

NATURAL SCIENCE/MATH
TRIENNIAL REVIEW
2016

DEPARTMENT ASSESSMENT PROCESS

1. Gather departmental documents
2. Collect current copy of syllabi
3. Compile master list of all SLO's articulated on syllabi
4. Designate the departmental SLO's met by each learning objective listed on syllabi.
5. Design curriculum map listing classes and SLO's – see pp. 17-30
6. -8. ANALYSIS OF CURRICULUM MAP AND COURSE DESCRIPTIONS - Purpose statements were made for each of the Natural Science Major core courses. (pp. 33-36). These were used along with the course descriptions, curriculum map (p. 5) and curriculum matrix (pp. 17-30) to analyze scaffolding, appropriateness of descriptive vocabulary of course objectives and fit with departmental mission.
 - a. Findings
 - i. The curriculum matrix analysis reveals that the core courses do provide a scaffolding approach in the learning objectives with foundational terms, concepts, and skills being introduced in the 100-200 level courses. These provide students with the tools necessary for subsequent courses. This was apparent by appropriate usage of Bloom's vocabulary and the course descriptions. By the nature of math and science, however, Bloom's levels of application and synthesis are necessary even in the 100-200 level courses as students practice the scientific method and problem solving (e.g. NS-CH 111, NS-MA 111, NS-PH 205, NS-BI 202). In the fourth semester (NS-SM 291) students are required to read and critically evaluate a scientific publication. All majors do a practicum/internship (NS-AP 395 or 495) or project/thesis (NS-AP 493 or 498) requiring higher levels of application and synthesis. Ultimately, all majors take Senior Science Seminar (NS-SM 491) the capstone course of the major. Evaluation of student proficiency is accomplished through a literature review, annotated bibliography, and the design of a research proposal.
 - ii. The development of the purpose statements resulted in alterations of objectives of some courses (particularly in biology and seminar courses). In the future other modifications should be made. For instance, the objectives for NS-PH 205 and 206 should be disaggregated for more effective evaluation.
9. Using the Master list of course learning outcomes, identify the assessment tool used to measure each learning outcome – see document
 - a. Modify, add or remove assessments as needed
 - b. Modify assessments to ensure that they are appropriate to the Bloom's designation for that outcome
 - i. Assessment Matrix
 - ii. Rubric
10. Verify that each dept. Learning Objective has an assessment tool to confirm and assess the objective.
 - a. Findings
 - i. Each Dept. Learning Objective has an assessment tool that assesses it. See Curriculum Matrix.

11. Complete an *Analysis of Program-Level Student Learning Outcomes* for each departmental SLO.

a. Findings

i. Current assessment measures:

1. Senior Seminar Assignments
 - a. Proposal
 - b. Annotated Bibliography
 - c. Presentation
2. Natural Science Seminar Assignments
 - a. Book Critique – written
 - b. Book Critique – Presentation
3. Internship/practica
4. Senior Research Project/thesis
5. Natural Science Department Pre and Post test
 - a. This may be modified in the future – discussed at recent Dept. meeting that assessment is too cumbersome. We will look into disaggregating NS student scores from the Critical Thinking test given to all graduates at the end of their senior year.
6. Scientific Method Comprehension – tested in Gen. Chemistry (2013-96%, 2014 – 100%, 2015 – 100%, 2016 – 95%)
7. Pass Rate Natural Science Seminar (2013-89%, 2014 – 100%, 2015 – 100%, 2016 – 100%)
8. Pass Rate Senior Seminar (2013-89%, 2014 – 100%, 2015 – 100%, 2016 – 100%)
9. 2 yr survey
10. 4 yr survey
11. Persistence – Percent of students completing Natural Science Seminar and also completing Senior Seminar (78% 2006-2016)
12. Percent of graduates who enter a science/math related job or graduate school within 2 years of graduating (77% overall, 85% when corrected for those who did not choose to seek employment or further education 2005-2015)
13. Other information such as ACT scores, GPA's, projects, etc.

- ii. The department retains much valuable information that is useful for assessment. Senior Seminar Assignments and Natural Science Seminar assignments are very useful in determining SLO and Dept goals. Persistence and percent of employed graduates statistics are valuable indicators of the attainment of desired outcomes. The Department needs to evaluate more closely all of the assessment measures and develop a consistent plan for yearly collection and evaluation of necessary data. It should be the aim to determine the minimum number of effective assessments that are easily executed in order to concentrate on effective and enjoyable teaching.

Natural Science and Mathematics Department
Triennial Review – SP 2016

Natural Science and Math Department Mission Statement

The mission of the Natural Science & Math Department at Central Christian College is to educate students in scientific principles and skills, guided by a biblical worldview, in order to produce competent scientists who can think critically, test natural phenomena, and apply truth for the benefit of mankind and the glory of God.

Natural Science and Math Departmental goals:

1. Program majors will have a firm foundation in the principles of natural science and mathematics understanding in the use and limitations of the scientific method. (Fit Body/Fit Mind) – Target - 100%
2. Program majors will evaluate information in the light of science and Christian thought. (Fit Heart) – Target - 100%
3. Program majors will have an appreciation for the beauty and complexity of the Creation and their roles in its study and stewardship. (Fit Soul) – Target - 100%
4. Program graduates within two years post-graduation will be professionally employed and/or furthering their education within their field. (Fit Body/Fit Mind/Fit Soul/Fit Body) – Target - 75%

Natural Science Major Student Learning Outcomes (SLO)

The Natural Science Major will be able:

Fit Mind – Rationally Competent

1. to demonstrate and apply knowledge of terms and concepts employed in the natural sciences
2. to apply scientific method by being able to design, carry out, and write up scientific investigations
3. to be able to think critically and evaluate scientific ideas and investigations

Fit Body – Professionally Astute - skills to succeed (technical and theoretical - i.e. able to apply scientific method)

1. to demonstrate laboratory skills and safety - safety tests, MSDS knowledge
2. to demonstrate use of and apply mathematical concepts
3. to demonstrate the ability to evaluate scientific ideas and studies

Fit Heart (Socially Responsible) Fit Soul (Spiritually Responsive)

