

Review of the proposal of the Institute for Creation Research for a Master's Degree in Science Education

Standard 12 and ICRGS's Stated Purpose

Standard 12 requires that

The quality, content, and sequence of each course, curriculum, or program of instruction, training, or study shall be appropriate to the purpose of the institution and shall be such that the institution may reasonably and adequately achieve the stated objectives of the course or program. Each program shall adequately cover the breadth of knowledge of the discipline taught. . .”

The basic question is whether the proposed ICRGS program and curriculum support and have the potential to achieve their stated purpose and, at the same time, adequately cover the breadth of knowledge of the discipline taught as required by Standard 12. My conclusion is that the program and curriculum do neither.

The purpose of the ICRGS as stated in its proposal 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 (General Catalog 2008-2009, p. 9).

In assessing whether the proposed curriculum and courses meet the purpose of the ICRGS it is necessary to focus on the question of whether the program is successful in integrating proven scientific knowledge into a framework of a biblical perspective and, at the same time, prepare individuals to understand the history and nature of the universe. My assessment, which is informed by the nature of numerous statements in the ICRGS 2008-2009 General Catalog and the accompanying course syllabi, indicates that the biblical perspective that informs and infuses the curriculum and courses is ill-suited to act as an “integrative framework” with the potential to blend the foundational principles of the ICRGS listed on pages 52-54 of the 2008-2009 General Catalog with the scientific knowledge and data regarding the nature and history of the universe. In an attempt to integrate biblical perspective and existing scientific knowledge, the proposed courses select the data and findings that support their perspective and, in the process, ignore the data and findings that contradict their perspective and ideology. Furthermore, the described courses in the sciences fail to provide an adequate breadth of existing knowledge in the geosciences and biological sciences as required by Standard 12.

Standard 12 and Program and Course Descriptions and Objectives

Program objectives and course descriptions provided in the 2008-2009 General Catalog and course syllabi provide evidence that the program's purpose of integrating biblical perspective and scientific knowledge has not been achieved and appears not to have been

intended. Excerpts from the General Catalog and course syllabi are provided to support the reviewer's conclusions.

Masters in Science Education

In defining the uniqueness of the ICRGS's Masters in Science Education Online program, the 2008-2009 General Catalog (p. 50) the following program attributes are noted.

- Teaches science from a creationist perspective;
- Grounds the learner in a biblically-based program in the sciences with science and teaching science as a focus;
- Educates the learner to discern the biblical perspective in science and science teaching;
- Assists the learner in developing creation apologetics in his or her science classroom.

The 2008-2009 General Catalog (p 51) states that one role of instructors in the ICRGS's online program is to determine "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."

The 2008-2009 General Catalog section "Word from the President" written by John D. Morris states

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 (p. 8).

The preceding statements form the foundation of the ICR's ideology and influence the nature of the proposed Masters of Science Education Program and courses.

Science Education Program and Courses

The introductory material for the Department of Science Education in the General Catalog states

ICRGS's program is uniquely positioned and equipped to serve the educational needs of this specialized education market, as the 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 (p. 17)

The first program objective for the science education program specifies, "The ICRGS graduate will be able to integrate content knowledge in science from the evolutionary and creationist perspectives in their curriculum and instruction" (p. 17).

SE 501 Advanced Educational Psychology is a 4.5-quarter hour course described as a "Survey of principles of developmentalism with an emphasis on skills that apply to successful science teaching."

The syllabus of this course available for review in January was edited in the resubmission of the ICR's application. In the process, several objectives in the January document were edited in a significant manner. The underlined portion of an objective represents the portion that was edited out of the January version of SE 502 Educational Psychology with the remaining parts of the statements representing the objectives for the current version of the course.

1. Evaluate theories of cognitive and linguistic development from the Christian worldview.
2. Assess theories of moral and social development from the Christian worldview.
3. Compare and contrast ethnic and cultural theories with Biblical theories.
7. Support teaching students to use higher-level teaching skills to defend a creationist worldview.
10. Describe and defend physical, intellectual, emotional, social and moral development from a Christian worldview.

The editing of these five objectives resulted in somewhat vague statements as students were expected to compare and contrast or describe and defend without knowing the basis for such actions.

The ten modules listed for the course are more appropriate for study in an undergraduate course than a graduate course in Educational Psychology.

Two textbooks are required for the course. One is a widely used and reputable textbook, which is likely to be used more often in undergraduate than graduate courses. Ten quizzes assessing content in this textbook are administered and account for 10% of the final grade. This reviewer is not familiar with the second textbook, which has a title that indicates a focus on developmental perspectives of Christian education. This book is studied through asynchronous online discussions that account for 14% of the final grade.

SE 503 Planning Science Instruction Methods is a 4.5 quarter hour course that focuses on "planning and developing instruction that maximizes and supports learning" through the application of several instructional strategies. The strategies identified are important tools for a science teacher's repertoire. However, most of the strategies listed would typically be emphasized in an undergraduate course.

SE 503 is a revised version of SE 503 Instructional Design, which was included and described with the inventory of courses reviewed in January. Rewording of objectives occurred this revision as noted by the following examples:

1. Design instructional strategies that teach the instructional objectives from a creationist worldview. (January version)
1. Design instructional strategies that teach the origins content from two perspectives. (April version)
2. Design science lesson plans from the creationist worldview using the Engage-Explore-Explain-Extend-Evaluate (5-E) model. (January version)
2. Propose science lesson plans from the creationist perspective using the Engage-Explore-Explain-Extend-Evaluate (5-E) model. (April version)

4. Incorporate questioning strategies into lesson-planning that help students develop an understanding of creation science and discern when creation and/or evolution is being supported. (January version)
4. Incorporate questioning strategies into lesson-planning that help students develop an understanding of science. (April version)
6. Present opportunities for their student students to participate in investigative science by designing lab and field investigations that help them understand scientific biblical truths. (January version).
6. Plan lab and field investigations that present opportunities for their students to participate in investigative science. (April version).

The rationale for the January version of SE 503 stated the following:

The purpose of this course is for the science teacher to learn how to plan, develop, and use a variety of instructional materials, methods, and media for use in quality instruction that focuses on Creation Science. ...

This rationale was edited out in the April version of the SE 503 course syllabus.

The list of modules in the January version of SE 503 was revised and improved for the current version. Four of the five textbooks listed for this course are relevant and supportive of the course objectives. This reviewer is not familiar with the 5th reference, which is *Developmental perspectives on Christian education*, but its contribution to a science methods course is questionable.

