Graduate School

of the

Institute for Creation Research

General Catalog

2008-2009

Notice of Non-Discriminatory Policy as to Students

The Institute for Creation Research Graduate School admits qualified students of any race, color, sex, national and ethnic origin or handicap to all the rights, privileges, programs and activities generally accorded or made available to students at the school. Pursuant to applicable law, it does not discriminate on the basis of race, color, sex, national, ethnic origin, or handicap in the administration of any of its policies or programs.

Terms of Website Use

The information in this catalog accurately represents the ICR Graduate School at the time of publication. However, the Graduate School reserves the right to make changes in policies, procedures, calendar, faculty, curriculum, and costs.

TABLE OF CONTENTS

INSTITUTE FOR CREATION RESEARCH

ICR Mission and Purpose

The mission of the Institute for Creation Research (ICR) is to study, teach, and communicate the works of God's creation.

ICR has been established for three main purposes:

> **Research**. As a research organization, ICR will engage in laboratory, field, theoretical, and library research on projects that seek to understand the science of origins and earth history.
>
> **Education**. As an educational institution, ICR will offer formal courses of instruction, conduct seminars and workshops, present radio and television lectures, or any other means of instruction.
>
> **Communication**. ICR will produce and/or publish books, films, periodicals, and other media for communicating the evidences and information related to its research and education to its own constituents and to the public in general.

Board of Trustees

The Institute for Creation Research (ICR) is administered by a Board of Trustees that consists of at least nine elected members plus the Chief Executive Officer and President, who serve Ex Officio. Members are elected by the members of the existing Board to serve for staggered three-year terms and are eligible for re-election to one additional term. At least three members are elected to serve on an Executive Committee that meets approximately bi-monthly. The entire Board meets at least twice annually. Current Board members are as follows:

Dr. David A. Wismer (Colorado Springs, Colorado), Chairman

Mr. Richard Bliss (Milwaukee, Wisconsin), Vice Chairman

Mr. Daniel Mitchell (White Oak, Texas)

Dr. Robert Armstrong (Belgrade, Montana)

Mr. Brian Bissell (Lakewood, Colorado)

Mr. Jack Brady (Dallas, Texas)

Dr. John Eckersley Jr. (Palm City, Florida)

Mr. Dan Manthei (Desert Hot Springs, California)

Dr. Henry Morris III (Irving, Texas)

Dr. John D. Morris (Santee, California)

Lt. Col. Charles C. Morse (Seoul, Korea)

The Board establishes general policies, approves budgets, and appoints the major administrative officers. ICR administration implements Board policies in day-to-day operations.

Technical Advisory Board

In addition to its regular professional staff, ICR has a Technical Advisory Board consisting of distinguished scientists and educators throughout the country who serve as consultants and advisors in various phases of ICR activities. These are as follows:

Edward F. Blick, Ph.D., Professor of Petroleum and Geological Engineering, Retired, University of Oklahoma

David R. Boylan, Ph.D., Professor of Chemical Engineering, Retired, Formerly Dean of Engineering, Iowa State University

Malcolm A. Cutchins, Ph.D., Professor Emeritus of Aerospace Engineering, Auburn University, Alabama

Raymond V. Damadian, M.D., Inventor and Professor, Woodbury, New York

Robert H. Eckel, M.D., Professor of Medicine, University of Colorado Health Sciences Center, Denver, Colorado

Carl B. Fliermans, Ph.D., Microbial Ecologist, Westinghouse, Savannah River Company, Aikon, South Carolina

Joseph L. Henson, Ph.D., Chairman Emeritus, Director of Natural Sciences, Bob Jones University, Greenville, South Carolina

Gailen D. Marshall, Jr., M.D., Ph.D., Associate Professor of Medicine and Pathology, Director, Division of Allergy & Clinical Immunology, University of Texas (Houston)

David Menton, Ph.D., Associate Professor Emeritus, Washington University School of Medicine, St. Louis, Missouri

John R. Meyer, Ph.D., Formerly Professor of Biology, Baptist Bible College, Clark's Summit, Pennsylvania; Currently Director, C.R.S. Research Center, Arizona

John W. Oller, Jr., Ph.D., Professor and Department Head of Communicative Disorders, University of Louisiana at Lafayette

Ker C. Thomson, D.Sc., Professor of Geophysics, Retired, Baylor University, Waco, Texas

John C. Whitcomb, Jr., Th.D., Formerly Director of Doctoral Studies, Grace Theological Seminary, Winona Lake, Indiana; Currently founder of Whitcomb Ministries, Inc.

ICR Administration

Chief Executive Officer	Henry M. Morris III
President	John D. Morris
Director of Research	Larry Vardiman
Dean of the Graduate School	Eddy Miller
Director of Communications	Lawrence Ford
Director of Administrative Services	Eileen Turner
Director of Donor Relations	Henry M. Morris, IV
Director of Internet Ministries	Richard Pferdner
Director of Information Technology	Daryl Robbins

A Word from the Chief Executive Officer

The Institute for Creation Research Graduate School (ICRGS) is the educational arm of ICR and an integral part of the Institute's broader mission. The ICRGS represents the finest educational effort of our research efforts, and has been granting Master of Science degrees since 1981.

Our faculty all have terminal degrees from prestigious universities around the United States, and are actively involved both in the design of the curricula and in cutting-edge technical and experimental research on the major issues of origins and earth history. ICRGS teaches experimental science as found in any standard university curricula, but maintains a different perspective when it comes to the historic or forensic science that interprets empirical data as it relates to those issues.

ICRGS students receive a rigorous and thorough education in the sciences, in which they are exposed to standard naturalistic and evolutionary theories found in secular universities, with the additional benefit that they are also challenged with evidences of the supernatural intervention of the Creator, thus ensuring a heightened ability and skill of critical thinking.

We are delighted that you are considering joining the ICRGS program. We stand ready to respond to your questions and trust that your decision—and your degree—will lead you to a fruitful and exciting life of service in the sciences.

Henry M. Morris III, D.Min.

A Word from the President

Thousands of scientists around the world contribute to an ever-deepening understanding of origins and earth history from a non-evolutionary perspective, and thousands of educators participate in efforts to disseminate that scientific knowledge. Polls of public opinion reveal that a majority of people question the veracity of the theory of evolution, which nonetheless holds a monopoly on discourse in the market place of ideas.

ICR Graduate School is known for its scientific research into and open advocacy of a creationist view of early earth history. The great world-altering events of Genesis inform our research, and is reflected in our teaching. Students have the rare opportunity to learn science from cutting-edge scientists, and education methodology from skilled educators. The online format facilitates the learning process, and the field and lab experiences increase practical knowledge.

All of us would encourage you to join us in the graduate school program, sharing with us as multitudes of trained colleagues join the ranks. May God lead you in the days ahead, and may He grant you multiplied fruit from your labors.

John D. Morris, Ph.D.

THE GRADUATE SCHOOL

Purpose and Goals

The Institute for Creation Research Graduate School (ICRGS) is the formal education arm of the Institute for Creation Research (ICR). The ICRGS program provides graduate-level training in science education through an online environment, with minors in the natural sciences that are particularly relevant to the study of origins.

The purpose of ICRGS is (1) to prepare science teachers and other individuals to understand the universe within the integrating framework of a biblical perspective using proven scientific data, and (2) to prepare students for leadership in science education. A clear distinction is drawn between scientific creationism and biblical creationism, but it is the position of the Institute that the two are compatible and that all genuine facts of science support the Bible.

The programs and curricula of the Graduate School, while similar in factual content to those of other graduate colleges, are distinctive in one major respect. ICR bases its educational philosophy on the foundational truth of a personal Creator-God and His authoritative and unique revelation of truth in the Bible.

Graduate School Administration

Dean of the Graduate School (Interim)	Eddy Miller, Ph. D.
Admissions Secretary	Mary Smith, B. S.
Registrar	Jack W. Kriege, Ph. D.

A Word from the Dean

Thank you for considering the Master of Science degree in Science Education at ICRGS. Our calling is to partner with students who are committed to a view of science and education that is not restricted to naturalistic processes and who have the zeal and self-discipline required to excel in an environment that is both rigorous and rewarding. If you join with us, you will have the opportunity to study with several of the foremost scholars in origins research and education, a priceless experience for school teachers like yourself who are committed to providing your own students with a thoroughly balanced science education.

Eddy Miller, Ph.D.

Our Philosophy of Science

ICR is committed to conducting science research in the same tradition as the great scientists of past generations—including Newton, Kepler, Faraday, Maxwell, Pasteur, Pascal, Kelvin, and Steno—whose efforts proved instrumental in the foundation of every major scientific discipline. These men held a sharp distinction between two fundamentally different endeavors that are both called science today.

Experimental science, which deals with the observable present, employs the concept of the laboratory. There the chemist, for example, designs his controlled experiments and is able to confirm his observations by repetition. He allows no tampering in his laboratory, for unless it is a closed system all results are invalidated.