1. to articulate ethical positions on controversial scientific issues and apply them to a Biblical world view
2. to demonstrate integrity and responsibility
3. to demonstrate an understanding of the Biblical admonition to subdue the earth and rule over its creatures (i.e. to be stewards of the creation) (Gen. 1:28)

Natural Science and Math Curriculum Map - tying program student learning outcomes (SLO) with the Natural Science Major core courses:

Courses	Intended Student Learning Outcomes – Natural Science Major									
	SLO	FM1	FM2	FM3	FB1	FB 2	FB 3	FHFS1	FHFS 2	FHFS 3
NS-CH 111,112	I,R	I,R	I,R	I,R,A	I,R	I,R	I,R	I,R	I,R	I,R
NS-BI 101,201,202,203	I,R	I,R	I,R	I,R,A	I	I,R	I,R	I,R	I,R	I,R
NS-PH 205,206	I,R	I,R	I,R	I,R,A	I,R	I,R	I,R	I,R	I,R	I,R
NS-MA 111	I,R	I,R			I,R,A		I,R	I,R	I,R	I,R
NS-SM 291	A	A	A			A	A	I,R	I,R	I,R
NS-SM 491	A	A	A			A		I,R	I,R	I,R
NS-AP 493	A	A	A		A	A		A		
NS-AP 495								A		

SLO – student learning outcome; I-introduced; R-reinforced/practiced; A-assessed

Natural Science/Math Department Faculty

Michael Craig, MS

Robin Jackson, PhD

John Trow, PhD

Natural Science (Applied Departmental Studies)

NS-AP 395 Practicum [Natural Science]

This independent study is designed to provide the student with hands-on experience related to the focus of the practicum. The specific elements of the practicum will be decided upon with a faculty advisor and articulated in a learner contract. The student is required to complete 40 hours of work for each credit hour.

NS-AP 493 Research Project [Natural Science]

This independent study is designed to challenge the student in the expansion and integration of acquired coursework and knowledge. Specifically, the course will challenge the student to pursue a topic and begin research under the supervision of a faculty member.

NS-AP 495 Internship [Natural Science]

This independent study is designed to provide the student with on the job training, under the tutelage and evaluation of a practitioner. The specific elements of the internship will be decided upon with a faculty advisor and articulated in a learner contract. The student is required to complete 40 hours of work for each credit hour.

NS-AP 498 Thesis [Natural Science]

The thesis course provides the student with the opportunity to produce original research. The outcome of the course is the development of a thesis that demonstrates the ability to review, analyze, and synthesis information and data related to a hypothesis or research question.

Natural Science (Biology)

NS-BI 100 Environmental Science w/Lab (4)

A course designed to introduce the student to the interrelationships between organisms and their environment with emphasis on how man affects these interactions. Environmental issues such as pollution, resource use, loss of biodiversity, etc. are discussed in light of economic, political, and cultural influences. This is a general education science course for non-majors; however it is useful for majors interested in environmental biology. Three hours lecture, two hours lab per week (Offered alternate years).

NS-BI 101 General Biology w/Lab (4)

An introduction to the principles and concepts of the biological sciences. Coverage includes principles of cell biology, heredity, ecology, creation/evolution issues, and a survey of living things. This course is intended for non-science majors although it may also serve as a foundational course for biology majors.

NS-BI 201 Invertebrate Zoology w/Lab (4)

A study of the chemical and physical organization of cells, development, genetics, and a survey of invertebrates with an emphasis on comparative anatomy, morphology, and physiology. Also included is a study of evolutionary and creationist theories and concepts. It is designed to provide a foundation in animal biology for all those interested in further study in life sciences. Prerequisite- NS-BI 101- G or permission from the instructor (Offered alternate years).

NS-BI 202 Vertebrate Zoology w/Lab (4)

A study of the morphology, physiology, and behavior of the vertebrate animals stressing comparative

anatomy and evolutionary and creationist theories and concepts. It is designed to provide a foundation in animal biology for all those interested in further study in life sciences. Prerequisite- NS-BI 101 or instructor permission. (Offered alternate years).

NS-BI 203 Plant Biology w/Lab (4)

An introductory lab science course which includes a survey of the major plant groups with emphasis on taxonomy and basic concepts of botany. This is a general education course designed to provide a foundation in plant biology for those interested in further study in the sciences. (Offered alternate years)

NS-BI 204 Human Anatomy & Physiology I w/Lab (3)

The first in a series of two courses designed to study the gross and micro structure and function of the major systems of the human body. This course will focus primarily on support and movement systems, communication, control and integrative systems. This course is designed for students who need an introduction to anatomy and physiology. This includes those pursuing pre-medicine, pre-nursing, pre-physical therapy, pre-medical technology, sports science majors and others who have an interest in the material. Prerequisites: Minimum of C in NS-BI 101 or instructor permission. Recommended: NS-CH 102 or NS-CH 111.

NS-BI 205 Human Anatomy & Physiology II w/Lab (3)

The second in a series of two courses designed to study the gross and micro structure and function of the major systems of the human body. This course will focus primarily on endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. This course is designed for students who need an introduction to anatomy and physiology. This includes those pursuing pre-medicine, pre-nursing, pre-physical therapy, pre-medical technology, physical education majors and others who have an interest in the material. Prerequisites: Minimum of C in NS-BI 204.

NS-BI 232 Medical Terminology (2) DS

This course is designed to familiarize the student with terms used within the medical field. Specific attention is given to providing a basis through which to understand the prefix, suffix and roots associated with medical terms, as well as abbreviations. Meanings of terms will also be explored to make the student familiar with both the term and its associated usage.

NS-BI 245 Basic Nutrition w/Lab (4)

This course covers basic human nutritional requirements necessary for good health throughout the life cycle. Emphasis is placed on chemical makeup and sources of nutrients and how they are utilized by the body. Additional topics include weight control, nutritional information sources, nutrition and disease. This course is especially for those interested in allied health careers, family nutrition, or social service. (Offered alternate years during interterm). Course Fee Attached.

NS-BI 304 Microbiology w/Lab (4)

This course covers behavior and activity of microorganisms more or less common in the natural environment. Attention is given to bacteria in milk, water, and sewage. Techniques of staining, culturing, and isolating microorganisms are covered. Prerequisite: NS-BI 101, NS-CH 102 or NS-CH 111 (Offered alternate years).

