MASTER OF EDUCATION IN GENERAL SCIENCE

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The Master of Education (M.Ed.) degree with a specialty area in General Science (biology, physics, or chemistry) requires a minimum of 36 semester credit hours. Students must complete a minimum of 18 hours in general science, 15 hours of secondary education core and 3 hours of either secondary education electives or educational foundation electives. A written comprehensive examination in general science and secondary education core and/or foundations is required.

Required General Science Specialization (18 Hours)

GCHM 5325 – Advanced Chemistry
Explores special topics selected from the areas of inorganic, analytical, physical, organic, biochemistry, or related fields. Required of students seeking Master's Degree in General Science Education. Prerequisite: Chem 3420 and Graduate Status in General Science Education .

GCHM 5331 – Higher Order Thinking in Science
Designed to introduce middle school or secondary science teachers to modern methods of science instruction. A series of laboratory exercises involving cooperative learning, discovery learning and integration scientific disciplines are introduced. Teachers may choose to adopt some of these exercises for use in their classrooms. Prerequisite: Graduate in-training or in-service science teacher status.

GBIO 5300 - Advanced Biology
Designed to identify and describe selected major biological challenges faced by both plants and animals, and to provide students with an understanding of the diverse ways these challenges are met. The evolutionary and ecological significance of the similarities and differences between plant and animal strategies will be emphasized.

GBIO 5330 – Advanced Cell Biology
Designed to give students an in-depth understanding of advances in cell biology with emphasis on biological membranes, cell-to-cell adhesion, cell signal transduction, receptors, cell cycle control and apoptosis.

GCHM 5355 – Advanced Physics
This course covers laws of planetary motion, kinetic theory of gases, special theory of relativity, electromagnetism, fiber optics, wave mechanics, quantum theory, atomic structure, nuclear structure, piratical physics, and solid state physics. Prerequisites: Physics 2420 and Graduate Status.

GCHM 5365 Advanced Environmental Science
In a semi-quantitative way, the course presents the earth's atmosphere, basic physical and chemical principles, evolution of the earth, local and regional pollution issues, earth's climate machine, greenhouse warming, ozone layer depletion, and global environmental engineering. Prerequisites: Physics 2420 and Graduate Status.

General Science Electives

GBIO 5320 - Laboratory Experiences/High School Teachers
This is a laboratory course designed to help the student master the biological concepts, equipment, materials, and techniques that he/she will encounter while teaching high school biology. The course emphasizes methods of presentation of curriculum materials, laboratory/classroom safety, use of the microcomputer, and designing, developing, and evaluating laboratory, field, and instructional activities. Students receive significant experiences with live specimen, inquiry and applications of biology.

GCHM 5111 - Advanced Laboratory
Offers experiences and advanced techniques in spectrophotometry, chromatrography, high temperature manipulations, non-aqueous solvent systems, electroanalytical methods, and inert atmosphere reactions. Prerequisite: Inorganic Chemistry 4310.

GCHM 5312 - Advanced Biochemistry
An overview of the basic concepts of biochemistry designed for high school biology or chemistry teachers. Proteins, carbohydrates, lipids, nucleic acids, enzymes, metabolism and molecular genetics are covered. Prerequisite: Organic Chemistry 3420 and Graduate Status.

GCHM 5330 - Methods in High School Chemistry Teaching
Covers content knowledge and pedagogy used in teaching high school chemistry courses. Team taught by faculty from the School of Education and the Department of Chemistry and Physics. Prerequisite: Chemistry 1440 and Graduate Status.

GCHM 5335 - Nuclear Chemistry
An overview of the broad field of nuclear and radiochemistry. Emphasis on application of the properties of radioactive nuclei to the solution of the chemical problems. Chemistry, physics, and biology majors may find this course applicable to their curriculum. Prerequisites: Calculus II 3320, University Physics II 3420, Quantitative Analysis 2430 and Physical Chemistry 4410.

GCHM 5340 - Advanced Organic Chemistry
Detailed study into the mechanisms of organic reactions and synthetic methods. Primarily for chemistry majors interested in attending post graduate school and/or pursuing additional careers in research. Prerequisites: 3410, 3420, and 4410.

GCHM 5350 - Chemical Separations
In depth coverage of chemical separations techniques. These separation (and identification) techniques have wide applicability for research and/or industrial chemists. This is an advanced course designed for chemistry majors interested in attending postgraduate schools. Prerequisites: 2430, and 4440.