The assignments listed in section E are relevant, but don't appear to be aligned with the course grading criteria specified in D-2. Also, most of these assignments would be typically completed in undergraduate courses unless this course is being designed for post-baccalaureate students seeking initial certification. If so this should be specified and reflected in other program requirements and courses.

The textbooks and references listed are appropriate for this course.

SE 502 The Science Curriculum is a 4.5-quarter hour course described as a "Study of curricular trends in science education in the United States, examination of philosophical implications of various approaches to curriculum design, evaluation of current science curricula."

SE 502 represents a revised version of SE 505 Curriculum Design in Science, which was included in the course listing reviewed in January.

The editing of the course objectives was significant as SE 505 was revised to from SE 502. Significant changes were made in the objectives as SE 505 was converted to SE 502. The underlined portions of selected objectives from SE 505 was deleted when objectives for SE 502 were edited. Objectives that replace the earlier ones are noted noted within parentheses.

- Compare and contrast curriculum philosophies in relationship to a Christian worldview.
- Evaluate the national science standards from a creationist perspective. (Portray the history of the development of national science standards.)
- (Assess the importance of the National Science Education Standards NSES)
- Appraise problems science educators encounter in teaching creation and demonstrate how to overcome them.
- Assess critically the importance of each of the science process skills into the biblical creation curriculum.

The ten modules listed for SE 502 are representative of those present in many undergraduate science curriculum courses and in some graduate courses. It is reasonable to expect some emphasis on selected research that pertains to science curriculum in some manner.

Seven different types of assignments are required for the course.

SE 504 Research in Science Education is a 4.5-quarter hour course that is described as a “Survey of the basic principles of science education research through analysis of research in science education.” The course description lists topics that would typically be studied in a graduate research in education course. However, the assignments and 10 modules align better with the topics listed in the description than do the listed objectives. One of the four objectives expects students to be able to “Interpret science education research and describe its implications from a Christian worldview.”

The textbook and listed resources for this course are relevant and current. The assignments and grading criteria seem reasonable.

SE 505 Implementing and Assessing Science Teaching is a 4.5-quarter hour course described as a capstone course that focuses on the “Application and evaluation of content knowledge, instructional and assessment skills in the learning environment.”

The course objectives are structured in a manner that depicts the attributes of an effective science teacher in regard to implementing instruction, student assessment, and self-assessment. The objectives are relevant for such a course. One of the attributes listed indicates an effective science teacher should be able to implement instruction that results in a “Comparison and contrasting of evolutionary and creationist science approaches.” For a variety of reasons that have a pedagogical and legal basis and justification, making such comparisons and contrasts in a public school science classroom are unwarranted.

The assignments and modules listed are appropriate for this course. The discussion board assignment is based on a book that is not listed in references cited in the syllabus. The references provided are appropriate for use in this course.

SE 510 Special Topics in Science Education is described as a “Hands-on course offered as the need arises for various topics in Science Education” that is offered for variable credit.

Overall, this review of the Science Education courses reveals that creationist perspectives are infused throughout.

Chair, Department of Science Education and Course Instructor

Dr. Patricia Nason is the chair of this department and is listed as the instructor for all of the science education courses. She earned her Ph.D. in 1994 at TAMU and has some teaching experience at the elementary and middle school level. Because the Science Education program is designed for middle school and high school science teachers and the breadth and nature of the courses offered, the program is limited by having Dr. Nason as the only instructor. Dr. Nason’s record of research and publication would not qualify her for membership on the Graduate Faculty at Texas Tech University and probably other major Texas universities.

Course Objectives and Content in the Sciences

Information about the Biology program in the 2008-2009 catalog indicates that the graduates who minor in Biology will be able to “demonstrate a depth of biological knowledge as it relates to the creationist perspective” and be able to “proficiently communicate in writing and verbally the significance of biological support from a young earth origins perspective (p. 29).

BI 501 Biological Origins is a 4.5-quarter hour course that focuses on “the various theories of biological origin and diversification” and “all theories are reviewed in light of contemporary biological knowledge.” The objectives for this course are:

1. Analyze the validity of a scientific experiment from origins related literature.
2. Integrate information over a broad spectrum of origins issues.
3. Synthesize a publishable 1800 word essay based on scientific data.
4. Evaluate research material from several fields of biological study.
5. Acquire a broad knowledge base of topics fundamental to the origins debate.

BI 501 is a revised version of BI 505 Biological Concepts, which was included in the courses reviewed in January. The objectives and list of modules were unchanged in the revision. Other than changing the course number and title, the major change was in the references listed in the resource section, which was reduced from 6 pages to less than a page listing several free access periodicals. The BI 505 references were relevant and cited appropriately. The BIO 501 list of free access sites also is useful and the URL for each site is provided.

BIO 501 lists ten modules, which include the following:

- Biological Beginnings Part 1: Organic evolution or God’s building blocks?
- Man and Primates: Is there a monkey in your family tree?

It is difficult to ascertain which theories concerned with origin of life were emphasized in this course. Based on the title of module 1 and the overall thrust of the program, the creation of life through a divine act appeared to be emphasized.

The course description indicated that the diversification of life would be emphasized. However, there is lack of evidence that indicates the diversification of life as depicted by natural selection and evolutionary processes was emphasized in a comprehensive and informed manner.

BI 501L Biological Origins Lab is an intensive, one-week course designed for Middle School and High School teachers, who will earn 3-quarter hours by completing 10 laboratory modules. Students are required to complete this course at the ICR facility in Dallas.

Objectives include the following:

- Acquire a broad biology knowledge base fundamental to the origins debate.
- Identify and use laboratory exercises applicable to the origins debate.

Much of the content emphasized in the ten modules is basic biology that a typical student would have completed in high school biology and introductory college biology courses. Content this reviewer defines as basic includes plant cell structure, plant gross anatomy, photosynthesis, transpiration, asexual reproduction, DNA replication and protein synthesis, the cell structure and physiology of the paramecia, amoeba, and euglena to illustrate irreducible complexity, human inheritance (skin color, blood types dominant/recessive traits, Hardy-Weinberg Equilibrium, Mendel, Homologous organs (chicken breast 7 wing, turtle girdles, fish fins), planarian regeneration, and frog development.

It is difficult to comprehend how these and other topics coalesce to form a graduate course that is described as having an emphasis “on new developments in biotechnology and bioinformatics.” It would appear the content emphasized was selected in order to achieve the course objective to “Identify and use laboratory exercises applicable to the origins debate.”

Bi 502 Comparative Vertebrate Anatomy is a 4.5-quarter hour course with three of its four objectives related to evolution and creationism. These three objectives are:

- Compare and contrast evolution and creation using the major stages of embryology and the accompanying histology.
- Evaluate flaws in the theory of biological evolution.
- Assemble support for creation as a scientific theory using scientific information.