NS-BI 305 Ecology & Natural History w/Lab (4)

The course is designed to introduce students to basic ecological principles and the wide diversity of

habitats, animal life forms and behavior patterns. It is a lab/field-oriented, upper division course, but is open to all majors. Prerequisites: NS-BI 101 or permission of instructor. (Offered alternate years).

NS-BI 306 Ecology of the Southwest w/Lab (4)

A travel course (about 4,000 miles) involving camping and field studies for 3 1/2 weeks in New Mexico and Arizona. This course covers basic ecological principles unique to the Southwestern U.S. Visits are made to unique areas of biological significance such as Carlsbad Caverns, White Sands National Monument, Saguaro National Park, the Grand Canyon, and others. It is designed for both science and non-science majors. Prerequisite NS-BI 100 (or higher) or instructor permission. (Offered every four years during interterm).

NS-BI 307 Florida Ecology w/Lab (4)

This course is designed as a hands-on lab experience and includes travel, camping, and intensive field study. Biological points of interest include Sanibel/Captiva islands, Corkscrew Cypress Swamp, Everglades National Park, and the Florida Keys. It is designed for both science and non-science majors. Prerequisite NS-BI 100 (or higher) and permission of instructor (Offered every four years during interterm).

NS-BI 308 Ornithology w/Lab (4)

This course is designed to introduce students to the laboratory and field study of birds of the Great Plains. Course topics will include identification, family characteristics, distribution, ecological requirements and behavior. Course activities will include lectures, videos, projects, library research, laboratory work and field trips. Field trips will be taken to Quivira National Wildlife Refuge, Cheyenne Bottoms and several museums and zoos. The course is designed for any student interested in outdoor education, elementary and secondary education, conservation, wildlife biology, national park and nature center work. It is an upper-division science course but is open to all majors. Prerequisite NS-BI 101 and NS-BI 202 (or higher) and permission of instructor (Offered on demand only).

NS-BI 310 Genetics w/Lab (4)

This course is an introduction to the basic concepts, principles, and applications of classical, molecular, and population genetics. Laboratory experiences include work with transmission genetics, *Drosophila* studies, and techniques of DNA manipulation. Prerequisites: NS-BI 202 (or higher) and NS-CH 111 or permission of instructor. (Offered alternate years).

NS-BI 364 (MC) Cell & Molecular Biology w/Lab (4)

The molecular organization, function and evolution of prokaryotic and eukaryotic cells. Lab work includes chromosome analysis, cellular fractionation, cell culture, and electrophoretic studies.

NS-BI 391 Readings in Biology

This course is designed as an independent study course. The intent of the course is to provide an intensive, supervised study of a particular topic in biology (not covered by the current curriculum). The student and sponsoring instructor will develop and submit a learning contract, which will include a description of the subject being covered, materials to be used, schedule of meeting times, and description of a project or paper to be used for final evaluation.

Natural Science (Chemistry)

NS-CH 102 General Chemistry w/Lab (4)

A study of fundamental principles of chemistry and properties of matter. Emphasizes scientific method, relationship of chemistry to the other natural science, and consumer chemistry. Intended primarily for those who have not previously taken a chemistry course. Course Fee Attached.

NS-CH 111 College Chemistry I w/Lab (4)

This is a general inorganic chemistry course and includes detailed studies of the basics of chemistry, atomic and molecular structure, states of matter, solutions, chemical reactions, equilibrium and nuclear chemistry. Laboratory activities support the classroom topics and also include safety, lab techniques and procedures, and instrumentation. Prerequisite: High school chemistry NS-CH 102 or instructor's approval. Course Fee Attached.

NS-CH 112 College Chemistry II w/Lab (4)

This is the second level of a course designed as survey of inorganic chemistry, which includes detailed studies of the basics of chemistry, atomic and molecular structure, states of matter, solutions, chemical reactions, equilibrium and nuclear chemistry. Laboratory activities support the classroom topics and also include safety, lab techniques and procedures, and instrumentation. Prerequisite: NS-CH 111 or instructor's approval. Course Fee Attached.

NS-CH 212 Organic Chemistry I w/Lab (4)

The first course in a two semester sequence of organic chemistry. An emphasis on mechanisms and organic reactions is central to the study. The laboratory portion of the course will focus on the preparation and synthesis, purification, and then analysis of organic compounds. Instrumentation and modern laboratory apparatus will be used. Prerequisites: NS-CH 111 and NS-CH 112. (Offered Alternate years) Course Fee Attached.

NS-CH 307 Biochemistry w/Lab (4)

This course is designed as an introduction to the chemical process associated with the form and function of living matter and will include course work related to acidity, alkalinity, carbohydrates, amino acids, proteins, nucleosides, nucleotides, nucleic acids, DNA and RNA, as well as other associated topics.

NS-CH 312 Organic Chemistry II w/Lab (4)

The second course in a two semester sequence of organic chemistry. An emphasis on mechanisms and organic reactions is central to the study. The laboratory portion of the course will focus on the preparation and synthesis, purification, and then analysis of organic compounds. Instrumentation and modern laboratory apparatus will be used. Prerequisites: NS-CH 212 (Offered alternate years) Course Fee Attached.

NS-CH 345 Nutritional Biochemistry w/Lab (4)

Designed as a survey of metabolic and nutritional functions in relation to biosynthesis and organic functioning. The course will introduce the student to the chemical interactions associated with nutritive values and functioning. Course Fee Attached.

NS-CH 360 Analytical Chemistry w/Lab (4)

The student will be introduced to complex methods of inorganic quantitative analysis. Topics will include methods of gravimetric and volumetric analysis utilizing instrumental methods. Course Fee Attached.

NS-CH 385 Advanced Inorganic Chemistry w/Lab (4)

The student will further develop mastery of the periodic properties of the elements and their associated compounds, as well as develop familiarity with their interactions and reactions. Course Fee Attached.

NS-CH 391 Readings in Chemistry

This course is designed as an independent study course. The intent of the course is to provide an intensive, supervised study of a particular topic in chemistry (not covered by the current curriculum). The student and sponsoring instructor will develop and submit a learning contract, which will include a description of the subject being covered, materials to be used, schedule of meeting times, and description of a project or paper to be used for final evaluation.

