
Math and Science Building, 2nd Floor
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Phone: 601-877-6436 FAX: 601-877-6695

Degree Offered

Secondary Education Masters: Chemistry

Requirement for Admission

Standard Educator License

Graduate Faculty

Sandra Barnes, Ph.D., Department Chairperson and Associate Professor of Chemistry

Yolanda Jones, Ph.D., Associate Professor of Chemistry

Anant Singh, Ph.D., Assistant Professor of Physics

ENDORSEMENT AREA: CHEMISTRY EDUCATION

Program Description

The Department of Chemistry and Physics offers an “AA” endorsement in chemistry as a part of the Master of Science in Education degree in Secondary Education. In this program, a student has the option to become certified in a combination of chemistry and the physical science areas. The area objectives for chemistry education are to:

1. provide for all students a basic and broad knowledge of chemistry necessary for a career in secondary education;
2. offer courses leading to certification in chemistry and the physical sciences;
3. offer courses leading to a Master of Science in Education degree in Secondary Education with “AA” endorsement in Chemistry;
4. offer instruction on the most modern theories of learning and behavior;
5. offer courses in modern methodologies of instruction at the secondary level;
6. prepare teachers for scholarship, service, and leadership in the area of general and applied knowledge;
7. provide curricula in teacher training which responds to the demands of a dynamic democratic society;
8. provide a graduate education program which enables students to obtain advanced training in specialized fields and to contribute to the advancement of knowledge and new truths through scholarly research and inquiry.

Course Requirements

Core Education Courses (12 hours)

Credits

ED 512	Foundations of American Research	3 hrs.
ED 514	Methods of Educational Research	3 hrs.
ED 533	Curriculum Development	3 hrs.
PH 513	Advanced Educational Psychology	3 hrs.

Required Courses* (15 hours)		Credits
CH 510	Development of Modern Chemistry	3 hrs.
CH 550	Analytical Methods	3 hrs.
CH 560	Selected Topics in Chemistry	3 hrs.
CH 585	Principles of Chemistry for Teachers	3 hrs.
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Electives* (6 hours)		Credits
CH 500	Science and Environment	3 hrs.
CH 506	Astronomy	3 hrs.
CH 520	Advanced Inorganic Laboratory	3 hrs.
CH 530	Advanced Inorganic Chemistry	3 hrs.
CH 540	Advanced Organic Chemistry	3 hrs.
CH 570	Modern Theoretical Chemistry	3 hrs.
GS 503	Earth and Space Science	3 hrs.
GS 511	Nuclear Science	3 hrs.
GS 580	Advanced Biochemistry	3 hrs.
TOTAL		33 hrs.

*The specific required and elective courses will be determined on an individual basis by each student's advisory committee in accordance with the student's preparation and needs.

Chemistry Course Descriptions (CH)

CH 510 – DEVELOPMENT OF MODERN CHEMISTRY

(3 Credits)

A survey of the development of chemical theories from the chemical revolution to the present.

CH 520 – ADVANCED INORGANIC LABORATORY

(3 Credits)

An advanced laboratory course dealing with preparation, purification, and characterization of inorganic compounds.

CH 530 – ADVANCED INORGANIC CHEMISTRY

(3 Credits)

The descriptive chemistry of the main group elements and reaction mechanisms of coordination compounds.

CH 540 – ADVANCED ORGANIC CHEMISTRY

(3 Credits)

Reaction mechanisms and structures of organic compounds.

CH 550 – ANALYTICAL METHODS

(3 Credits)

Theory and methodology of instrumentation and various techniques of chemical analysis.

CH 560 – SELECTED TOPICS IN CHEMISTRY

(3 Credits)

A study of specialized topics in various areas of chemistry.

CH 570 – MODERN THEORETICAL CHEMISTRY

(3 Credits)

An introduction to the basic principles of quantum mechanics as applied to chemistry.

CH 585 – PRINCIPLES OF CHEMISTRY FOR TEACHERS I

(3 Credits)

A course designed for in-service teachers. An investigation of the main concepts of the five major areas of chemistry with emphasis on those concepts involved in the teaching of secondary school chemistry. A strenuous laboratory is involved to relate chemical principles to laboratory activity.

CH 586 – PRINCIPLES OF CHEMISTRY FOR TEACHERS II

(3 Credits)

A continuation of CH 585.

ENDORSEMENT AREA: SCIENCE EDUCATION

Degree Offered

Secondary Education Masters: Science

Requirement for Admission

Standard Educator License

Program Description

The Department of Chemistry and Physics offers an “AA” endorsement in Science Education as part of a Master of Science in Education degree in Secondary Education. In this endorsement, a student has the option to become certified in a combination of physical and biological sciences or may choose heavy emphasis in the physical science area. The area objectives for general science are to:

1. provide for all students a basic and broad knowledge of the physical sciences necessary for a career in secondary education;
2. offer courses leading to certification in the physical sciences in the areas of general sciences, physical science, and earth and space science;
3. offer courses leading to a Master of Science in Education degree in Secondary Education with “AA” endorsement in one or more areas of physical science.