A research paper with “a minimum of 5 pages on a topic relating anatomy to the evolution/creation debate” is required and makes up 20% of the final grade. The remainder of the final grade is to be determined by quizzes, study questions, group discussions, and a final exam.

The content and requirements for this course are not comparable to those in graduate biology courses offered by the major universities in Texas. Furthermore, the content of this course has minimal potential to inform the instruction of biology teachers in Texas and other states

In the course requirements, Dr. Sharon E. Cargo, who is the instructor, states the following:

You may notice that I use sarcasm occasionally to emphasize a point. As an instructor at ICRGS I am “preaching to the choir” and everyone in the class is already a young earth creationist. Sarcasm and anti-evolutionist humor are not appropriate when trying to persuade an evolutionist to change his or her mind. Any discussion about origins is a spiritual battle. As such, facts often have little influence. Your arguments must be presented in a rational and polite manner or you will be dismissed as crackpot. It is our duty to learn as much as possible about evolution to be able to defend creationism.

This statement and the course objectives for BI 502 Comparative Vertebrate Anatomy demonstrate to this reviewer that that the ICR purpose “to prepare science teachers and other individuals to understand the universe within the integrating framework of Biblical creationism using proven scientific data” cannot be achieved in the courses required for a minor in Biology inasmuch as relevant scientific knowledge appears to be rejected rather than integrated by the “framework of Biblical creationism.”

BI 502L Comparative Vertebrate Anatomy is a 1.5-quarter hour lab course, which has ten labs that focus on various Vertebrate classes and “candidates” for their ancestry. Included in this study are the jawless, cartilaginous, and bony fishes, amphibians (mudpuppy & frog), reptiles (turtle), birds (pigeon), mammals (fetal pig and rat), humans and other unusual mammals. It appears the labs that focus on these organisms will be completed online using a digitalized textbook.

The anatomy of these organisms has traditionally been emphasized in high school and introductory college biology courses. However, this emphasis has been decreasing dramatically in recent decades as emphasis is placed on molecular and cellular biology.

The nine references listed in the resource and supplementary material section of the course syllabi are all publications that emphasize creationism.

Overall, it is questionable whether this course should be offered for graduate credit.

BI 503 Principles and Patterns in Paleontology is a 4.5-quarter hour course with nine stated objectives and 10 modules. Many of the objectives focus on different interpretations of the forms of geological evidence that chronicle the earth’s history. Examples of such objectives follow:

- Contrast the many radically different predictions creationist geologists vs. evolutionists geologists made as the study of fossils began.
- Compare and contrast the following examples of evolutionary links vs. creationist mosaics: nautilus, “walking whales,” “mammalian-like reptiles, coelacanth, *Peripatus*, *Archaeopteryx*, “Archaeoraptor,” cycads/“seed ferns,” and algal classification.

- Evaluate creationists vs. evolutionist explanations for the “Cambrian explosion,” mass extinction, “mammalian adaptive radiation,” convergence, “living fossils,” and stasis.
- Relate the “Ice Age:” to post-flood catastrophism and to Florida fossils.

Requirements for the course include 2 tests, a summary essay, inquiry questions, a journal critique that demonstrates ability to “read between the lines,” and a lay presentation or article prepared especially for school or church groups that either contrasts “evolutionary beliefs about human origins with fossil evidence” or relates “dinosaur paleontology to biblical history.”

This course is cross-referenced with GE 503 Principles and Patterns in Paleontology. The modules for both courses are identical except module 5 for BIO 503 is titled Begin Fossil Collection and is followed in the next line with TEST #1. GE 503 lists module 5 as TEST #1, which probably is the result of a copying or typographical error. The objectives for these two courses are the same except for some minor differences. Thus, it could be expected the instructional outcomes of the two courses would be quite similar. As a result, the course rationale provided for the earlier versions (BIO 507 & GE 510 of these two courses reviewed in January is important for this review. This rationale stated in part the following:

While pointing out numerous paleontological contradictions to the evolutionary model, creationist/Flood geologists offer fossil evidence supporting a mosaic/matrix/modular distribution of complete traits pointing toward the historical record of earth history in Scripture: the nearly simultaneous creation of separate complex kinds, subject to struggle and death (“Darwin’s war”) after man’s sin, fossilized rapidly and recently worldwide in Noah’s flood, preserved to repopulate the earth with new life.

The conclusions stated in this rationale about the history of the natural world are contradicted by a vast amount of varied scientific data and evidence and, as a result, have no legitimate place in paleontology and other science courses.

The prerequisites for both courses are identical and require a partial reading of *Creation: Facts of Life* and the viewing of the DVD *From Evolution to Creation*.

The objectives, content, and assignments for this course cannot be considered equivalent to that of a graduate paleontology course in a major university in Texas. Furthermore, the content and requirements for this course reinforce this reviewer’s conclusion that this graduate degree program as conceptualized fails to provide the breadth of coverage expected in such a program. Furthermore, this course reflects the inability of the individual courses in this program to integrate biblical perspectives with existing scientific knowledge in a legitimate manner that results in a course that informs and facilitates the work of science teachers, who are to be served by this program.

BIO 504 Advanced Ecology with Lab is a 6-quarter hour course with the following three objectives:

1. Describe how organisms interact with each other and their environment.

2. Compare and contrast environmental issues from an evolutionary and creation worldview.
3. Convert statements of evolutionary “faith” and creationist faith into scientific statements.

One of the prerequisites for this course is the reading of the book *Creation Facts of Life* by Gary Parker, who designed the course.

The ten modules for this course cover topics usually studied in an undergraduate ecology course.

The course objectives do not reflect the depth and breath of coverage and research-related topics one would expect in a graduate level ecology course. Overall, this course, as defined by the stated objectives, reflects the program’s overall inability to satisfy its goal of using an integrative biblical framework that incorporates scientific knowledge.

BIO 505 Advanced Cell and Molecular Biology is a 4.5-quarter hour course. The five objectives of the course appear to be oriented towards using various comparisons to develop and defend creationist perspectives regarding the nature of living systems. The objectives are:

1. Evaluate the validity of each theory of biochemical origins from the current literature.
2. Compare and contrast competing theories of biochemical origins and distinguish between strengths and weaknesses of each.
3. Develop hypothesis explaining the immutability of biochemical systems from the current literature.
4. Acquire a competent knowledge level of the biochemistry systems frequently used as models for origin of life theories.
5. Synthesize a Creationist paradigm for biochemical differences between created kinds.