NS-CH 400 General Physical Chemistry w/Lab (5)

This course is designed to familiarize the student with the physics of chemical reactions. Topics will range from chemical thermodynamics; kinetic theory of gases; properties of solutions, quantum mechanics, spectroscopy, biophysical spectroscopy, intermolecular forces, macromolecules, and statistical thermodynamics. Lab is required. Course Fee Attached.

Natural Science (Mathematics)**NS-MA 103 Intermediate Algebra (3)**

This course satisfies the prerequisite for College Algebra. It will also help prepare the student for Introduction to Mathematics. Topics include real numbers, variable expressions, first degree equations and inequalities, geometry, linear equations and inequalities in two variables, systems of linear equations, polynomials, factoring, rational expressions, rational exponents and radicals, and quadratic equations.

NS-MA 104 College Algebra (3)

A study of real numbers and their properties, exponents, radicals, algebraic expressions, equations and inequalities (linear and quadratic). Special emphasis is placed on the concept of the function and the graph of a function, operations of functions, and inverse functions, polynomials, and rational functions. Prerequisite: Minimum of C in NS-MA 103, minimum Math ACT score of 20, or instructor permission.

NS-MA 105 College Trig & Analytical Geometry (2, 3)

A study of angles, triangles, trigonometric functions and their graphs, and vectors. Emphasis is placed on applications of trigonometric functions. Prerequisite: Minimum of C in NS-MA 104, minimum Math ACT score of 20, or instructor permission. (Offered alternate years)

NS-MA 111 Calculus I (4)

The first course (one semester) of a three-semester sequence in calculus including studies of graphs, functions, limits, differentiation and applications of differentiation, integration and applications of integration. Prerequisite: Minimum of C in NS-MA 105, minimum Math ACT score of 20, or instructor permission.

NS-MA 201 Survey of Contemporary Mathematics (3)

This course includes a broad survey of math topics including (but not limited to) algebra, logic, geometry, functions, graphs and probability. The historical and cultural aspects of math as well as its importance to modern society are also studied.

NS-MA 209 Statistics (3)

A study of basic concepts and operations in descriptive and inferential statistics. The areas of study will include graphic representation, measures of central tendency and dispersion, probability theory and various significant tests of relationship, association, and correlation. Prerequisite: Minimum of C in NS-MA 104 or permission of instructor.

NS-MA 211 Calculus II (4)

A continuation of Calculus I. The course includes a study of integration, applications of integration, and infinite series. Prerequisite: Minimum of C in NS-MA 111.

NS-MA 212 Multivariable Mathematics (3). Topics include infinite series, three-dimensional geometry, and functions of n -variables.

Prerequisite: NS- MA 211 with a grade of C or better.

NS-MA 310 Research Methods/Applied Statistics (3)

Designed to introduce students to the use of statistical models and formulas used in research methodology and design. Statistical methods are used to analyze data and test results against hypothesis and algebraic models. The student will be introduced to technological tools designed to aid in the translation and presentation of mathematical concepts and outcomes. Statistical topics will include a hands-on approach to correlations, ANOVA, t-tests, regression, probability, standard deviation, central tendency, evaluation of curves, as well as other topics. Use of EXCEL and SPSS is required.

Prerequisite: NS-MA 209 or permission of the instructor.

NS-MA 311 Calculus III (4)

This is the third of three courses in the basic calculus sequence. This course includes the study of vector functions, functions of two or more variables, partial derivatives, quadratic surfaces, multiple integration, and vector calculus including Green's Theorem, Curl and Divergence, surface integrals, and Stoke's Theorem. Prerequisite: Minimum of C in NS-MA 211

NS-MA 314 Advanced Analysis (3, 5) DS

A study of fundamental concepts of analysis, functions of bounded variation, integration, sequences of functions. Fourier series, functions of a complex variable. Prerequisite: Minimum of C in NS-MA 211 or instructor permission.

NS-MA 316 History of Mathematics (2)

This course consists of an exploration of some of the major themes in mathematics—calculation, numbers, geometry, algebra, infinity, formalism—and their historical development in various civilizations, ranging from the antiquity of Babylonia and Egypt through classical Greece, the Middle and Far East, and on to modern Europe. This will include a study of how earlier civilizations influenced or failed to influence later ones and how the concepts evolved in these various civilizations. Contributions from mathematicians such as Archimedes, Descartes, Fermat, Newton, Leibnitz, Euler and Gauss are discussed. Emphasis is given to how mathematics relates across disciplines as well as mathematical connections within the discipline. Prerequisite: Permission of the instructor.

NS-MA 391 Readings in Mathematics

This course is designed as an independent study course. The intent of the course is to provide an intensive, supervised study of a particular topic in mathematics (not covered by the current curriculum). The student and sponsoring instructor will develop and submit a learning contract, which will include a

description of the subject being covered, materials to be used, schedule of meeting times, and description of a project or paper to be used for final evaluation.

NS-MA 411 Differential Equations (4)

Includes the study of ordinary differential equations and linear algebra. The theory of linear systems is explored, as well as theorems associated with existence and uniqueness. Students will also receive an introduction to partial differential equations. Prerequisite: Minimum of C in NS-MA 211. Recommended: NS-MA 311.

NS-MA 412 Advanced Calculus (4)

The course is designed to review the algebraic and topological structure of the real number system. Specific focus will be given to the mastery of one-variable calculus including continuous, differentiable, and Riemann integrable functions and the Fundamental Theorem of Calculus. Other topics will include uniform convergence of a sequence of functions, contributions of Newton, Leibniz, Cauchy, Riemann, and Weierstrass. Prerequisite: Permission of the instructor.

NS-MA 413 Modern Advanced Algebra (3-4)

This course is a one-semester course designed to study the abstract ideas of modern algebra including fields, groups, rings, vector spaces and modules. Within the context of actual concrete problems, which spawned these abstract ideas, is the manner in which these topics will be studied. Rigorous proofs of theorems and applications will be a major topic. Prerequisite: Permission of the instructor.