Course Requirements

Core Education Courses (12 hours) Credits

ED 512	Foundations of American Research	3 hrs.
ED 514	Methods of Educational Research	3 hrs.
ED 533	Curriculum Development	3 hrs.
PH 513	Advanced Educational Psychology	3 hrs.

Required Courses (15 hours) Credits

GS 500	Science and the Environment	3 hrs.
GS 503	Earth and Space Science	3 hrs.
GS 506	Astronomy	3 hrs.
GS 511	Nuclear Science	3 hrs.
GS 585	Methods of Teaching Science	3 hrs.

Electives (6 hours) Credits

BI 547	Field Biology and Ecology	3 hrs.
CH 580	Advanced Biochemistry	3 hrs.
CH 585	Principles of Chemistry for Teachers	3 hrs.

GS 501	Earth Science	3 hrs.
GS 504	Radiation Chemistry and Biology	3 hrs.
GS 505	Atmospheric Science	3 hrs.
GS 550	Research and Thesis	6 hrs.
GS 560	Problems in General Science	3 hrs.
TOTAL		33 hrs.

General Science Course Descriptions (GS)

GS 500 – SCIENCE AND ENVIRONMENT

(3 Credits)

A study designed to forge a crucial link between chemical and biological principles and the natural environment. Current problems dealing with air, water, and soil pollution are stressed.

GS 501 – EARTH SCIENCE

(3 Credits)

An integrated course which intends to stress the relationships between energy, traditional earth science topics, and the three spheres comprising our environment. The origin of the atmosphere, structure of the earth, energy resources and consumption and selected geological content are major topics in the course.

GS 502 – GENERAL SCIENCE SEMINAR

(3 Credits)

Discussion of current periodicals, books and research reports in the natural sciences.

GS 503 – EARTH AND SPACE SCIENCE

(3 Credits)

An introductory survey course on the basic concepts of astronomy, meteorology, and geology. Additional topics are selectively treated from the areas of chemistry and physics to develop and broaden an understanding of the chemical and physical forces influencing the quality of life on earth.

GS 504 – RADIATION CHEMISTRY AND BIOLOGY

(3 Credits)

A study of the types, sources and measurement of radiation and the chemical changes induced by these radiations especially as they affect biological systems.

GS 505 – ATMOSPHERIC SCIENCE

(3 Credits)

A study of the physical characteristics of the atmosphere. The course will stress the use of instruments, computer assisted methods and building equipment suitable for atmospheric studies. Pre-requisite: PY 112.

GS 506 – ASTRONOMY

(3 Credits)

A basic course on the origin and nature of planets, stars, galaxies; to include also a description of techniques and equipment used to study outer space.

Pre-requisite: PY 112.

GS 510 – SPECIAL TOPICS IN GENERAL SCIENCE

(3 Credits)

This course is a series of four two-hour credit mini courses. The complete series consists of four mini courses for a total of eight credit hours. A student may elect any one or more of the mini courses and earn from two to a maximum of eight credits.

GS 511 – NUCLEAR SCIENCE

(3 Credits)

Basic concepts on nuclear reactions, nuclear energy, use of nuclear energy and problems of waste and storage. Pre-requisite: PY 111.

GS 550 – RESEARCH AND THESIS

(6 Credits)

The completion of a research project under the direction of an advisor and the preparation of a thesis incorporating the results. An oral defense of the thesis will be required.

GS 560 – PROBLEMS IN GENERAL SCIENCE

(3 Credits)

Selected problems involving descriptive or experimental research with special emphasis or interdisciplinary approaches to these problems.

GS 594 – GENERAL SCIENCE FOR ELEMENTARY SCIENCE TEACHERS

(3 Credits)

This course is designed expressly for in-service elementary science teachers, and is restricted to those teachers having a National Science Foundation Grant, or to persons with written permission of the instructor. The course will deal with Science Curriculum Improvement Study (SCIS) materials along with other selected topics from biological and physical sciences for the enlightenment of the in-service teachers to certain scientific principles.

GS 595 – GENERAL SCIENCE FOR ELEMENTARY SCIENCE TEACHERS

(3 Credits)

A continuation of 594. Teachers who have participated in the elementary science teacher program will be visited six times per semester in the individual classroom by staff members. They will participate in two Saturday seminars each semester

GS 596 – GENERAL SCIENCE FOR ELEMENTARY SCIENCE TEACHERS

(1 Credit)

A continuation of GS 595.