Typically, objectives for any course should be conceptualized and stated so that another professional in the field could understand and use them to guide his/her instruction in a similar course. This reviewer suspects that most biology professors in major universities would struggle in using these objectives to inform their instruction in a similar course.

The stated objectives do not provide an adequate breath of study for an advanced cell and molecular biology course. Furthermore, the stated objectives do not provide knowledge about cellular and molecular biology needed by middle and high school teachers, which is unfortunate considering the growing importance of the advancing knowledge in these areas. For example, topics emphasized in the 2006 edition of the high school textbook *BSCS Biology A Molecular Approach* include the genome projects, functional genomics, the polymerase chain reaction, mutations and DNA repair, immune systems, and other emerging areas of study and research. None of these appear to be emphasized in this course or program.

Overall, it would appear the objectives for this course are conceptualized primarily to advance creationist perspectives.

AG 502 Geochronology with Lab is a 6 quarter hour course, which has a “particular emphasis on surveying the use of the radioisotope dating methods” and providing a “review, critique, and evaluation of assumptions and evidences for the age of the earth and its rock layers.” This course is cross-referenced with GEO 512, which is reviewed elsewhere in this document.

This course has a prerequisite requirement of 6 semester hours of calculus, which most science teachers would not have completed.

Among the 10 objectives listed for the course are the following:

- Analyze radioisotope dating methods to discover their critical problems and assumptions in order to argue coherently for a young-earth model.
- Develop an alternative scientific method for incorporating radioisotopic evidence into a young earth framework of earth history.
- Compare and contrast the old-earth and young-earth models of earth history.
- Evaluate claims made by conventional geochronologists and develop a confident personal view of Earth’s history.

These and other objectives for the course are not aligned with the major topics emphasized in secondary school earth science courses and textbooks. As a result, this course would have questionable value to earth science teachers.

Instructions regarding reading and viewing assignments note, “Because of the major contrast between the conventional and Biblical view of earth’s history, all assignments in both conventional and Creationist resources must be completed.”

The only research related assignment for the course is a 10-page report that counts for 10% of the final grade. Some of the parameters of the assignment are as follows:

Each student will write a 10-page report discussing his views on global warming, considering old-earth perspectives, young-earth models, and Biblical constraints. He will discuss concerns about future climate change and how current observations, conventional climate models, and Biblical revelation affect his views.

This assignment is not required for GE 512, which is cross referenced to this course, but it is required for AG 503, which is not cross referenced to this course. The presence of a requirement to specify how biblical revelation affects one’s views in researching and reporting on global warming would not seem to be appropriate for a graduate science course.

Three of the five required textbooks for the course are creationist publications that emphasize that the earth is quite young.

Overall, this course appears to be designed to support creationist arguments for a young earth and, at the same time, reject the very large body of scientific evidence that supports

the conclusion that the earth is 4.5 billion years old. As a result, this course would not contribute to this program's stated goal "to prepare science teachers and other individuals to understand the universe within the integrating framework of a biblical perspective using proven scientific data."

AG 503 Paleoclimatology with Lab is a 6-quarter hour course. Prerequisites for this course include 6 semester hours of calculus, 8 hours in physics, 8 hours in chemistry, and 3 hours of meteorology. Most science teachers could not meet the calculus prerequisite.

The course, in part, focuses on "Descriptions and methods for evaluating current, past, and future climates. One objective states that students at the end of the course should be able to "Evaluate claims made by conventional climate experts and develop a personal view of Earth's climate history." One of the two required textbooks is authored by the course instructor and published by the Institute for Creation Research. All four required video and DVD's are authored by the instructor, produced by the Institute for the Creation Research, and appear to support the premise that the earth is very young.

The only research related assignment for the course is a 10-page report that counts for 10% of the final grade and is the same assignment required for AGE 502 Geochronology with Lab. Some of the requirements of the assignment given for both courses are as follows:

Each student will write a 10-page report discussing his views on global warming, considering old-earth perspectives, young-earth models, and Biblical constraints. He will discuss concerns about future climate change and how current observations, conventional climate models, and Biblical revelation affect his views.

AG 504 Creation Cosmology and the Big Bang Theory is a 4.5 quarter hour course that "teaches the basics of cosmology, outlines the big-bang theory, and contrasts it with several creationist cosmologies."

Course objectives include the following:

- Construct a young earth framework alternative for understanding cosmological data.
- Develop an alternative scientific method for incorporating cosmological data into a young earth framework of history.
- Compare and contrast the old-world and young-world cosmology.
- Evaluate claims made by conventional and young earth cosmologists.
- Express a confident personal view of the history of the heavens in effective, written form using accurate terminology.

Titles of the last two of the ten modules listed for the course are General Biblical Model and Detailed Biblical Model.

Two of the three required textbooks for this course are published by Master Books and reflect the creationist tenet that the earth is young. Neither of these textbooks or the five aforementioned objectives would be a part of a graduate cosmology course in any public university in Texas or the nation.

Instructions regarding reading and viewing assignments, which are in the syllabi of all AG courses, state, "Because of the major contrast between the conventional and Biblical view of earth's history, all assignments in both conventional and Creationist resources must be completed."

The only outside research required for this course is a 4-8 page research paper "on a topic related to the course" that should be "referenced and similar to ICR's Impact Articles."

Overall, this course appears to be designed to support creationist arguments for a young earth and, at the same time, reject the very large body of scientific evidence that supports the conclusion that the earth is 4.5 billion years old. As a result, this course would not contribute to this program's stated goal "to prepare science teachers and other individuals to understand the universe within the integrating framework of a biblical perspective using proven scientific data."

GE 501 Physics and Geology of Natural Disasters is a 4.5 quarter hour course that emphasizes an "analysis of some of the most extraordinary geologic events that have affected the earth's surface" and focuses on "eye-witness reports allowing geologic classification and quantitative description." Prerequisites for the course include 3 semester hours of calculus.

The meaning and use of "eye-witness reports" are not clear to this reviewer.

Course requirements include module quizzes, assigned problems and reviews of case studies, abstract research and writing assignment, and a final examination, which counts for 50% of the final grade. Research papers typically required in graduate courses are not required for this course.

The course consists of ten modules. The final module emphasizes the following three topics:

- The Search for Sodom & Gomorrah
- Amos's Earthquake
- Messiah's Earthquake

A recent article found on the web provides information about Messiah's Earthquake as follows:

According to the prophecy of Zechariah, when the Lord comes to fight against Israel's enemies an earthquake will create a valley through the Mount of Olives, which is west of Jerusalem. (Zech. 14: 1-5) If it levels the area, the problem with the Dome of the Rock and Al-Aqsa will be eliminated. Because the Messiah will rebuild the Temple (Zech. 6:13), these earthquakes may precipitate both the days of the Messiah and the rebuilding the Temple .