NS-MA 414 Discrete Mathematics (3-4)

This is a course that provides the mathematical basis for computer science, but it has a much broader mathematical application. This course covers applications in discrete mathematics through the study of logic and proofs, set operations, Venn diagrams, trees, Cartesian products and counting relations, functions and relations, concepts of algorithms, combinatorics, discrete probability, and graphs. Prerequisite: Permission of the instructor.

NS-MA 415 Modern Geometry (3-4)

This is a one-semester course which includes a study of both Euclidean geometric topics (angle measurement, congruence between triangles, similarities between triangles, parallel postulates) as well as non-Euclidean geometry. Other topics include projective geometry, convex figures and other foundations of geometry. Prerequisite: Permission of the instructor.

Natural Science (Physics)

NS-PH 205 General Physics I w/Lab (4)

This course is the first in a two-course sequence, which completes an eight semester hour college algebra based physics block. It meets the requirement for a basic professional level course supporting science majors not needing a calculus based physics course such as those going into pre-med. However, for those planning to take the MCAT, both semesters are needed. Topics covered include mechanics and fluids. Prerequisite: Minimum of C in NS-MA 104 College Algebra or permission of the instructor. Lab is required.

NS-PH 206 General Physics II w/Lab (4)

This course is the second in a two-course sequence, which completes an eight semester hour college algebra based physics block. It meets the requirement for a basic professional level course supporting

science majors not needing a calculus based physics course such as those going into pre-med. However, for those planning to take the MCAT, both semesters are needed. Topics covered include thermodynamics, electricity, and optics. Prerequisite: NS-PH 205. Lab is required.

NS-PH 215 University Physics I w/Lab (5)

This course is the first in a two-course sequence which completes a 10 semester hour calculus based physics block. It meets the requirement for a basic professional level calculus based course supporting engineering, mathematics, and science majors. Topics covered include mechanics and fluid mechanics. Prerequisite: NS-MA 111 or permission of the instructor. Lab is required.

NS-PH 216 University Physics II w/Lab (5)

This course is the second in a two-course sequence which completes a 10 semester hour calculus based physics block. It meets the requirement for a basic professional level calculus based course supporting engineering, mathematics, and science majors. Topics covered include thermodynamics, electricity and magnetism, and optics. Prerequisite: NS-PH 215. Lab is required.

NS-PH 391 Readings in Physics

This course is designed as an independent study course. The intent of the course is to provide an intensive, supervised study of a particular topic in physics (not covered by the current curriculum). The student and sponsoring instructor will develop and submit a learning contract, which will include a description of the subject being covered, materials to be used, schedule of meeting times, and description of a project or paper to be used for final evaluation.

Natural Science (Physical Sciences)

NS-PS 104 Earth Science w/Lab (4)

An introductory study of the concepts and principles of earth science, including geology, oceanography, meteorology, astronomy, and the universe and its origin. This course is required for secondary science education majors and also recommended as a general education science course. Course Fee Attached.

NS-PS 105 Introduction to Astronomy w/Lab (4)

NS-PS 106 Introduction to Astronomy (2)

Through this course, the student will have the chance to discover the amazing science of astronomy and space exploration. Designed as a non-major, general introductory course, students will take a hands-on approach to topics such as Kepler's law, Newton's law, astronomical bodies, cosmology, rocketry, astrophysics, and astronautics. If the course includes KAOS at the Cosmosphere, there is a \$500.00 fee for the course.

NS-PS 305 Meteorology (4)

Designed as an introductory course in the field of meteorology, this course will expose the student to the basic concepts of weather and weather analysis. Topics include atmospheric structure, weather systems, forecasting, severe weather patterns, precipitation, as well as other general topics. Prerequisite: Permission of the instructor.

NS-PS 391 Readings in Physical Science

This course is designed as an independent study course. The intent of the course is to provide an intensive, supervised study of a particular topic in the physical sciences (not covered by the current curriculum). The student and sponsoring instructor will develop and submit a learning contract, which

will include a description of the subject being covered, materials to be used, schedule of meeting times, and description of a project or paper to be used for final evaluation.

Natural Science (Seminar)

NS-SM 291 Natural Science Seminar [SP] (1)

Critical thinking and the use of reasoning are vital to the person who wishes to know the truth and apply it to daily living. To be fully engaged in the process of living and interacting with other people requires the ability to reason logically and think critically. Students undertake both individual and group learning experiences to sharpen and focus their reasoning and thinking skills applied to: a). generally- Christian perspective; and b). specifically- science inquiry and reasoning.

NS-SM 491 Senior Seminar [Natural Science] [FA] (1)

This course is offered to natural science majors and liberal studies majors with science concentrations as a “capstone” course to their undergraduate studies. It is designed to allow the student to review, synthesize and demonstrate knowledge, skills, and attitudes acquired from previous courses, both general education and major courses. It is also intended to prepare the student for transition from college to post-college life (graduate school, job, etc.).

Natural Science Major - Core Course Checklist

Natural Science (Chemistry)

- NS-CH 111 College Chemistry I w/Lab (4)
- NS-CH 112 College Chemistry II w/Lab (4)

Natural Science (Biology)

- NS-BI 201 Invertebrate Zoology w/Lab (4)
- NS-BI 202 Vertebrate Zoology w/Lab (4)
- NS-BI 203 Plant Biology w/Lab (4)

Natural Science (Physics)

- NS-PH 205 General Physics I w/Lab (4)
- NS-PH 206 General Physics II w/Lab (4)

Natural Science (Mathematics)

- NS-MA 111 Calculus I (4)
- NS-MA 211 Calculus II (4)

Natural Science (Seminar)

- NS-SM 291 Natural Science Seminar [SP] (1)
- NS-SM 491 Senior Seminar [Natural Science] [FA] (1)

Natural Science (Applied Departmental Studies)

- NS-AP 395 Practicum [Natural Science]
 - NS-AP 493 Research Project [Natural Science]
 - NS-AP 495 Internship [Natural Science]
- NS-AP 498 Thesis [Natural Science]