Historical or *Origins* science (sometimes called *forensic* science), on the other hand, is not at liberty to project the assumption of a closed system into the indefinite past. For example, the archeologist who seeks to understand the origin of a circular pattern of stones in a field must entertain at least two possibilities in order for his investigation to have validity. Either the arrangement was random, or it was intentionally arranged by an external intelligence. His is an open system. The better the archeologist understands the laws of physics, probability, etc., that operate in the ordinary, everyday world as revealed to him by experimental science, the better equipped he will be to spot the extraordinary in his historical science.

The very thing excluded from one endeavor (outside intervention) is, in fact, the focus of investigation for the other. One feeds the other. The great scientists of the past could appreciate these distinctions and tended to see both the ordinary and the extraordinary as having come from the same source. Their belief in Providence in no way hindered their passion for science in the truest sense of that word; it was the very thing that ignited and sustained it.

We at ICR seek to follow no less an example.

Our Philosophy of Science Education

Teachers influence and shape the values of an individual and society through what and how they teach. They understand the learner, have a depth of content knowledge, and implement and assess learning science content through a variety of teaching practices that ensure learning. Science teaching is unique because "science" is all about asking questions through scientific inquiry, understanding the nature of science, seeking the answers by "doing" science utilizing the scientific method and reflecting through assessment successful learning. ICRGS prepares teachers to teach science by engaging students in meaningful learning based on a strong foundation of scientific content-knowledge and skills in utilizing scientific inquiry.

To teach science with confidence, the teacher must possess a depth of knowledge. Science teachers with adequate content knowledge teach with authority, answer students' questions, promote discussion, encourage inquiry and design appropriate instruction. During the acquisition process, graduate students must learn to distinguish between information that is derived from direct and formally structured observation and information that is inferred. There is a significant impact on the knowledge gained by students when the teacher skillfully interconnects understanding of the learner, content, curriculum, instruction and assessment. The faculty at ICRGS is committed to modeling these qualities.

The master teacher designs curriculum and instruction that is age-level appropriate to increase the scientific knowledge and to develop scientific reasoning and process skills. Appropriate instruction incorporates the following:

(a) minds-on: cognitive attention to the content;
(b) hands-on: utilizing physical senses to explore a concept; and
(c) hearts-on: enthusiasm for science and doing science

Engaging the students in doing science ensures all three. Students who are engaged in these aspects of learning science have a desire to learn science; furthermore, students are adequately prepared and aspire to continue their college education in science.

ICRGS faculty is committed to scientific inquiry and the scientific method. Doing science is an important aspect of learning science. Master science teachers utilize instructional tools and skills to help students design scientific experiments, analyze data, and draw conclusions from a variety of perspectives. These same skills help students solve problems and use higher level thinking skills throughout daily lives. Some of the skills of scientific inquiry include asking questions and proposing provable statements that help

create enthusiasm for the subject matter; allowing students to ask questions and search for the answers through observation and analysis of data result in more highly-developed scientific minds.

THE ACADEMIC PROGRAM

Scope and Sequence

The scope of the Master of Science degree in Science Education is five-fold:

1. Understanding the learner
2. Acquiring a knowledge base in science
3. Developing curricula, giving expression through instructional methodologies
4. Gaining knowledge in research processes, designing, successfully completing, and writing a research project for publication
5. Delivering instruction and assessing outcomes

Within this five-fold scope, courses are offered according to the following sequence template. If scheduling challenges occur, the Chair of the Science Education Department, in consultation with other appropriate Graduate School personnel, will resolve them in ways that are most consistent with the template.

1. Understanding the Learner:

SE 501 Advanced Educational Psychology

2. Acquiring a knowledge base in science:

Students who pursue the Astro-Geophysics minor, will complete the following courses:

AG 501 Planetary and Stellar Astronomy
AG 501L Planetary and Stellar Astronomy Laboratory
AG 502 Geochronology with Laboratory
AG 503 Paleoclimatology with Laboratory
AG 504 Cosmology

Or

Students who pursue the Biology minor, will select 28.5 quarter units from the following list of courses:

BI 501, 501L Biological Origins, and Laboratory
BI 502, 502L Comparative Vertebrate Anatomy, and Laboratory
BI 503, Principles and Patterns of Paleontology
BI 503L, Paleontology Field Investigations
BI 504 Advanced Ecology with Laboratory

BI 505 Advanced Cell and Molecular Biology

Or

Students who pursue the Geology minor, will select 25.5 quarter units from the following list of courses:

GE 501, Natural Disasters,
GE 501L Natural Disasters Field Experience
GE 502 Geochronology with Laboratory
GE 503, Principles and Patterns in Paleontology
GE 503L, Paleontology Field Investigations
GE 504 Interpreting Earth History

Or

Students who pursue the General Science minor will complete the following courses, plus select another science course that will fulfill the 24 quarter unit requirement for a General Science minor:

GE 501 Natural Disasters
GE 501L Natural Disasters Field Experience
BI 504 Advanced Ecology and Laboratory
AG 501, 501L Planetary and Stellar Astronomy, and Laboratory

3. Developing Curricula, giving expression through instructional methodologies:

SE 502 The Science Curriculum
SE 503 Planning Science Instruction: Methods

4. Designing, successfully completing, and writing for publication a research project:

SE 504 Research in Science Education
SC 580 Science Paper
SC 581 Comprehensive Examination

5. Delivering instruction and assessing outcomes:

SE 505 Implementing and Assessing Science Teaching

The Course Management System

The distance education web platform used by the Graduate School is Moodle, an internet-based curriculum development platform for online educational programs.

Students are responsible for their own hardware, software, and internet connection, but technical support is provided by the Graduate School to help students get connected. In addition, the Graduate School provides troubleshooting assistance if difficulties are encountered in establishing the connection.

Learning Resources

The learning resources that support faculty and students are designated as either primary or secondary, based on access.

Primary learning resources are electronic and consist of a carefully selected collection of web links and periodicals chosen by the faculty for their relevance to the curriculum. In order to connect students to the most recent research, web links are included in the online course materials. Each course includes these resources as a minimum, while some of the courses also include PDF files (used with permission).

Primary learning resource support is available by email and phone at designated hours from ICRGS support staff.

Secondary learning resources are in printed formats and are available through regional university libraries. The Registrar has contacted libraries that make their collections available to students who are enrolled elsewhere. Students who are interested in accessing these resources can contact the Registrar regarding the university library on the list that is most easily accessed, and receive the contact information and process to be followed in gaining access to the hard copy collection.

Students are also encouraged to do their own web and library searches to identify and access further information, and are required to cite the sources of such information in their writings. Learning resource support is available by email and phone at designated hours from ICRGS support staff.

THE ACADEMIC DEPARTMENTS

Department of Science Education
Patricia L. Nason, Ph.D. Chair

Introduction

The Master of Science degree in Science Education at ICRGS prepares science teachers to use effectively the skills of learning and teaching to promote higher level thinking, inquiry, depth in content knowledge and hands-on science among students so the learner can draw valid scientific conclusions relating to the natural sciences, with special attention to teaching empirical science research methodology and empirical science analysis, as well as origins science analysis.

This program enhances knowledge, skills, and abilities in science and pedagogy of science teachers. It is primarily intended for training teachers for middle and secondary schools, as well as educators who teach postsecondary freshmen and sophomores.

This program is also appropriate for some elementary teachers, science lecturers, administrators, and various types of science literature writers.

ICRGS is especially sensitive and responsive to the unique niche and needs in the science education market for quality-trained science educators who can teach in those private schools that select or invite a creation science perspective, such as church-affiliated Christian K-12 schools, Christian liberal arts colleges, and Bible colleges, as well as for various Christian parachurch organizations, including creation science literature publishers.

ICRGS's program is uniquely positioned and equipped to serve the educational needs of this specialized education market, as that market seeks science teachers who can teach from the creation science perspective, yet who are also well-informed on (and who can comparatively teach) the evolutionary model for interpreting origins and empirical scientific data.

Program Objectives

The ICRGS graduate will be able to integrate content knowledge in science from the evolutionary and creationist perspectives in their curriculum and instruction.

The ICRGS graduate will be able to utilize knowledge of student development and culture in his or her classroom to (a) plan learning goals and objectives,

and (b) to implement a variety of instructional methods that successfully convey scientific knowledge.

The ICRGS graduate will be able to apply skills in effective written, verbal, and non-verbal communication that exhibit the qualities of a communicator who stimulates the thinking of the listener/reader.

The ICRGS graduate will be able to (a) analyze research, (b) conduct his or her own research, and (c) develop curriculum and instructional materials that contribute to scientific knowledge in his or her science teaching field.

The ICRGS graduate will be able to implement assessment strategies for (a) self-evaluation, (b) student learning, (c) evaluation of curriculum and instruction, and (d) evaluation of scientific and educational research.