(<http://thestateofamerica.wordpress.com/2007/11/25/jerusalem-earthquakes-messiahs-coming-or-end-of-palestinian-state/>) November 25, 2007

It's interesting that this course has specific modules on an earthquake chronicled in the Bible and another predicted in the Bible but no specific module on any of the many important and relatively recent earthquakes that have occurred.

GE 502 Geochronology with Lab is a 6 quarter hour course and is cross referenced with AG 502, which is reviewed elsewhere in this document. The modules listed for this course are not listed on the syllabus for AG 502. Thus, these modules give a reviewer additional knowledge about the course content of both courses. The first two modules and the last one for these two courses are

1. Introduction and Biblical Chronology
2. Scientific Evidence for a young earth
10. An accelerated decay model within a Biblical earth history.

The ten modules listed for GE 502 are the same modules listed in the GE 505 Geochronology syllabus, which was distributed for the January review. The GE 505 syllabus stated the following in the course rationale:

The age of the earth issue is the major battleground in the defense of a literal reading and understanding of the Biblical account of creation, the Fall, and the Flood, which are crucial to correctly understanding and believing the gospel message. The course is designed to give students a good grasp of all the science and evidences involved so they are fully equipped to defend God's Word and to go on the offensive in presenting the case for a God-created young world.

It is important to note the aforementioned rationale is not stated in the GE 502 syllabus. However, because the same modules are used for GE 502 and GE 505 and the overlap of the objectives of these courses, it seems evident that this rationale shapes GE 502 as well.

The term paper required for AGE 502 is not required for this cross-referenced course even though it is the same assignment given to a course (AG 503), which is not cross-referenced with GE 502.

GE 503 Principles and Patterns in Paleontology is a 4.5 quarter hour course that is cross referenced to BI 503 Principles and Patterns in Paleontology, which is reviewed earlier in this document.

GE 504 Interpreting Earth History is a 4.5-quarter hour course that is a "survey of the human quest to understand the earth's past." The course description and two of the ten objectives have a focus on the analysis of uniformitarian and catastrophic approaches to interpreting earth's history.

Prerequisites for this course include calculus and geochemistry. It's unlikely that middle school and high school science teachers have either or both of these courses.

Three of the four required textbooks are published by the ICR and emphasize the catastrophic approach to interpreting earth's history, as does the one required DVD produced by the ICR. Seven of the eight listed resources and supplementary materials are papers presented at four different international conferences on creationism. The fifth

resource is a creationist-oriented book published by Master Books in Green Forest, Arkansas. Thus, mainstream science references receive minimal attention in this course.

It appears that 8 of the 10 course modules are oriented to a young-earth and catastrophist framework whereas modules 2 and 3 focus on The Modern Geological Synthesis, Part I and II. The modules are as follows:

1. Ancient Perceptions of the Earth's Physical History
2. The Modern Geological Synthesis, Part I
3. The Modern Geological Synthesis, Part II
4. Evidences for Catastrophism in the Earth's Past
5. More Evidences for Catastrophism in the Earth's Past
6. A Biblical Model for Geological History: The Pre-Flood World
7. A Biblical Model for Geological History: The Flood and CPT
8. A Biblical Model for Geological History: The Post-Flood World
9. Radioisotope and Other Evidences for a Young Earth and Cosmos
10. Solutions to Challenges for the Catastrophist Framework

The nature of the listed modules makes it quite unlikely that this course would be useful in informing a middle school or high school science teacher in conceptualizing an earth science course inasmuch as 3 of the models are biblical based and most of the others focus primarily on young-earth premises and inferences. Furthermore, the interpretation of the earth's history as reflected in the titles of the modules contradicts the history that has been chronicled as a result of data gathered by a wide variety of approaches and researchers over an extended period of time. Again, the structuring of this course provides no evidence that this program is covering the breadth of the subject matter (Earth History) as required by Standard 12. Likewise, this course provides additional evidence that the program's goal of integrating a Biblical framework with scientific knowledge is unlikely to be achieved unless there is a primary reliance on a narrow body of this knowledge.

The ten modules listed for GE 504 are basically the same as those listed for GE 502 Geology of the Global Flood, which was described in the documents provided for the January review. There also are similarities between the objectives of the two courses. Thus, it appears GE 504 represents a revision of GE 502. The GE 502 Geology of the Global Flood syllabus indicated "The course is designed to give students a good grasp of all the science and evidences involved so that they are fully equipped to defend God's Word and to go on the offensive in presenting the case for a God-created young world." Among the objectives for GE 502 were the following:

- Support the reality of a recent global Flood that destroyed all the terrestrial air-breathing life on earth apart from that preserved in the Ark using multiple lines of Biblical evidence.
- Analyze uniformitarian assumptions and methods to identify and understand their most serious deficiencies in order to argue confidently for a young-earth global Flood interpretation of the geological record.
- Develop a coherent alternative scientific approach to accounting (sic) for the geological record within the Biblical framework of earth history.

Because the modules listed for GE 502 and GE 504 are basically identical, it would appear that GE 504 is designed to achieve the same outcomes cited in the preceding paragraph.

GE 505 Field Biology is a 3-quarter hour field course that features 5 days of “instructional stops” at several sites in Southern California. The field exercises and the field trip paper the students are expected to complete are not described.

SC 501 The History and Nature of Science is a 4.5 quarter hour course that is described as a “Study of historical science and survey of literature of major philosophies of science reveals clashes throughout history” where students “will discover how interpretation of the meaning of the nature of science has affected science as well as the science education system.”

Five objectives are given for this course. The editing of these objectives was poorly done as reflected in the first objective, which states, “Describe several scientific discoveries that were not used for.”

As stated earlier in this review, a person in the field should be able to read an objective and be able to translate it for use in teaching an equivalent course. Certain of the given objectives fail to meet this test. For example, objective 2 states “Evaluate the concepts behind each of the nature of science tenets as they have changed to fit the worldview of particular historical time period (sic)” and objective 3 states “Assess the various tenets of the nature of science to determine how each could be used to undermine and/or support alternative science concepts.” This reviewer, who has completed a graduate course in the history and philosophy of science and has read quite widely in this area during his career, is unable to identify the nature of science tenets referred to in these two objectives. Objective 4 states the learner will be able to “Contemplate the consequences of using the power of inquiry to mess with someone’s mind.” This objective may be referring to the creation of disequilibrium in the thinking of the learner as described by the Swiss psychologist Jean Piaget.