CURRICULUM MATRIX AND ANALYSIS

NS-CH 111 College Chemistry I				
	Dept. SLO	Bloom's Taxa		Assessment*
NS-CH 111	FML, FM2, FB2	K, A	Understand the nature of chemistry and matter.	T, Q, L, PP
NS-CH 111	FML	K, A	Demonstrate understanding of fundamental chemical laws	T, Q, L, PP
NS-CH 111	FML, FB2	K, A	Be able to solve problems using stoichiometric relationships and identify types of chemical reactions: Stoichiometry	T, Q, L, PP
NS-CH 111	FML, FB2	K, A	Understand the basic relationships and calculations involving common gas laws	T, Q, L, PP
NS-CH 111	FML, FM3	K, A	Understand basic Thermodynamics	T, Q, L, PP
NS-CH 111	FML, FM3, FB2	K, A	Understand modern atomic structure and its relationship to the electron in developing a three-dimensional, molecular geometry of a compound: Atomic Structure and Periodicity.	T, Q, L, PP
NS-CH 111	FML, FM3, FB2	K, A	Understand modern atomic structure and bonding and molecular geometry	T, Q, L, PP
NS-CH 111	FML, FM3, FB2	K, A	Be able to write Lewis structures for molecules and ions	T, Q, L, PP
NS-CH 111	FML, FM3, FB2	K, A	Be able to use formal charges to evaluate alternative Lewis structures.	T, Q, L, PP
NS-CH 111	FML, FM3, FB3	K, A	Be able to predict the polarity of a molecule.	T, Q, L, PP
NS-CH 111	FML, FM3, FB2	K, A	Descriptive- Describe the general characteristics of radical species and how some radicals affect our lives.	L, A, D
NS-CH 111	FB1, FHFS2	K, A	To enable students to understand accuracy and competency are foundational in the professional practice of chemistry	L, A, D
NS-CH 111	FM2, FB2, FHFS2, FHFS3	K, A	To teach students to solve problems and present solutions in a clear, concise, professional manner	L, A, D
NS-CH 111	FHFS2	K, A	Students will demonstrate effective communication and interpersonal skills	L, A, D
NS-CH 111	FHFS1, FHFS3	K, A	Students will evaluate how awareness and knowledge of chemistry can increase the ability to make rational and competent decisions	A
NS-CH 111	FM2, FHFS1, FHFS2	K, A	Students will evaluate and understand collaborative work and problem solving within the group context	D
NS-CH 111	FHFS1, FHFS3	K, A	Students will demonstrate an understanding of chemistry and its relationship to stewardship of the earth and environment	L

* (T - Tests [unit and final tests], Q - Quizzes, L - Lab written work [notebooks], PP - practice problems, A - Abstracts, D - discussions)

NS-CH 112 College Chemistry II				
	Dept. SLO	Bloom's Taxa		Assessment*
NS-CH 112	FM1, FB2	K, A	Understand basic bonding theories.	T, Q, L, PP
NS-CH 112	FM1	K, A	Understand properties of states of matter.	T, Q, L, PP
NS-CH 112	FM1, FM3, FB1	K, A	Understand the chemistry of solutions.	T, Q, L, PP
NS-CH 112	FM1, FM3, FB1	K, A	Understand theories of chemical reactions.	T, Q, L, PP
NS-CH 112	FM1, FM3, FB1, FB3	K, A	Understand chemical equilibrium.	T, Q, L, PP
NS-CH 112	FM1, FB1, FB3	K, A	Understand theory of acid/base chemistry.	T, Q, L, PP
NS-CH 112	FM1, FM3, FB3	K, A	Understand the laws of thermodynamics.	T, Q, L, PP
NS-CH 112	FM1, FM3, FB3	K, A	Understand electrochemistry.	T, Q, L, PP
NS-CH 112	FB1, FHFS2	K, A	To enable students to understand accuracy and competency are foundational in the professional practice of chemistry	L, A, D
NS-CH 112	FM2, FB2, FHFS2, FHFS3	K, A	To teach students to solve problems and present solutions in a clear, concise, professional manner	L, A, D
NS-CH 112	FHFS2	K, A	Students will demonstrate effective communication and interpersonal skills	L, A, D
NS-CH 112	FHFS1, FHFS3	K, A	Students will evaluate how awareness and knowledge of chemistry can increase the ability to make rational and competent decisions	A
NS-CH 112	FM2, FHFS1, FHFS2	K, A	Students will evaluate and understand collaborative work and problem-solving within the group context	D
NS-CH 112	FHFS1, FHFS3	K, A	Students will demonstrate an understanding of chemistry and its relationship to stewardship of the earth and environment	L

*[T - Tests [unit and final tests], Q - Quizzes, L - Lab written work [notebooks], PP - practice problems, A - Abstracts, D - discussion]

NS-PH 205 General Physics I				
	Dept. SLO	Bloom's Taxa		Assessment*
NS-PH 205	FM1, FM3, FB2	K, A, S	Upon completion of this course, the student should be able to: 1. Demonstrate the effective use of college algebra and trig in the solution of physics problems;	T, L, PP
NS-PH 205	FM2, FM2, FM3, FB1, FB2, FB3	K, A, S	2. Demonstrate basic lab skills during the collection of experimental data and use physics instructional software to analyze, interpret, and report lab findings.	L, PP
NS-PH 205	FM3, FB3, FHFS3	K, A, S	3. Understand how concepts and methods of basic physics can be applied to the everyday world, to decision making, and how the world around us can be better sustained through physical understanding.	T, L

*T - Tests, L - Lab written work, PP - practice problems)

NS-PH 206	General Physics II				
	Dept: SLO	Bloom's Taxa			Assessment*
			Upon completion of this course, the student should be able to:		
NS-PH 206	FM1, FM3, FB2	K, A, S	1. Demonstrate the effect use of college algebra and trig in the solution of physics problems;		T, L, PP
NS-PH 206	FM2, FM2, FM3, FB1, FB2, FB3	K, A, S	2. Demonstrate basic lab skills during the collection of experimental data and use physics instructional software to analyze, interpret, and report lab findings.		L, PP
NS-PH 206	FM3, FB3, FHFS3	K, A, S	3. Understand how concepts and methods of basic physics can be applied to the everyday world, to decision making, and how the world around us can be better sustained through physical understanding.		T, L

*[T - Tests, L - Lab written work, PP - practice problems]