Prerequisites for Admission

The entrance requirements include a Bachelor's degree in a field of science and/or science education and/or science teaching experience, with adequate science or science education preparation as described in the minor. An overall 2.75 undergraduate GPA (3.0 in science and science-related courses) is required for admission into the graduate program. Students whose overall GPA falls between 2.5 and 3.0 may be admitted on probation, which means they will not be officially admitted into the program until they have completed 9-12 quarter hours with a GPA of 3.0 or higher. Students whose overall GPA is lower than 2.5 may be required to take the general GRE, which must be passed with a score of 1000 (adding the verbal and quantitative scores).

Requirements for Graduation

A total of 54 quarter hours (equal to 36 semester hours) of work beyond the bachelor’s degree are required for the Master’s degree. The requirements are composed of 22.5 quarter hours of core science education courses, 24 quarter hours from the department of the minor (Astro-Geophysics, Biology, Geology, General Science), 3 quarter hours of independent research, and 4.5 quarter hours of electives.

All Master’s degree students are required to complete a formal paper that is comparable to a refereed journal article. The paper will present a study in a field of science or science education. It will be journal submission "ready" before being accepted.

Courses

SE 501 Advanced Educational Psychology: Understanding the Learner
4.5 quarter hours

Survey of principles of developmentalism with an emphasis on skills that apply to successful science teaching. Topics include the importance of developmentalism; intellectual, social, moral, emotional, and spiritual development; ethnicity and cultures; individual uniqueness; cognitive psychology; constructing knowledge, thinking skills; behavioral approaches to learning; motivation; brain research and multiple intelligence. Note: There is an observation component to this course. (Prerequisite: admission to the Graduate School)

SE 502 The Science Curriculum
4.5 quarter hours

Study of curricular trends in science education in the United States, examination of philosophical implications of various approaches to curriculum design, and evaluation of current science curricula. Topics include: National Science Education Standards (NSES); progressivism, cognitive, traditional, behavioral, and structure of the disciplines curriculum approaches; process skills, behavioral objectives, inter- and intra-disciplinary, inquiry and assessment approaches, hands-on science, societal trends and issues. Includes individual/group scope and sequence project. (Prerequisites: SE 501; completion of courses in the minor or consent of instructor)

SE 503 Planning Science Instruction Methods
4.5 quarter hours

Planning and developing instruction that maximizes and supports learning through the use of the 5-E approach including active participation of students. Topics include: lab investigations (scientific method), discrepant events, brainstorming, cooperative learning, mind mapping, scientific inquiry, the use of technology, simulations, authentic assessment, interactive lectures, student projects. Variety of strategies required to be used in lesson plans. (Prerequisites: completion of science content courses and SE 502 or consent of instructor)

SE 504 Research in Science Education
4.5 quarter hours

Survey of the basic principles of science education research through analysis of research in science education. Topics include: interpreting science education research; qualitative and quantitative research designs; formulating a research

problem, collecting data, using research tools, communicating the results; historical research; evaluation research; case studies, action research, and statistical techniques. Students will conduct interviews, surveys, observations; collect and analyze data as class project. Students will submit a proposal for a research paper that is to be completed before graduation. (Prerequisites: SE 503)

SE 505 Implementing and Assessing Science Teaching
4.5 quarter hours

Application and evaluation of content knowledge, instructional and assessment skills in the learning environment. Assessment of effectiveness in the classroom setting. Self-critique of video-taped instruction implementing the 5-E learning cycle. Topics include: effective communication, formative and evaluative assessment strategies (applied), positive feedback, reflective evaluation, engaging students. *Note: this course has a practicum.* (Prerequisites: capstone course; all coursework must be completed except SE 507 Independent Study)

SE 510 Special Topics in Science Education
Variable quarter hours

Hands-on courses offered as the need arises for various topics in Science Education.

The Minor in General Science

Introduction

The minor in General Science is intended for individuals who do not teach science in a specific field (i.e., biology, geology, etc.). Such individuals usually do not have enough undergraduate science courses in a particular field of science but still meet the admission requirements with an adequate number of upper division science courses. Students who may fit this situation include elementary and/or general science teachers; speakers and/or writers who work for science research or education organizations, and others who are interested in the sciences.

Program Objectives

The ICRGS graduate who minors in General Science will be able to evaluate current scientific literature.

The ICRGS graduate who minors in General Science will utilize a variety of resources to continue building on his or her science and science teaching knowledge base.

The ICRGS graduate who minors in General Science will demonstrate a depth of scientific knowledge as it relates to perspectives on origins.

The ICRGS graduate who minors in General Science will be able to apply effective written and verbal communication skills that exhibit the qualities of a communicator who stimulates the thinking of the listener/reader.

Prerequisites for Admission

The entrance requirements include a Bachelor's degree in a field of science and/or science education and/or science teaching experience, with adequate science or science education preparation as described in the minor. An overall 2.75 undergraduate GPA (3.0 in science and science-related courses) is required for admission into the graduate program. Students whose overall GPA falls between 2.5 and 3.0 may be admitted on probation, which means they will not be officially admitted into the program until they have completed 9-12 quarter hours with a GPA of 3.0 or higher. Students whose overall GPA is lower than 2.5 may be required to take the general GRE, which must be passed with a score of 1000 (adding the verbal and quantitative scores).

Requirements for Graduation

Completion of the Science Education core, AG 501 (4.5 quarter hours) with AG 501L (3 quarter hours), BI 504 with laboratory (6 quarter hours), and GE 501 (4.5 quarter hours) with GE 505F (3 quarter hours) plus 7.5 quarter hours of electives. Electives can include the Supplemental Courses, and/or science courses for which candidates have met the prerequisites.

Courses

AG 501 Planetary and Stellar Astronomy
4.5 quarter hours

A survey of planetary and stellar astronomy, including aspects of the sky, time, coordinates, telescopes, and observational techniques. Topics include: early astronomy, light and telescopes, planet earth, motion and the moon, solar systems, planets, and star properties. (Prerequisites: SE 501 and/or permission of instructor)

AG 501L Planetary and Stellar Astronomy Laboratory
3 quarter hours

One week laboratory course offered on the campus of the University of South Carolina Lancaster (USCL) during the summer quarter, and includes access to the observatory of the Charlotte Amateur Astronomy Club which features a 24-inch Newtonian reflector, a 16-inch Cassegrain reflector, and a 6-inch Alvin Clark refractor. Topics include: lenses and telescopes, spectroscopy, earth's orbital velocity, sunspots, the Hertzsprung-Russell diagram, RR Lyrae stars, the Crab Nebula, Pulsars, structure of the Milky Way, the Hubble Relation, and quasars. (Prerequisites: SE 501, AG 501 or taken concurrently)

BI 504 Advanced Ecology with Laboratory
6 quarter hours

A model is presented for how the biosphere is designed, structured, and functions. Communities, ecosystems, and biomes are examined to see how they fit the model. Mankind's role in managing the earth is discussed and evaluated. Possible solutions to various environmental problems are evaluated. Field work is integrated with coursework. (Prerequisites: SE 501)

GE 501 Natural Disasters
4.5 quarter hours

Analysis of some of the most extraordinary geologic events that have affected the earth's surface, including displacement processes (earthquakes, landslides,

storm surges and tsunamis), nozzle and penetration events (caldera and summit eruptions, pluton intrusion, piping failure of natural dams, meteor impacts), and energetic granular flows (debris avalanches, debris flows, hyper-concentrated river floods, and pyroclastic flows). Focus is on eyewitness reports allowing geological classification and quantitative description. Mechanical analysis employs force vectors, energy balance, and work budgets with only occasional use of calculus. Probability analysis addresses potential threat to humans. This course is also appropriate for science educators needing broad experience with surface geologic processes. (Prerequisites: SE 501, and/or consent of instructor)

GE 505F Field Geology
3 quarter hours

Field explorations for science educators at selected geological locations in Southern California. Visits and instruction occur at shore-face strata sequence (Torrey Pines State Reserve), ancient delta of the Colorado River (Anza-Borrego Desert State Park), leading edge of the North American Plate boundary (San Andreas fault, Mojave Desert, and Owens Valley), craton-deposited marine flood strata (Sierra Nevada Mountains, Inyo Mountains and Mojave Desert), supervolcano structure and deposits (Owens Valley, Long Valley Caldera, Mammoth volcanic center, and Mono Craters), intrusive igneous structures (Peninsular Ranges Batholith, Sierra Nevada Batholith, and Independence dikes), and glacial landforms (Yosemite National Park). Maps, reports and rocks are supplied for the students prior to the field study. Students write a paper that stresses geologic skills of observing, classifying, measuring, interpreting and reporting. The nine-day field trip is offered in August. (Prerequisites: GE 501, GE 502)

Department of Astro-Geophysics
Larry Vardiman, Ph.D., Chair

Introduction

The Astro-Geophysics minor in science education trains teachers in a traditional physics core. The focus of the department's ongoing research programs is on the chronology and processes of stellar, planetary, and atmospheric systems. Students may apply the skills acquired in the physics core to critical questions arising from these research programs through specialized course work and a Science Paper. The Astro-Geophysics minor is designed to prepare teachers at college or secondary education levels**.** The ICRGS graduate who minors in Astro-Geophysics will demonstrate advanced levels of research process and content knowledge, plus presentation and communication skills, in those academic disciplines addressed by the curriculum.