The course consists of ten modules.

The texts and supplementary materials listed for this course seem relevant.

Conclusion

It is difficult to conclude that the proposed program will help science teachers and other individuals understand the universe inasmuch as the ‘integrative’ framework of Biblical creationism, as constituted ignores established scientific evidence that resoundingly refutes this framework. The framework integrates selected scientific data that gives credence to this framework, but ignores, or circumvents, a large body of scientific data that erodes and shatters the foundation of this framework.

Preparing Leadership in Science Education

The second purpose stated for this program is to “prepare our students for leadership in science education.”

The ICR program has not been conceptualized around a set of aims and guiding principles that are designed to prepare science teachers to provide learning experiences that will enhance the scientific literacy of K-12 students and prepare them for science-related careers and a lifetime of informed citizenry. Instead, the program is designed to prepare advocates for creationism, who will be unprepared to deal with the demands and complexities that characterize the professional lives of K-12 teachers of science. Furthermore, they will not be prepared to be leaders in science education and, as a result, an important purpose of the ICR program cannot be achieved through the proposed program.

The on-site evaluation team in its November 8, 2007 report concluded that the program was “plausible” and would be “generally comparable to an initial master’s degree in science education from one of the smaller, regional universities in the state.” This reviewer did not review such programs at all the smaller universities in Texas. However, the graduate program in science education at San Angelo State University was reviewed and the nature of the prescribed coursework and the degree requirements contrast greatly with those being proposed by the ICR. The review team that met January 8 was provided information on graduate degrees in science education offered at the campuses represented by the review team. Again, the program defined by the ICR does not compare favorably with these programs in a number of different ways but, in particular, the program’s potential to meet the needs of science teachers who teach science courses in the various disciplines and work with a very diverse student body, which must be prepared to pursue careers and make decisions in the world of today and tomorrow.

The information provided in April that described several Masters Degree programs in Texas and used to inform comparisons with the ICRGS proposed degree plan was useful, but was incomplete inasmuch as the primary weakness of the ICRGS program is found in the science courses that constitute the various minors. Comparisons with graduate science courses and programs available to teachers through a sampling of Texas universities would be informative.

In addition to the weaknesses and problem related to the science courses that have been described in the preceding pages of this document, it is important to note that the minors as constituted are limited in their potential to contribute to the needed knowledge base of middle school and high school science teachers. The majority of courses are in the area of Astro-Geophysics and Geology. The areas of study emphasized in the eight courses offered in these two areas are poorly aligned with the content of typical courses in middle school and high school earth science courses. The alignment with the earth science standards in the *National Science Education Standards* is also lacking. The alignment of the content of the five courses in the biological sciences with that typically emphasized in high school biology courses and the biology standards in the *National Science Education Standards* is also marginal.

Overall, the Coordinating Board standard requirements that “each program shall adequately cover the breadth of knowledge of the discipline taught and coursework must build on the knowledge of previous courses to increase the rigor of instruction and learning of students in the discipline” are not met by the proposed graduate program and courses. The science courses listed are not comparable either in their design or emphasis with existing graduate science courses at Texas Tech University and undoubtedly other public universities in Texas and the nation. The breadth of knowledge that characterizes the biological and geosciences was not reflected in the individual science courses conceptualized for this program. The lack of needed breadth of knowledge in these science courses is undoubtedly a major reason graduate students pursuing careers in science-related fields are not recruited to enroll.

Allegations of Censorship and Unfairness

Allegations of censorship if this application is rejected have no merit. The creationist tenets that are central to this proposed program were the center of human thought as late as the 1800s. As a result, they were emphasized in science courses at all levels of schooling. However, new discoveries challenged these tenets and they moved from the center of human thought and became more peripheral. When John Hopkins University was created towards the end of the 19th Century, the science department declared that its courses would be free of theological and Biblical tenets and influences. Later, Harvard University made the same decision. Then, as now, secondary school science courses were influenced by and reflected the nature of collegiate science courses. As reflected in the content of science textbooks published in the early 1900s, and the rest of the 20th Century, creationist tenets have not been a part of the science curriculum. The lack of emphasis of creationist tenets in the K-12 science curriculum historically and presently is not the result of censorship, but a result of their consistent failure to provide a coherent and evidence-supported view of the nature and history of the natural world.

The call for science teachers to “teach the controversy” regarding evolution could be used as support for this proposed program for science teachers. However, as stated in the National Academy of Science’s recent report *Science, Evolution, and Creationism*, there are questions about “*how* evolution occurs, not *whether* evolution occurs.” This report also asserted that arguments “suggesting that there are fundamental weaknesses in the science of evolution are unwarranted based on the overwhelming evidence that supports the theory.”

Advocates for the inclusion of creationism and/or intelligent design often use “fairness” as a rationale for this action. The National Academy of Science’s recent report *Science, Evolution, and Creationism* responded to this argument by concluding that “evolution should be taught in science classes because it is the only tested, comprehensive scientific explanation for the nature of the biological world today that is supported by overwhelming evidence and widely accepted by the scientific community.” In contrast, creationist tenets are not supported by evidence and not accepted by the scientific community. The National Science Teachers Association, the world’s largest organization of science teachers, asserts that it is not fair to teach something in science that is false. Finally, it is difficult to define fairness operationally. If it’s fair to introduce tenets of

creationism in the science curriculum, is it fair to introduce satanic or Hindu versions of creation in the public school? Seemingly, it is fair to teach in science classes only those concepts and ideas that are useful in helping students understand the history and nature of the natural world and also help prepare them for science-related careers.

Parental Needs, Prerequisites, and Informal Education

In discussions during the Science Education Masters Program Review Committee on January 7, 2008 it was noted that the ICR indicated that one audience for the proposed program would be parents who home school their children or who want to be better prepared to help their children understand creationist tenets. This reviewer questions how many parents would meet the prerequisites required for many of the courses. For example, many courses require calculus as a prerequisite. In my experiences working as a high school science teacher and a science educator since 1959, I have found that the number of biology and geology teachers who have completed calculus is quite small. I would expect the number of parents who have completed calculus would be smaller. In the Department of Geology, geochemistry and calculus as well as physical geology are listed as prerequisites. It seems highly unlikely that few adults interested in home schooling and parental tutoring would satisfy these prerequisites. I also question whether many of the graduate students enrolled in this program and complete some of the geosciences in this program have completed geochemistry and calculus despite some assurances that such prerequisites are being met.