NS-MA 111 Calculus I				
	Dept. SLO	Bloom's Taxa		Assessment*
			FIT MIND	
			<u>Knowledge</u>	
			<i>The student will be able to:</i>	
NS-MA 111	FM1, FM3, FB2	K, A, S	1. understand, construct, and interpret graphs of single and multi-variable functions in rectangular and non-rectangular coordinate systems	T, PP
NS-MA 111	FM1, FM3, FB2	K, A, S	2. understand both continuous and discrete functions, series and sequences and to use the attributes of functions to model and solve real life problems	T, PP
NS-MA 111	FM1, FM3, FB2	K	3. understand the concepts of limits and continuity	T, PP
NS-MA 111	FM1, FM3, FB2	K	4. understand parametric curves	T, PP
			FIT BODY	
			Skills	
			<i>The student will be able to:</i>	
NS-MA 111	FM1, FM3, FB2	K, A, S	1. solve and formulate problems by using different strategies to verify results, interpret results, selecting appropriate technology and concrete materials, and modeling mathematical thinking	T, PP
NS-MA 111	FM1, FM3, FB2	K, A, S	2. organize and express written as well as orally, using mathematical notations and symbols, mathematical thinking/problem solving through various types of reasoning and methods of proofs to explore mathematical questions and conjectures, formulate counterexamples, and generalize solutions	T, PP
NS-MA 111	FM1, FM3, FB2	K, A, S	3. demonstrate the integration of concepts and problem solving in calculus that are inherent in and apply to other disciplines.	T, PP
			FIT HEART & FIT SOUL	
			<i>The student will be able to:</i>	
NS-MA 111	FHFS2, FHFS3	A, S	1. relate the knowledge of calculus concepts to problem solving ability on both a community (local) and world-wide (global) scale	T, PP

*(T - Tests, PP - practice problems)

NS-MA 211 Calculus II				
	Dept. SLO	Bloom's Taxa		Assessment*
			FTT MIND	
			Knowledge	
			<i>The student will be able to:</i>	
NS-MA 212	FM1, FM3, FB2	K, A	1. To demonstrate knowledge of working with different formulas for differentiation and integration.	T, Q, PP, CG
NS-MA 212	FM1, FM3, FB2	K, A	2. To learn and apply various techniques of integration.	T, Q, PP, CG
NS-MA 212	FB2, FB3	K, A	3. To understand both continuous and discrete functions, series and sequences and to use the attributes of functions to model and solve real life problems.	T, Q, PP, CG
NS-MA 212	FB2, FB3	K, A	4. To understand and apply concepts of problems with conic sections.	T, Q, PP, CG
NS-MA 212	FB2, FB3	K, A	5. To understand parametric curves.	T, Q, PP, CG
NS-MA 212	FM1, FM3, FB2, FB3	A	6. To solve and formulate problems by using different strategies to verify results, interpret results, selecting appropriate technology and concrete materials, and modeling mathematical thinking.	T, Q, PP, CG
NS-MA 212	FM1, FM3, FB2, FB3	A, S	7. To organize and express written as well as orally, using mathematical notations and symbols, mathematical thinking/problem solving through various types of reasoning and methods of proofs to explore mathematical questions and conjectures, formulate counterexamples, and generalize solutions.	T, Q, PP, CG
NS-MA 212	FB2, FB3, FHFS 1	A	8. To demonstrate the integration of concepts and problem solving in calculus that are inherent in and apply to other disciplines.	PP, CG
NS-MA 212	FHFS1, FHFS2, FHFS3	A	9. To relate the knowledge of calculus concepts to problems solving ability on both a community (local) and world-wide (global) scale.	PP, CG

*T - Tests [unit and final tests], Q - Quizzes, PP - practice problems, CG - Course Grade)

MASTER KEY

T - Tests, LT - Lab Test, Q - Quizzes, L - Lab written work, PP - practice problems, A - Abstracts, D - discussions, P - Project, AB - Annotated bibliography,
RP - Research proposal, J - Journal, RS - reflection summary, SE - Supervisor Evaluation, CG - course grade

Appendix

Natural Science Major - Core Course Checklist

Purpose Statements to aid in course objective creation.

Five Purpose questions:

1. What role does this course play within the major?
2. How is the course unique or different from other courses?
3. Why should/do students take this course? What essential knowledge or skills should they gain from this experience?
4. What knowledge or skills from this course will students need to have mastered to perform well in future classes or jobs?
5. Why is this course important for students to take?

Natural Science (Chemistry)

- NS-CH 111 College Chemistry I w/Lab (4)**
 - This course provides the chemistry component to the natural science major.
 - This course is unique because general chemistry principles are learned as they relate to biotic and abiotic components of the Creation.
 - All natural science majors take this course as the chemistry component of the major. NS majors will gain chemistry laboratory skills, and an understanding of the elements and their behavior which is essential to understanding life processes and the physical make-up of the universe. Students will also gain knowledge of the mathematical nature of chemistry.
 - The student should master lab skills, an understanding of chemical laws and applicable math processes. These are foundational for all further work in the sciences.
 - This course is important to take because it provides a foundation in chemistry.

- NS-CH 112 College Chemistry II w/Lab (4)**
 - This course is a continuation of the previous course. It provides the chemistry component to the natural science major.
 - This course is unique because general chemistry principles are learned as they relate to biotic and abiotic components of the Creation.
 - All natural science majors except those with a math emphasis are required to take this course. NS majors will gain chemistry laboratory skills, and an understanding of the elements and their behavior which is essential to understanding life processes and the physical make-up of the universe. Students will also gain knowledge of the mathematical nature of chemistry.
 - The student should master lab skills, an understanding of chemical laws and applicable math processes. These are foundational for all further work in the sciences.
 - This course is important to take because it provides a foundation in chemistry.