Program objectives

The ICRGS graduate who minors in Astro-Geophysics will demonstrate an advanced level of knowledge acquired from both evolutionary and creationist sources and construct a personal perspective which allows the student to convey a model of earth history in accurate, technical terms.

The ICRGS graduate who minors in Astro-Geophysics will demonstrate proficiency in the use of nomenclature, data, procedures, and concepts of Astronomy, Cosmology, Paleoclimatology, and Geochronology.

The ICRGS graduate who minors in Astro-Geophysics will be able to analyze research data and findings, construct and interpret displays of original data, and utilize the data analysis skills obtained in the online setting.

The ICRGS graduate who minors in Astro-Geophysics will exhibit library research skills using current science journals to prepare a Science Paper, building on his or her knowledge base in Astro-Geophysics.

The ICRGS graduate who minors in Astro-Geophysics will be able to apply effective written and verbal communication skills that exhibit the qualities of a communicator who stimulates the thinking of the listener/reader.

Prerequisites for Admission

Students entering this course of study are expected to have completed during their undergraduate education the following course work: Mathematics – two semesters calculus; Physics – two semesters (8 semester hours), calculus-

based, including labs; Chemistry – two semesters (8 semester hours) including labs; Meteorology – one semester (3 semester hours); Astronomy – one semester (3 semester hours), Geology – one semester (3 semester hours).

Students with a minor emphasis in one of the other disciplines who desire to enroll in one of the Astro-Geophysics courses will be counseled as to their appropriate preparedness for success in the Astro-Geophysics course of their choice. A score above the 60th percentile on the Physics GRE subject test would merit enrollment in Astro-Geophysics courses.

Requirements for Graduation

Students choosing an emphasis in Astro-Geophysics must take 24 quarter hours from the Astro-Geophysics courses offered, including 4 hours of field or laboratory work. Planetary and Stellar Astronomy, AG 501, is required for all students desiring a Minor in General Science. Course work is best understood taken in the sequence designated by course numbering and the time of year the courses are offered beginning with the spring quarter.

Courses

AG 501 Planetary and Stellar Astronomy
4.5 quarter hours

A survey of planetary and stellar astronomy, including aspects of the sky, time, coordinates, telescopes, and observational techniques. Topics include: early astronomy, light and telescopes, planet earth, motion and the moon, solar systems, planets, and star properties. (Prerequisites: SE 501 and/or permission of instructor)

AG 501L Planetary and Stellar Astronomy Laboratory
3 quarter hours

One week laboratory course offered on the campus of the University of South Carolina Lancaster (USCL) during the summer quarter, and includes access to the observatory of the Charlotte Amateur Astronomy Club which features a 24-inch Newtonian reflector, a 16-inch Cassegrain reflector, and a 6-inch Alvin Clark refractor. Topics include lenses and telescopes, spectroscopy, earth's orbital velocity, sunspots, the Hertzsprung-Russell diagram, RR Lyrae stars, the Crab Nebula, Pulsars, structure of the Milky Way, the Hubble Relation, and quasars. (Prerequisites: SE 501, AG 501 or taken concurrently)

AG 502 Geochronology with Laboratory
6 quarter hours

A review, critique, and evaluation of methods and assumptions used to calculate the age of rocks and estimate the age of the earth, especially from radioisotope dating methods. Topics include: biblical chronology, scientific evidence for a young earth, the basics of radioactive decay and radioisotope dating, rubidium-strontium dating, potassium-argon dating, samarium-neodymium dating, uranium-thorium-lead dating, radiohalos and fission tracks, radiocarbon dating, and an accelerated decay model within a Biblical young-earth history. The laboratory requires original data on rubidium-strontium, potassium-argon, samarium-neodymium, uranium-lead, and carbon-14 to be downloaded, plotted, and interpreted using IsoPlot 3.0, which is an add-on to MS Excel. Cross referenced with GE 502. (Prerequisites: admission to the Astro/Geophysics minor, SE 501, AG 501, and/or consent of instructor).

NOTE: see "Using Online Data and Excel for Astro-Geophysics Laboratories" at the end of the Astro-Geophysics course listing below.

AG 503 Paleoclimatology with Laboratory
6 quarter hours

Descriptions and methods for evaluating current, past, and future climates: Paleoclimate reconstruction, climate and climatic variation, dating methods, ice cores, marine sediments and corals, non-marine geological evidence, pollen analysis, dendrochronology, documentary data, and paleoclimate models. The laboratory requires proxy variables from multiple sources to be downloaded, plotted and interpreted using MS Excel. (Prerequisites: admission to the Astro-Geophysics minor SE 501, AG 501)

NOTE: see "Using Online Data and Excel for Astro-Geophysics Laboratories" at the end of the Astro-Geophysics course listing below.

AG 504 Creation Cosmology and the Big Bang Theory
4.5 quarter hours

This course teaches the basics of cosmology, outlines the Big Bang theory, and contrasts it with several origins cosmologies. It touches on areas in science such as orbital mechanics, astronomy, relativity, and quantum mechanics, but not in great detail. It emphasizes concepts with a minimum of mathematics. Topics include: history of cosmology, stars and galaxies, a cosmic center, space and time, special relativity, curved space and general relativity, black and white holes, time dilation, Big Bang models, and creation models. (Prerequisites: admission to the Astro-Geophysics minor, SE 501, AG 501, AG 502, and AG 503 and/or consent of instructor)

AG 510 Special Topics in Astro-Geophysics
Variable hours

Hands-on courses offered as the need arises for various topics in Astro-Geophysics.

Using Online Data and Excel for Astro-Geophysics Laboratories

The laboratories for the Paleoclimatology and Geochronology courses require students to download, analyze, and interpret data provided online using a standard plotting routine called Excel. These data are not collected directly by the students in the field or in the laboratory, but are supplied either from sources online or by the professor from university, government, or commercial laboratories, as the direct collection of these data would be cost and time prohibitive for the students themselves.

For example, the collection of ice core data from Greenland and Antarctica require international teams and millions of dollars in equipment. The collection of almost all of the other data such as sea-floor sediment data, pollen data, satellite data, and global weather data are likewise prohibitive. Most researchers who report and analyze such data rely on specialists who collect and store their data on government and university websites. The U. S. government has established a policy that all data and model calculations done under government grants must be posted and available to whomever needs the data within a two-year period after they are collected. Students in Paleoclimatology will follow these standard practices of acquiring and analyzing such data.

Geochronology students are provided with data collected by ICRGS faculty and staff. Rocks are collected from Grand Canyon National Park, Yosemite National Park, Yellowstone National Park, Death Valley, Australia, Georgia, New Hampshire, etc. These rocks are then processed in the ICRGS laboratory and samples sent to commercial laboratories for component analyses. The results are then supplied to our students for plotting and interpretation. The cost and time constraints of such field and laboratory processing would not allow the majority of our students to be directly involved in the collection and processing.

Paleoclimatology students use MS Excel to plot and interpret the paleoclimatology data. Geochronology students use IsoPlot 3.0, an add-on to MS Excel developed at the Isotope Laboratory at the University of California at Berkeley, to plot and interpret the geochronology data. MS Excel contains a relatively easy-to-use plotting routine which has become a standard in the two fields, which allows for entering and displaying data on multiple types of plots and documenting the graphs in handy forms. A significant goal of the Astro-

Geophysics department is to make our students literate in plotting and displaying data in a clear, readable manner.

Department of Biology
Daniel C. Criswell, Ph.D., Chair

Introduction

The Master of Science degree in Science Education emphasis in Biology offers post-baccalaureate students the opportunity for adding depth and meaning to previous educational, vocational, or non-vocational experiences, from a unique perspective on bioscience. Through advanced course work and research activities, the program addresses the hierarchy of biological organization with an emphasis on origins, diversification, and integration of biological components and systems. The theoretical approach of studying living systems is conducive to scientifically productive inquiry, fostering a capacity for critical thinking and developing skills for the evaluation of evidence.

In the process of matriculation in the Master's degree with an emphasis in Biology at ICRGS, some students may identify special interests leading them to pursue a more advanced degree in bioscience. Otherwise, this Master's program has immediate application to such vocations as small college or secondary level teaching, science writing, and communication in a variety of non-vocational intellectual pursuits.

While the Biology curriculum is cohesive and structured for preparing the Master's degree candidate, the majority of individual course offerings are open to students majoring in other areas and to individuals whose immediate objective may not be a Biology emphasis in the Master's degree. The latter, including advanced undergraduates, are welcome in Biology courses of interest to them.

Program objectives

The ICRGS graduate who minors in Biology will be able to evaluate current biological literature and distinguish between biological origins perspectives.