It seems if the ICR wants to help parents and church school teachers to better understand creationist tenets, informal education opportunities, which do not require calculus and other science-related prerequisites, should be expanded.

Standard 18Bxiv Transfer of Credits

This standard states that “complete and clearly stated information about the transferability of credit to other postsecondary institutions including two-year and four-year colleges and universities” must be provided to students prior to enrollment. This review of the ICR’s catalog did not find any information regarding the transfer out or in of the courses that are part of the proposed degree. Even if such a claim is made regarding the transfer of credit, it is questionable whether the science courses described in this proposal would transfer to a public university in this nation for use in meeting the requirements of a graduate degree in the sciences or science education.

Problems with Constitutional Standards and Judicial Mandates

In the December 2007 report “Initial Response to the Report of Evaluation for the Institute for Creation Research,” an assertion was stated that ICR takes the position that scientific creationism and Biblical creationism are “compatible and that all genuine facts of science support the Bible.” The report then declared that

ICR maintains that scientific creationism should be taught along with the scientific aspects of evolutionism in tax-supported institutions, and that both scientific and Biblical creationism should be taught in Christian schools.”

U. S. courts have ruled that mandates to require either Biblical creationism or scientific creationism in public school science curricula are unconstitutional because all evidence indicates that these mandates tend to be motivated by sectarian rather than secular reasons. In short, these mandates were not made in an effort to improve science education, but rather to advance a particular set of religious beliefs and teaching. Based on the ICR's continued pursuit to have "scientific creationism" taught in tax-supported institutions, one might conclude its leaderships perceives it can successfully circumvent existing judicial rulings. Approval of this proposal by the Coordinating Board would have the potential to assist ICR with this circumvention.

A common tenet in the science courses that are part of the ICR's proposed Master's Degree in Science Education is that the Earth is very young. In answering the question "what evidence is there that the universe is billions of years old?" the 2007 report *Science, Evolution, and Creationism* written and published under the auspices of the National Academy of Science refuted ICR's claim in stating the following:

Several independent dating techniques indicate that the Earth is billions of years old. Measurements of the radioactive elements in the materials from the Earth, the Moon, and meteorites provide ages for the Earth and the solar system. These measurements are consistent with each other and with the physical processes of radioactivity. Additional evidence for the ages of the solar system and the galaxy include the record of crater formation on the planets and their moons, the ages of the oldest stars in the Milky Way, and the rate of expansion of the universe. Measurements of the radiation left over from the Big Bang also support the universe's great age. (p. 51)

The science courses and their embedded content and the overall mission of the Institute for Creation Research (ICR) reject the underlying principle that science works by providing "explanation through natural law." Rather, the courses, course content, and ICR mission are designed to circumvent and/or corrupt this underlying principle of science by persistently advocating and working to have science curricula emphasize that the natural world has been shaped by supernatural decisions and actions. In advocating and advancing this content and mission plus relying on methodology that is characterized by the derivation of deductions from philosophical and dogmatic axioms and the search for evidence to support literal interpretations of Genesis, much of the course content described in the ICR proposal is outside the realm of science and lacks the potential to help students understand the nature of science and the history and nature of the natural world. Furthermore, the program and courses have limited or no potential to increase the readiness of students enrolled in the program to pursue science-related careers in the state, nation, or world. As such the ICR application for authorization by the Coordinating Board for a Master's of Science Education should be rejected.

As already noted the program as structured cannot develop an understanding of the "universe with the integrating framework of Biblical creationism using proven scientific data." The key word in the purpose statement is integration. How can the proposition that the Earth is a few thousand years old provide an integrating framework that accommodates the evidence that the Earth and universe are 4.5 and 14 billion years old, respectively? How can the proposition that the basic kinds of life were created in a single

burst of creation and have gone unchanged except “horizontally” within kinds coexist in a framework with the fossil and molecular evidence that indicates life has changed through time? How can the claim that the universe is 6,000 to 10,000 years old be integrated with the knowledge that starlight we see is coming from objects that are millions of light years away? Overall, the science courses are designed to reject and replace evolutionary theory as well as other selected theories and findings of science. At the same time, the program is designed to facilitate access and give scientific credibility to the creationist tenets, which are not supported by evidence or have the potential to inform further research in the sciences.

The following statement from the website of the Institute for Creation Research reinforces this reviewer’s conclusion regarding the purpose and design of the proposed masters degree.

Today, thousands of creation scientists repudiate any form of molecules-to-man evolution in their analysis and use of scientific data. They can now be found in literally every discipline of science, and their numbers are rising rapidly. Evolutionists are finding it increasingly difficult to maintain the fiction that evolution is "science" and creation science is "religion." Such statements today merely reveal the speaker's own liberal social philosophies—not his or her awareness of scientific facts (<http://www.icr.org/research> accessed 4/10/08)

Gerald Skoog
Co-Director, Center for the Integration of Science and Education Research
Paul Whitfield Horn Professor and Dean Emeritus
College of Education
Texas Tech University
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Gerald Skoog, Co-Director, Center for the Integration of Science and Education Research (CISER) and Paul Whitfield Horn Professor and Dean Emeritus of the College of Education is a science educator with experience as a high school science teacher, an author of secondary science textbooks, a director of several federally-funded curriculum and training projects, a consultant for curriculum projects and schools districts, and a leader in efforts to have evolution covered in textbooks and taught in classrooms in a manner commensurate to its importance as a unifying concept in biology. Skoog has served as president of the Science Teachers Association of Texas (STAT) and is an honorary member. He was President of NSTA in 1985-86 and received the organization’s Citation for Distinguished Service to Science Education in 1994 and the Robert Carleton Award in 2004. Skoog was named a Fellow in the American Association for the Advancement of Science (AAAS) and a charter member of the Texas Science Hall of Fame in recognition of his leadership in science education and his research concerned with evolution education. In 2000, he was named a Paul Whitfield Horn Professor, which is the highest award given to TTU faculty members.

McDonough, Linda

From: David Hillis [dhillis@mail.utexas.edu]
Sent: Tuesday, April 22, 2008 3:21 PM
To: McDonough, Linda
Cc: Curry, Barbara A; C.O. Patterson
Subject: Re: ICR proposal review

I think Dr. Skoog's summary and detailed report is thorough and accurate.