The ICRGS graduate who minors in Biology will be able to utilize a variety of resources to continue building on his or her biology knowledge base.

The ICRGS graduate who minors in Biology will be able to demonstrate a depth of biological knowledge as it relates to the creationist perspective.

The ICRGS graduate who minors in Biology will be able to proficiently communicate in writing and verbally the significance of biological support from a young earth origins perspective.

Prerequisites for Admission

Students entering this course of study are expected to have completed during their undergraduate education the following course work: Biology – two semesters of general biology (or one semester each of zoology and botany), one semester in genetics, cell biology (or physiology), developmental biology, environmental biology (ecology), and anatomy and physiology; Chemistry – two semesters of general chemistry and two semesters of organic chemistry; Mathematics – one semester of introductory calculus and one semester of statistics; Physics – two semesters of general physics.

Students with a minor emphasis in one of the other disciplines for the Master of Science degree desiring to enroll in one of the Biology courses will be counseled as to their appropriate preparedness for success in the Biology course of their choice. A score above the 60th percentile on the Biology GRE subject test would merit enrolment in Biology courses.

Requirements for Graduation

Students choosing an emphasis in Biology must take 24 quarter hours from the biology courses offered, including three hours of field or laboratory work. Biological Origins (BI 501) is required for all students desiring a Minor in Biology. Course work is best understood taken in the sequence designated by course numbering and the time of year the courses are offered beginning with the fall quarter.

Courses

BI 501 Biological Origins
4.5 quarter hours

A survey focusing on the various theories of biological origin and diversification. Students will evaluate current theories of origins beginning with the origin of life and proceeding through the origin of cells, species, and man. All theories are reviewed in light of contemporary biological knowledge. Emphasis is placed on distinguishing between observation, hypothesis, evidence, and confirmation as applied to evaluating origins paradigms and their implications. (Prerequisites: SE 501 or consent of professor)

BI 501L Biological Origins Laboratory
1.5 quarter hours

An intensive one-week course designed to instruct Middle and High School teachers on how to integrate laboratory exercises into their curriculum. Instruction is based on teacher development in all phases of laboratory

protocols with an emphasis on new developments in biotechnology and bioinformatics useful in Middle School and High School classrooms. Students in the course participate in 10 laboratory modules designed to increase skills in teaching observation, hypothesis, evidence, and confirmation when applied to the evaluation of origins, ethics, and their implications. (Prerequisites: admission to biology minor, SE 501 and BI 501)

BI 502 Comparative Vertebrate Anatomy
4.5 quarter hours

In this class comparative vertebrate anatomy will be taught using texts and resources from a variety of origin philosophies. Scientific knowledge so gained will enable the student to evaluate the origin theories as presented. To be taken concurrently with BI 502L. (Prerequisites: admission to biology minor SE 501, BI 501, admission to biology minor and/or consent of professor)

BI 502L Comparative Vertebrate Anatomy Laboratory
1.5 quarter hours

This lab will concentrate on the structures of the various vertebrate classes. To enable practical application there will be weekly teaching adventures involving an evaluation of origin issues. We will concentrate on known facts and consider which paradigm of origins the facts fit best. To be taken concurrently with BI 502. (Prerequisites: admission to biology minor, SE 501, BI 501 or consent of professor)

BI 503 Principles and Patterns in Paleontology
4.5 quarter hours

Comparisons of criteria used to classify fossils and extant forms are analyzed in Systematic Paleontology for patterns used to propose and defend models for the origin and history of major taxonomic groups. (Cross-listed with GE 503) BI 503L to be taken concurrently. (Prerequisites: admission to biology minor, SE 501, BI 501, BI 502 with lab or consent of professor)

BI 503F Paleontology Field Investigations
1.5 quarter hours

Collect and identify fossils, especially from the Ice Age; participate in hands-on workshops; investigate fossil evidence relating to origins. Must be taken concurrently with BI 503 or after completion of BI 503. (Prerequisites: admission to biology minor, SE 501, BI 501, BI 502 with lab, or consent of professor)

BI 504 Advanced Ecology with Laboratory
6 quarter hours

A model is presented for how the biosphere is designed and structured and how it functions. Communities, ecosystems, and biomes are examined to see how they fit the model. Mankind's role in managing the earth is discussed and evaluated. Possible solutions to various environmental problems are evaluated. Field work is integrated with coursework. (Prerequisites: SE 501)

BI 505 Advanced Cell and Molecular Biology
4.5 quarter hours

A survey of the molecular processes governing inheritance and an investigation into the variation of these processes and their limits. Special consideration is given to current molecular topics related to the origin of biochemical pathways. (Prerequisites: SE 501, BI 501).

BI 510 Special Topics in Biology
Variable quarter hours

Hands-on courses offered as the need arises for various topics in Biology.

Department of Geology
Steve A. Austin, Ph.D., Chair

Introduction

The mission of the Geology Department is to teach and model by utilizing laboratory experiments and field observations how data on earth processes and structures are understood and evaluated within interpretive frameworks for earth history. The Master of Science degree in Science Education with an emphasis in Geology offers post-baccalaureate students the opportunity for adding depth and meaning to previous educational, vocational, and/or non-vocational experiences from a unique perspective on geological processes. The purpose is to prepare teachers with broad and specific experience in the geological sciences.

Program objectives

The ICRGS graduate who minors in Geology will be able to acquire knowledge in the geological sciences and construct a personal perspective of earth history using accurate, technical terms.

The ICRGS graduate who minors in Geology will be able to evaluate current geological literature and analyze results utilizing two interpretive frameworks in the field of Geology.

The ICRGS graduate who minors in Geology will be able to utilize a variety of resources to continue building on his or her geology knowledge base.

The ICRGS graduate who minors in Geology will be able to apply skills in effective written and verbal communication skills that exhibit the qualities of a communicator who stimulates the thinking of the listener/reader.

Prerequisites for Admission

Students entering this course of study are expected to have completed during their undergraduate education the following course work: Geology – one semester of physical or historical geology; Biology – one semester of zoology or botany; Chemistry – two semesters of general chemistry; Physics – two semesters of general physics; Mathematics – one semester of introductory calculus and one semester of statistics.

Students with a minor emphasis in one of the other disciplines for the Master's degree desiring to enroll in one of the Geology courses will be counseled as to their appropriate preparedness for success in the Geology course of their choice.

Requirements for Graduation

Students choosing an emphasis in Geology must take 24 quarter hours from the geology courses offered, including three hours of field or laboratory work. Course work is best understood taken in the sequence designated by course numbering and the time of year the courses are offered beginning with the fall quarter.

Courses

GE 501: Natural Disasters
4.5 quarter hours

Analysis of some of the most extraordinary geologic events that have affected the earth's surface including displacement processes (earthquakes, landslides, storm surges and tsunamis), nozzle and penetration events (caldera and summit eruptions, pluton intrusion, piping failure of natural dams, meteor impacts), and energetic granular flows (debris avalanches, debris flows, hyper-concentrated river floods, and pyroclastic flows). Focus is on eyewitness reports allowing geological classification and quantitative description. Mechanical analysis employs force vectors, energy balance, and work budgets with only occasional use of calculus. Probability analysis addresses potential threat to humans. This course is also appropriate for science educators needing broad experience with surface geologic processes. (Prerequisites: SE 501, and/or consent of instructor)

GE 502 Geochronology with Laboratory
6 quarter hours

A review, critique, and evaluation of methods and assumptions used to calculate the age of rocks and estimate the age of the earth, especially from radioisotope dating methods. Topics covered are: biblical chronology, scientific evidence for a young earth, the basics of radioactive decay and radioisotope dating, rubidium-strontium dating, potassium-argon dating, samarium-neodymium dating, uranium-thorium-lead dating, radiohalos and fission tracks, radiocarbon dating, and an accelerated decay model within a Biblical young-earth history. The laboratory requires original data on rubidium-strontium, potassium-argon, samarium-neodymium, uranium-lead, and carbon-14 to be downloaded, plotted, and interpreted using IsoPlot 3.0 which is an add-on to MS Excel. (Prerequisites: admission to geology minor, SE 501, GE 501, and/or consent of instructor)

NOTE: see "Using Online Data and Excel for Astro-Geophysics Laboratories" at the end of the Astro-Geophysics course listing below.

GE 503 Principles and Patterns in Paleontology
4.5 quarter hours

Comparisons of criteria used to classify fossils and extant forms are analyzed in Systematic Paleontology for patterns used to propose and defend models for the origin and history of major taxonomic groups. (Cross-listed with BI 503) GE 503L to be taken concurrently. (Prerequisites: admission to geology minor, SE 501, GE 501, GE 502, and/or consent of professor)

GE 503F Paleontology Field Investigations
1.5 quarter hours

Collect and identify fossils, especially from the Ice Age; participate in hands-on workshops; investigate fossil evidence relating to origins. (Cross-listed with BI 503L)Must be taken concurrently with GE 503 or after completion of GE 503. (Prerequisites: admission to geology minor, SE 501, GE 501, GE 502 with lab or consent of professor)

GE 504 Interpreting Earth History
4.5 quarter hours

Survey of the human quest to understand the earth's past. Overview of terminology and methodology for describing and interpreting earth history from geological and geophysically-inferred structures and processes. Analysis of uniformitarian and catastrophist approaches to interpreting earth history. Application of computational techniques to simulate geological and geophysical processes. Exploration of the limitations of both uniformitarian and catastrophist paradigms. (Prerequisites: admission to geology minor, SE 501, GE 501, GE 502,and GE 503 with lab and/or consent of instructor)

GE 505F Field Geology
3 quarter hours

Field explorations for science educators at selected geological locations in Southern California. Visits and instruction occur at shore-face strata sequence (Torrey Pines State Reserve), ancient delta of the Colorado River (Anza-Borrego Desert State Park), leading edge of the North American Plate boundary (San Andreas fault, Mojave Desert, and Owens Valley), craton-deposited marine flood strata (Sierra Nevada Mountains, Inyo Mountains and Mojave Desert), supervolcano structure and deposits (Owens Valley, Long Valley Caldera, Mammoth volcanic center, and Mono Craters), intrusive igneous structures (Peninsular Ranges Batholith, Sierra Nevada Batholith, and Independence dikes), and glacial landforms (Yosemite National Park). (Prerequisites: GE 501, GE 502)

GE 510 Special Topics in Geology
Variable quarter hours

Hands-on courses offered as the need arises for various topics in Geology.

Supplementary Courses

SC 501 The History and Nature of Science
4.5 quarter hours

Study of historical science and survey of literature of major philosophers of science reveals clashes in perception throughout history. Individuals will discover how interpretation of the meaning of the nature of science has affected science. Topics include: philosophy of science, STS (science-technology-society), inquiry, the nature of science, history of science. (Prerequisites: SE 501, science content classes and consent of instructor)

SC 580 Science Paper
3 quarter hours

After identifying a topic and developing a proposal in SE 504, students will complete a formal paper that is comparable to a refereed journal article, and must be in journal-submission form before it can be accepted. The paper must present a study in the field of Science Education or the scientific discipline in which students are pursuing their minors.

Contents of the latest edition of *The Publication Manual of the American Psychological Association* and the *ICR Instructions for Preparation and Submission of the Science Education Paper* will govern format (including quotations, footnotes, endnotes, bibliographical references, tables and illustrations, etc.).

SC 581 Comprehensive Examination
No quarter hours

A final oral examination will be administered through a conference call after students have completed the program of study and all other requirements for graduation. Members of the examining committee will include representatives from the Department of Science Education and from the Department in which students pursued minors. Students will be given a general study guide prior to the oral examination. Its contents will include questions pertaining to the courses taken the Science Paper. Students must pass the comprehensive examination in order to graduate.

THE FACULTY

Steven A. Austin, Professor of Geology and Chair of the Department of Geology

B. S., University of Washington, Seattle, Washington, 1970
M. S., San Jose State University, San Jose, California 1971
Ph. D., Pennsylvania State University, College Park, Pennsylvania, 1979

John R. Baumgardner, Associate Professor of Geophysics

B. S., Texas Tech University, Lubbock, Texas, 1968
M. S., Princeton University, Princeton, New Jersey, 1970
M. S., University of California, Los Angeles, California, 1981
Ph. D., University of California, Los Angeles, California, 1983

Sharon E. Cargo, (adjunct) Assistant Professor of Biology

B. S., Ohio State University, Columbus, Ohio, 1972
D.V.M., Ohio State University, Columbus, Ohio, 1977
M. S., Institute for Creation Research Graduate School, Santee, California, 2002

Daniel C. Criswell, Assistant Professor of Biology and Chair of the Department of Biology

B. S., Weber State University, Ogden, Utah, 1982
M. S., Institute for Creation Research Graduate School, Santee, California 1994
Ph. D., University of Montana, Missoula, Montana, 2004

Stephen W. Deckard, (adjunct) Professor of Education

B. A., McKendree College, Lebanon, Illinois, 1975
M. S., University of Illinois, Champaign, Illinois 1979
Ed. D., Agrosy University, Sarasota, Florida, 1993

David A. DeWitt, (adjunct) Associate Professor of Biology

B. S., Michigan State University, East Lansing, Michigan, 1991
Ph. D., Case Western Reserve University, Cleveland, Ohio, 1996

Danny R. Falkner, (adjunct) Associate Professor of Astronomy

B. S., Bob Jones University, Greenville, South Carolina 1976
M. S., Clemson University, Clemson, South Carolina 1979
M. A., Indiana University, Bloomington, Indiana 1983
Ph. D., Indiana University, Bloomington, Indiana 1989

Russell D. Humphreys, Associate Professor of Physics

B. S., Duke University, Durham, North Carolina, 1963
Ph. D., Louisiana State University, Baton Rouge, Louisiana, 1972

Eddy Miller, Dean of the Graduate School

B. A., Northwestern State University, Natchitoches, Louisiana, 1963
M. S. in Ed., Southern Illinois University, Carbondale, Illinois, 1965
Ph. D., U. S. International University, San Diego California, 1969

Patricia L. Nason, Associate Professor of Science Education and Chair of the Department of Science Education

B. A., Sam Houston State University, Huntsville, Texas, 1984
M. Ed., Texas A&M University, College Station, Texas, 1991
Ph. D., Texas A&M University, College Station, Texas, 1994

Chris Osborne, (adjunct) Professor of Biology

B. A., California State University, Fullerton, California, 1975
M. S., Institute for Creation Research Graduate School, Santee, California, 1985
Ph. D., Loma Linda University, Loma Linda, California, 1989

Gary Parker, Professor of Biology

B.A., Wabash College, Crawfordville, IN, 1962
M.S., Ball State University, Muncie, IN, 1965
Ed.D., Ball State University, Muncie, IN, 1973

Larry Vardiman, Professor of Atmospheric Science and Chair of the Department of Astro-geophysics

B. S. University of Missouri, Rolla, Missouri, 1965
M. S., St. Louis University, St. Louis, Missouri, 1967
M. S., Colorado State University, Fort Collins, Colorado, 1972
Ph. D., Colorado State University, Fort Collins, Colorado, 1974

ADMISSIONS

Introduction

The Graduate School seeks to partner with prospective students who have a strong science background and who desire to increase both their knowledge of the scientific evidences pertaining to origins and their skills and abilities in teaching such evidences.

Most current students in the Graduate School are already engaged in teaching and have either obtained certification to teach in their respective states or have determined that such certification is not required.

Prospective students who are seeking state certification as teachers should examine closely the policies and procedures required for certification in their respective states, and should not anticipate that a degree from the Graduate School will achieve this outcome.

The Graduate School has designed all its learning activities to help students become better teachers and uses as evidence for achieving this outcome graduates' scores on the National Teachers Exam (PRAXIS).

Prerequisites

Applicants who are admitted to degree seeking status will possess a variety of academic qualifications, which include the following:

> An undergraduate degree from a regionally accredited college or university (or in the case of international applicants, an institution of equivalent standing)
>
> A cumulative grade-point average for the undergraduate degree of 2.75 or higher (4.0 = A)
>
> Undergraduate courses in the sciences and supporting academic disciplines, as specified in the section of this catalog that presents the Academic Departments and their requirements for a minor (see "Prerequisites for Admission"), with a grade-point average of 3.0 or higher (4.0 = A)

Applicants who do not meet these prerequisite standards may be asked to demonstrate their potential for academic success by fulfilling additional requirements.

Admissions Procedures

When to Apply

In order to be considered for matriculation in any given quarter, applications for admission, along with all other supporting materials, must be in the hands of the Admissions secretary no later than 30 days prior to the beginning of the quarter in which matriculation is sought.

How to Apply

The ICRGS Master of Science degree is provided primarily through an online program. Your ability to successfully use the ICRGS website to apply for the program is one immediate indicator of your ability to undertake an online candidate program.

Application materials can be obtained *via* the ICRGS website at www.icr.edu.

Admissions office:

Telephone:	214.615.8300
Fax:	214.615.8299
E-Mail:	apply@icr.edu
Postal mail:	Ms. Mary Smith Admissions Secretary ICR Graduate School 1806 Royal Lane Dallas, Texas 75229

Once you download the application materials from www.icr.edu:

1. Complete the Application and send it via postal mail to the Admissions office at the address above;
2. Request official transcripts (copies are not acceptable) to be sent via postal mail to the Admissions office at the address above;
3. Request two character references by following the directions on the Character Reference Forms;
4. Email the essay portion of the application to apply@icr.edu.