I add only that the evidence in this application clearly indicates that this proposed program is not about science education. Science education emphasizes that science is learning about the unknown from a neutral perspective, relying on observable evidence and experimentation. In contrast, this program is about religion, not science. This program relies on religious authorities and authoritative religious writings (The Bible) to inform students about the natural world, and the literal word of this religious text is accepted even when it conflicts with overwhelming empirical evidence. Clearly, that describes a religious, not a scientific, perspective and course of study. Obviously, religious institutions can offer programs in religious instruction, but they certainly should NOT be called programs in "science education." The ICR program clearly does not meet the standards of the THECB. In particular, the proposed course of study in no way "adequately cover[s] the breadth of knowledge of the discipline taught." The vast majority of the proposed science courses do not resemble any offered for graduate credit by other Texas colleges and universities in breadth, depth, or content, and they would not be acceptable for transfer of credit as a result. The proposed programs of study would in no way adequately prepare students in the field of science education, at any level, and certainly not at the graduate level.

David Hillis

On Apr 11, 2008, at 3:36 PM, McDonough, Linda wrote:

Please read and add your comments. And thanks again for everything.

-----Original Message-----

From: Skoog, Gerald [mailto:gerald.skoog@ttu.edu]
Sent: Thursday, April 10, 2008 10:32 PM
To: Stafford, Joe Dr.; McDonough, Linda
Subject: ICR proposal review

My review is attached. I hope that it will help inform the recommendation being prepared for the committee and Board.

Gerald Skoog
Co-Director, Center for Integration of Science Education & Research
Paul Whitfield Horn Professor & Dean Emeritus

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<ICR review 4_08.doc>

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McDonough, Linda

From: Curry, Barbara A [barbc@utdallas.edu]
Sent: Friday, April 11, 2008 5:37 PM
To: McDonough, Linda; C.O. Patterson; dhillis@mail.utexas.edu; gerald.skoog@ttu.edu
Subject: RE: ICR proposal review

Thank you so much for the incredible amount of work put into this document. Your ability to clearly state the thoughts of the committee is extremely commendable.

Barbara

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800 West Campbell
Richardson, TX 75080

Office 972-883-4008
FAX 972-883-6796

To the world you might be one person, but to one person you might be the world.

-----Original Message-----

From: McDonough, Linda [mailto:Linda.McDonough@THECB.state.tx.us]
Sent: Fri 4/11/2008 3:36 PM
To: Curry, Barbara A; C.O. Patterson; dhillis@mail.utexas.edu
Subject: FW: ICR proposal review

Please read and add your comments. And thanks again for everything.

-----Original Message-----

From: Skoog, Gerald [mailto:gerald.skoog@ttu.edu]
Sent: Thursday, April 10, 2008 10:32 PM
To: Stafford, Joe Dr.; McDonough, Linda
Subject: ICR proposal review

My review is attached. I hope that it will help inform the recommendation being prepared for the committee and Board.

Gerald Skoog
Co-Director, Center for Integration of Science Education & Research Paul Whitfield Horn
Professor & Dean Emeritus College of Education Texas Tech University Lubbock, TX 79409-
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McDonough, Linda

From: C.O. Patterson [cop@mail.bio.tamu.edu]
Sent: Friday, April 11, 2008 6:06 PM
To: McDonough, Linda
Cc: Curry, Barbara A; dhillis@mail.utexas.edu; gerald.skoog@ttu.edu
Subject: Re: FW: ICR proposal review

I have only had time to read hurriedly through Dr. Skoog's analysis and comments. But from what I have read so far, I think it looks VERY GOOD!

I will try to go through it more slowly and carefully tomorrow, but do not expect to make any suggestions for major changes.

C.O.Patterson
Professor of Biology
Texas A&M University
College Station 77843-3258

>-----Original Message-----

>From: Skoog, Gerald [mailto:gerald.skoog@ttu.edu]
>Sent: Thursday, April 10, 2008 10:32 PM
>To: Stafford, Joe Dr.; McDonough, Linda
>Subject: ICR proposal review
>
>My review is attached. I hope that it will help inform the
>recommendation being prepared for the committee and Board.
>
>
>Gerald Skoog
>Co-Director, Center for Integration of Science Education & Research
>Paul Whitfield Horn Professor & Dean Emeritus College of Education
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McDonough, Linda

From: C.O. Patterson [cop@mail.bio.tamu.edu]
Sent: Tuesday, April 22, 2008 3:48 PM
To: McDonough, Linda
Cc: Curry, Barbara A; Moody, Sandra West; Jerry Skoog; David Hillis
Subject: ICR proposal review

I have read Dr. Skoog's report in detail, and agree with what he says.

I am also in complete agreement with Dr. Hillis' comments, and especially his evaluation that "the proposed science courses do not resemble any offered for graduate credit by other Texas colleges and universities in breadth, depth, or content, and they would not be acceptable for transfer of credit as a result. The proposed programs of study would in no way adequately prepare students in the field of science education, at any level, and certainly not at the graduate level."

I have looked closely at several of the "science" courses listed in the proposed curriculum, and wanted to comment specifically on three of these.

BI 501 Biological Origins and BI 501L Biological Origins Lab. The only textbook listed for these linked courses is Campbell & Reece: Biology (Benjamin Cummings Publishing). This is an introductory-level book. We use it for our freshman courses at TAMU. We would not consider this book to be appropriate for Masters-level coursework. Curiously, the syllabus specifies the 6th edition from 2002. The current edition is the 8th, published in 2008. Why is an old edition of a freshman book used for this course, supposedly at a graduate level?

BI 504 Advanced Ecology with Lab The main textbook (Molles: Ecology concepts and applications) is suitable for sophomore-level introductory courses. We use excerpts from it in our BIOL 214 Genes, Ecology and Evolution course at TAMU. We would not consider this book to be appropriate for Masters-level coursework.

BI 505 Advanced Cell and Molecular Biology The required textbook (Lodish et al: Molecular Cell Biology) is a well-respected and widely-used book, often assigned in junior- and senior-level undergraduate courses. It is 973 pages in length. But the book devotes very little space to the topics that are mentioned in the Course Objectives, which focus heavily on questions of "origins" (3 out of 5 objectives plus a 4th objective closely related to origins). Turning to the topics listed in the Course Calendar, there again seems little relation to the depth of coverage in this text. Topic 2 (endosymbiosis) receives only 3 pages in the Lodish book. Topic 7 (Viruses and virulence) is covered in only 8 pages. In this book, discussion of immunity and the immune system is scattered through the book, but appears to total about 10 - 12 pages. It is unclear why this book was chosen rather than a number of more appropriate texts that actually address the topics listed in the course syllabus.

Use of outmoded or inapplicable textbooks, or books intended for lower-level undergraduate courses, would cause us to be very uneasy about accepting transfer credit toward a graduate degree.

If I can provide additional information, please contact me.

C.O. Patterson
Professor of Biology

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