Note: The Family Education Rights and Privacy Act of 1974 allows college students access to their files; however, letters of recommendation have traditionally not been shown to students. Because of the importance of

preserving the confidentiality of letters of recommendation, educational institutions are permitted to suggest that applicants may waive their rights of access to letters of recommendation. It is, therefore, suggested to applicants that they consider waiving their rights to see these recommendations. Signing such a waiver statement is not required as a condition of admission. Signing the waiver statement on the reference form is all that is necessary to implement this waiver.

Transfer Applicants

All of the information included above applies to first-time graduate applicants and those who have already taken coursework at the graduate level.

FINANCIAL INFORMATION

Introduction

The Graduate School seeks to provide a program of high quality for all its students at the most reasonable cost possible. As a private, not-for-profit institution, the Graduate School receives no support from taxes or other public funds, thus the tuition and fees charged must be supplemented by significant outside gifts from concerned individuals in order to keep costs at levels that are feasible for students. The expenses of students at the Graduate School are shown below. The Graduate School must reserve the right to change all student charges, modify its services, or change its programs of study should economic conditions, curriculum revisions, or national emergency make it necessary to do so.

Tuition

Per quarter hour	$150.00	
Total cost for 54 quarter hours		$8,100.00

Special Fees (Non-Refundable)

Textbooks and supplies (about $150/course)		$1,800.00
Application Fee: Must be submitted before application can be processed		$ 30.00
Supplemental Laboratory or Field Trip costs (may vary depending on course)		$3,500.00
Processing Fee for Graduation		$ 20.00
Transcript Fee (first transcript is free)	$2.00	

Estimated Cost for the Program **$13,450.00**

ACADEMIC PROGRESS

Academic Advising

Upon acceptance into the program, the student is assigned an Academic Advisor by the Dean. The advisors assume immediate responsibility for the programs and counseling of graduate students in their respective minors. The program course sequence is available to students and faculty on the distance education website.

Academic counseling is available via telephone calls, email, or virtual office from the student's Academic Advisor, Department Chairs, or other faculty members. By the time 12 quarter hours have been completed, the student will declare a minor and then a degree plan will be completed by the Academic Advisor. The degree plan will be kept on file in the graduate office and made available to the student upon request.

The faculty at large will also provide career counseling upon request.

Transfer Credit

A maximum of nine quarter hours (six semester units) of graduate coursework may be transferred from other approved graduate institutions. A catalog description of the course(s) to be transferred should be included. The course(s) must have been completed within the most recent five year time period. The Admissions Review Committee will evaluate the course(s) to be transferred and make a recommendation.

Registration

Official registration for courses is required at the beginning of each quarter. Students will not be admitted to classes until they have completed the formal registration process described below.

Registration is a two-part process.

1. The first part involves academic advisement, new student orientation, and registration. Once students are admitted to degree seeking status, their names are put into the distance education website. By contacting their Advisor, students will receive assistance in choosing the most appropriate course for which to register and will be given the information needed to access this website. Once the students gain access, they can

complete the online orientation, and then register for the appropriate classes.

2. The second part involves payment of tuition and fees. Complete and print the enrollment form, following the instructions provided. Early enrollment is advised to ensure a place in the class. Enrollments are processed in the order received and must be accompanied by the full fee, or by VISA or MasterCard charge. Cost per quarter unit is $150 per quarter hour or a total of $675 per 4.5 quarter hour course.

Students must register by the day the class begins, and enrollment is not official until the fee is processed. Access to the online courses will be available once the enrollment is complete.

Dropping and Adding Courses

Students may add courses at any time prior to the beginning of the third week of the quarter by contacting the Registrar, enrolling in the class, and paying the assessed tuition and fees as directed by the Registrar.

Students may drop a course at any time before the beginning of the fourth week of the quarter by completing a withdrawal form, which can be obtained by contacting the Registrar. A grade of "WP" or "WF" will be awarded, based on performance in the course up to the point of withdrawal. If withdrawal is made without proper notice, a grade of "WF" will be recorded.

Refunds

A student may be entitled to a partial refund of tuition, providing proper withdrawal procedures are completed in the Registrar's Office. Failure to participate in the online courses will not entitle a student to a refund unless the proper withdrawal procedures are followed, including payment of all outstanding financial obligations to the Institute. A student who has not made total payment for a class and drops without filing an official withdrawal will be responsible for the remaining balance. In the event a student is dismissed, no refund is warranted; however, the Dean and/or CEO of the Institute may consider authorizing a partial refund if mitigating circumstances appear to justify it.

Students who voluntarily withdraw, following proper procedures, may request the following partial tuition refunds (no refunds can be given for any of the Special Fees):

Withdrawal	Amount Refunded
Prior to or during first class meeting	100%
Prior to the completion of one-third of the class	67%
After this time	0%

Grading Scale

Grade	Grade point
A	4.00
A-	3.67
B+	3.33
B	3.00
B-	2.67
C+	2.33
C	2.00
C-	1.67
D+	1.33
D	1.00
D-	0.67
F	00

Courses with a D or F are not accepted and need to be retaken – your new grade will replace the old grade.

Declaration of a Minor

When seeking a minor in Biology, Astro-Geophysics, Geology, or General Science, the potential student must have adequate subject preparation for the proposed graduate minor. If a student does not have a 2.5 GPA and/or he or she does not have adequate coursework in the minor the student wishes to pursue, then the student must take both the specialty GRE exams and receive a score above the 50th percentile.

Students inadequately prepared for their desired minor may be admitted to the program on a conditional basis. The Department Chairman and committee

members will identify deficiencies and require completion of them prior to beginning the courses in the minor. Course deficiencies can be completed at accredited colleges and universities approved in advance by the Department Chair. Details of conditional admission will be stated in the student's letter of admission. Courses identified as deficiencies are in addition to the 54 quarter hours required for graduation.

Leave of Absence

Students who are not able to maintain normal progress in pursuing their degrees may request a leave of absence by contacting the Dean of the Graduate School. A leave of Absence is normally granted for up to one year, but may be extended, at the discretion of the Dean.

Withdrawal

Students who do not intend to complete their degree program are requested to complete a formal petition for withdrawal. Students who are contemplating withdrawal should contact the Dean.

Readmission

Students who have withdrawn from the Graduate School and desire to return must submit a new application along with new references and transcripts from all postsecondary institutions attended since leaving the Graduate School. Applications for readmission will be reviewed by the Admission Committee, and applicants will be notified by the Dean.

GRADUATION REQUIREMENTS

Introduction

Students are expected to complete all requirements for graduation that are in place at the time of matriculation. Students who choose to change minors after matriculating will need to meet the graduation requirements associated with the new minor. Such a decision may extend the time needed to complete degree requirements.

Normal Progress and Time Limit

Students who complete three courses per year are considered to be making normal progress. Students who fail to take at least one course in two consecutive quarters may need to re-apply for admission and be subject to the degree requirements in place at the time of this subsequent matriculation.

Regardless of students' registration frequency, the maximum length of time allowed for completion of all degree requirements is six years.

Graduation Policies

Complete at least 54 quarter hours (equals 36 semester units) of graduate coursework that are distributed in the following ways:

27 quarter hours (18 semester units) in Science Education;
24 quarter hours (16 semester units) in a science minor;
3 quarter hours (2 semester units) in completing the science paper.

Maintain a cumulative grade point average of at least 3.0;

Present a Science Paper of publishable quality;

Pass a comprehensive examination over the curricular content.

DISTANCE EDUCATION FAQ

Q. Which degrees are offered through ICRGS Online Distance Education?
A. Master of Science in Science Education.

Q. What are the goals of the ICRGS Online Distance Education program?
A. The overall goals of our distance learning community are to:

- create a network of science teachers who desire to teach scientific truths about biblical creation;
- learn the most effective ways to teach scientific truths about biblical creation;
- unite teachers and learners in a meaningful learning endeavor to grow spiritually as well as intellectually;
- carry course content through the use of electronic educational media;
- establish two-way communication between instructors and students, or student and students, although they are separated in space and time;
- explore together the scientific truths of biblical creation and biblical concepts of teaching those truths, while allowing students to pursue their own interests in these areas; and
- establish an active learning environment through logging on and contributing to conversations that show evidence of discernment and critical thinking when confronted with various philosophies of science and science education.

Q. Why should I get my degree through distance education?
A. There are several advantages to participating in an online degree program. Advantages include that the learner:

- does not have to give up his or her family responsibilities to get a degree;
- can maintain his or her professional responsibilities providing financially for himself or herself;
- can go to class and study within his or her own weekly time frame rather than having to set aside particular hours every week (flexibility);
- does not waste time driving to and from the location of classes;
- encumbers no expenses (such as a place to live, gas for a car, etc.) outside of the cost of tuition and books;
- does not have to take time out of his or her summer to go to a college or university to take courses; and
- develops synergy working with other like-minded individuals throughout the country and the world.

Q. How is ICRGS's Masters in Science Education Online program unique?
A. The Institute for Creation Research Graduate School's program in Science Education:

- teaches science from a creationist perspective;
- grounds the learner in a biblically-based program in the sciences with science and teaching science as the focus;
- educates the learner to discern the biblical perspective in science and science teaching;
- provides the learners (science teachers) a chance to network with other science teachers so they can develop a network of Christian educators who support creation science (research shows that students in interactive online programs know each other better than those in face-to-face classes);
- assists the learner in developing creation apologetics in his or her science classroom;
- teaches the learner how to develop curriculum, instructional strategies, and classroom activities related to creation science;
- uses a quarter system with all the students in the course learning the same material at the same time; and
- implements due dates for learner accountability and to help manage and organize the courses.

Q. Is distance education right for me?
A. The distance education learner is active and creative in the learning process. He or she is a successful learner in a computer-mediated environment. To help facilitate active and creative learning, asynchronous (posting comments to a discussion area) and synchronous (logging on to a discussion at the same time) discussions may be used, and collaborative projects are encouraged.

The individual learner who participates in a distance learning community:
- is self-motivated
- has higher expectations of themselves
- is more self-disciplined
- takes education seriously
- takes responsibility in helping create a learning community (unity of believers). This is done by displaying the following characteristics:
    - upholds honesty when working with others and in what is produced
    - expresses responsiveness to others' needs
    - demonstrates respect to others – whether teacher or student
    - exhibits a work ethic

Q. What is the role of the Instructor in a distance education learning community?
A. The instructor in the ICRGS Online Distance Education program functions in a variety of roles in order to help create a learning community and to model

the qualities that the learners should exhibit in their own classrooms. These roles include:

- **Instructor/Teacher:** determines the content in science and science education (and how it is delivered) that the learner must know and apply in order to be a master teacher of creation science.
- **Mentor:** shares knowledge and experiences that are in the learner's best interests; is a role model; and provides feedback to individuals and small groups, frequently defining, explaining, or modeling the standard for good work.
- **Facilitator:** makes things easier for the learner by answering his or her questions, organizing the content and time frame of its delivery so the learner's knowledge and understanding build.
- **Encourager:** promotes trust within the learning community; emphasizes the essential habits of mind (critical thinking, doing one's best, respect for each other).
- **Guide/Manager:** leads or directs the learner to his or her destination.
- **Assessor/Evaluator:** provides feedback to individuals and small groups, frequently defining, explaining, or modeling the standard for good work; uses a variety of tools to measure and evaluate learner progress.

Q. How do I start the admission process?

A. Visit the icr.edu website and click on the Contact icon.

FOUNDATIONAL PRINCIPLES

The Institute for Creation Research Graduate School has a unique statement of faith for its faculty and students, incorporating most of the basic Christian doctrines in a creationist framework, organized in terms of two parallel sets of tenets, related to God's created world and God's inspired Word, respectively. Reproduced below are the ICR Tenets of Scientific Creationism and Biblical Creationism.

Principles of Scientific Creationism

- The physical universe of space, time, matter, and energy has not always existed, but was supernaturally created by a transcendent personal Creator who alone has existed from eternity.
- The phenomenon of biological life did not develop by natural processes from inanimate systems but was specially and supernaturally created by the Creator.
- Each of the major kinds of plants and animals was created functionally complete from the beginning and did not evolve from some other kind of organism. Changes in basic kinds since their first creation are limited to "horizontal" changes (variations) within the kinds, or “downward” changes (*e.g.*, harmful mutations, extinctions).
- The first human beings did not evolve from an animal ancestry, but were specially created in fully human form from the start. Furthermore, the "spiritual" nature of man (self-image, moral consciousness, abstract reasoning, language, will, religious nature, etc.) is itself a supernaturally created entity distinct from mere biological life.
- The record of earth history, as preserved in the earth's crust, especially in the rocks and fossil deposits, is primarily a record of catastrophic intensities of natural processes, operating largely within uniform natural laws, rather than one of gradualism and relatively uniform process rates. There are many scientific evidences for a relatively recent creation of the earth and the universe, in addition to strong scientific evidence that most of the earth's fossiliferous sedimentary rocks were formed in an even more recent global hydraulic cataclysm.
- Processes today operate primarily within fixed natural laws and relatively uniform process rates, but since these were themselves originally created and are daily maintained by their Creator, there is always the possibility of miraculous intervention in these laws or processes by their Creator. Evidences for such intervention should be scrutinized critically, however, because there must be clear and adequate reason for any such action on the part of the Creator.

- The universe and life have somehow been impaired since the completion of creation, so that imperfections in structure, disease, aging, extinctions, and other such phenomena are the result of "negative" changes in properties and processes occurring in an originally-perfect created order.
- Since the universe and its primary components were created perfect for their purposes in the beginning by a competent and volitional Creator, and since the Creator does remain active in this now-decaying creation, there do exist ultimate purposes and meanings in the universe. Teleological considerations, therefore, are appropriate in scientific studies whenever they are consistent with the actual data of observation. Furthermore, it is reasonable to assume that the creation presently awaits the consummation of the Creator's purpose.
- Although people are finite and scientific data concerning origins are always circumstantial and incomplete, the human mind (if open to possibility of creation) is able to explore the manifestations of that Creator rationally, scientifically, and teleologically.

Principles of Biblical Creationism

- The Creator of the universe is a triune God: Father, Son, and Holy Spirit.[1] There is only one eternal and transcendent God, the source of all being and meaning, and He exists in three Persons, each of whom participated in the work of creation.
- The Bible, consisting of the thirty-nine canonical books of the Old Testament and the twenty-seven canonical books of the New Testament, is the divinely-inspired revelation of the Creator to man. Its unique, plenary, verbal inspiration guarantees that these writings, as originally and miraculously given, are infallible and completely authoritative on all matters with which they deal, free from error of any sort, scientific and historical as well as moral and theological.
- All things in the universe were created and made by God in the six literal days of the Creation Week described in Genesis 1:1-2:3, and confirmed in Exodus 20:8-11. The creation record is factual, historical, and perspicuous; thus all theories of origins or development that involve evolution in any form are false. All things that now exist are sustained and ordered by God's providential care. However, a part of the spiritual creation, Satan and his angels, rebelled against God after the creation and are attempting to thwart His divine purposes in creation.

[1] The Holy Spirit is one of the three divine Persons of the Holy Trinity, one God in three persons. His ministry is to convict, regenerate, indwell, instruct, and guide all believers in Christ.

- The first human beings, Adam and Eve, were specially created by God, and all other men and women are their descendants. In Adam, mankind was instructed to exercise "dominion" over all other created organisms, and over the earth itself (an implicit commission for true science, technology, commerce, fine art, and education), but the temptation by Satan and the entrance of sin brought God's curse on that dominion and on mankind, culminating in death and separation from God as the natural and proper consequence.
- The biblical record of primeval earth history in Genesis 1-11 is fully historical and perspicuous, including the creation and Fall of man, the Curse on the Creation and its subjection to the bondage of decay, the promised Redeemer, the worldwide cataclysmic deluge in the days of Noah, the post-diluvian renewal of man's commission to subdue the earth (now augmented by the institution of human government), and the origin of nations and languages at the tower of Babel.
- The alienation of man from his Creator because of sin can only be remedied by the Creator Himself, who became man in the person of the Lord Jesus Christ, through miraculous conception and virgin birth. In Christ we are indissolubly united perfect sinless humanity and full deity, so that His substitutionary death is the only necessary and sufficient price of man's redemption. That the redemption was completely efficacious is assured by His bodily resurrection from the dead and ascension into heaven; the resurrection of Christ is thus the focal point of history, assuring the consummation of God's purposes in creation.
- The final restoration of creation's perfection is yet future, but individuals can immediately be restored to fellowship with their Creator on the basis of His redemptive work on their behalf, receiving forgiveness and eternal life solely through personal trust in the Lord Jesus Christ, accepting Him not only as estranged Creator, but also as reconciling Redeemer and coming King. Those who reject Him, however, or who neglect to believe on Him, thereby continue in their state of rebellion and must ultimately be consigned to the everlasting fire prepared for the devil and his angels.
- The eventual accomplishment of God's eternal purposes in creation, with the removal of His curse and the restoration of all things to divine perfection, will take place at the personal bodily return to earth of Jesus Christ to judge and purge sin and to establish His eternal kingdom.
- Each believer should participate in the "ministry of reconciliation" by seeking both to bring individuals back to God in Christ (the "Great Commission") and to "subdue the earth" for God's glory (the Edenic-Noahic Commission). The three institutions established by the Creator for the implementation of His purposes in this world (home, government, church) should be honored and supported as such.

In addition to a firm commitment to creationism and to full biblical inerrancy and authority, the ICR Graduate School is committed to traditional education and to high standards of academic excellence. The ICRGS M.S. program is

offered in an online environment, with interaction between instructors and students, and includes a research investigation approved by each department chair (in lieu of a thesis). ICR's highly qualified and experienced faculty is in itself assurance of a rigorous and creative educational experience for its graduates, equipping them both for productive careers in their chosen fields and for making a significant contribution to the ongoing worldwide revival of theistic creationism.