Natural Science (Biology)

- NS-BI 201 Invertebrate Zoology w/Lab (4)**

- This course provides the biology (life science) component to the natural science major.
 - This course is unique because biological principles are learned in the context of invertebrate animals.
 - Natural science majors should take this course as the biology component of the major. Those NS majors with biology or health science emphases take this course to learn characteristics that pertain to 99% of animal species.
 - The student should master major biological principles and lab skills as they relate to invertebrate animals.
 - This course is important to take because it provides a foundation in the biological sciences.
- **NS-BI 202 Vertebrate Zoology w/Lab (4)**
- This course provides the biology (life science) component to the natural science major.
 - This course is unique because biological principles are learned in the context of vertebrate animals.
 - Natural science majors should take this course as the biology component of the major. Those NS majors with biology or health science emphases take this course to learn dissection skills and comparative anatomy.
 - The student should master major biological principles as they relate to vertebrate animals.
 - This course is important to take because it provides a foundation in the biological sciences.
- **NS-BI 203 Plant Biology w/Lab (4)**
- This course provides the biology (life science) component to the natural science major.
 - This course is unique because biological principles are learned in the context of plants.
 - Natural science majors should take this course as the biology component of the major. Those NS majors with biology or health science emphases take this course to learn characteristics and taxonomy of plants and the dependency of life on green organisms.
 - The student should master major biological principles and lab skills as they relate to plants.
 - This course is important to take because it provides a foundation in the biological sciences.

Natural Science (Physics)

- **NS-PH 205 General Physics I w/Lab (4)**
- This course provides the physics component to the natural science major.
 - This course is unique because general physics principles are learned as they relate to the Creation.
 - All natural science majors take this course as the physics component of the major. NS majors will gain physics laboratory skills and an understanding of the physical universe, particularly mechanics and fluids. Students will also gain mathematical problem solving skills related to physics.
 - The student should master lab skills, physics concepts, and math problem solving skills. These are foundational for further work in the sciences.

- This course is important to take because it provides a foundation in physics and it is necessary for pre-med and other pre-allied health students.
- **NS-PH 206 General Physics II w/Lab (4)**
 - This course is a continuation of the previous course. It provides an additional physics component to the natural science major. It is required for all NS majors except the biology emphasis for whom it is an elective.
 - This course is unique because general physics principles are learned as they relate to the Creation.
 - NS majors will gain physics laboratory skills and an understanding of the physical universe, particularly thermodynamics, electricity, and optics. Students will also gain mathematical problem solving skills related to physics.
 - The student should master lab skills, physics concepts, and math problem solving skills. These are foundational for further work in the sciences.
 - This course is important to take because it provides a foundation in physics and it is necessary for pre-med and other pre-allied health students. **Natural Science (Mathematics)**
- **NS-MA 111 Calculus I (4)**
 - This course provides the mathematics component to the natural science major.
 - This course is unique because it focusses on the processes of Calculus as they relate to the study of science and understanding of the order of Creation.
 - All natural science majors take this course as the mathematics component of the major. NS majors will gain problem solving skills related to graphs, functions, limits, differentiation and applications of differentiation, integration and applications of integration.
 - The student should master mathematical skills that are foundational for further work in the sciences.
 - This course is important to take because it provides a foundation in calculus.
- **NS-MA 211 Calculus II (4)**
 - This course required for math emphasis NS majors but an elective for all other NS majors. It provides an additional mathematics component to the natural science major.
 - This course is unique because it is a continuation of Calculus I.
 - Students should take this course to gain further understanding of Calculus. Students will gain problem solving skills related to integration, applications of integration, and infinite series.
 - The student should master mathematical skills related to integration, applications of integration, and infinite series.
 - This course is important to take to prepare the student for further courses in calculus.

Natural Science (Seminar)

- **NS-SM 291 Natural Science Seminar [SP] (1)**
 - This course provides a critical thinking component to the natural science major. It is designed as preparation for upper level science classes.
 - This course is unique because students are required to read and critique a scientific work and present it to the class.
 - Natural science majors are required to take this course. Students will master vocabulary, practice critical thinking and learn how to critique a scientific work.
 - The student should gain skills in critical thinking for future science courses.
 - This course is important to take in preparation for critical thinking required in upper level science courses.

- **NS-SM 491 Senior Seminar [Natural Science] [FA] (1)**
 - This course is the capstone course for all NS majors
 - This course is unique because students are required to read scholarly articles, construct an annotated bibliography, write a research proposal, and present it to the class. Natural science majors are required to take this course.
 - Students will utilize skills from previous science courses to design and write a research proposal in proper scientific form using CSE citation form. Students will receive feedback and revise their work.
 - The student should gain skills in critical thinking and writing.
 - This course is important to take in preparation for jobs or further schooling in the sciences.

Natural Science (Applied Departmental Studies)

- **NS-AP 395 Practicum [Natural Science] or NS-AP 495 Internship [Natural Science]**
 - A practicum/internship is required (unless a research project is done) for all NS majors
 - This course is unique because students gain first-hand experience in a science-related field (ideally in realm of their future vocation).
 - Students should take this course to get first-hand experience/job training in their anticipated vocational field. For admission to some programs students are required to have a specified number of hours of observation/working in the field.
 - The student should gain skills pertaining to their desired vocational choice and a realistic sense of the nature of that job.
 - This course is important to take in preparation for jobs, resume building, and to meet graduation requirements.

- **NS-AP 493 Research Project [Natural Science] or NS-AP 498 Thesis [Natural Science]**
 - A research project or thesis is required (unless a practicum/internship is done) for all NS majors
 - This course is unique because students gain first-hand experience in designing and carrying out empirical research.
 - Students should take this course to get first-hand experience doing scientific research. This is desirable for those applying to graduate school. The student should gain skills

related to a specific area of scientific research (i.e. chemical analysis, microbiology, biological field research, etc.)

- This course is important to take for practical research experience in preparation for further education and to meet graduation requirements.

NAME
TITLE

Proposal Grade Form

	Poss.	Score	Comments
Proposal			
1. Intro – Observation (basis for question)	10	0	
background info/rationale hypothesis stated			
2. Materials/methods	10	0	
experimental design logical tests hypothesis sound logic			
3. Results sound predictions	4	0	
4. Discussion possible weaknesses further study	3	0	
5. Writing Skills spelling grammar/sentence structure citations	3	0	
Total	30		

Comments:

▪

Name

Date

ANNOTATED BIBLIOGRAPHY GRADE FORM

Annotated Bibliography	Comments	Possible 30
1. List of Sources (8 minimum) a. First pages of articles b. Quality & appropriateness of articles (8)		0
2. Bibliographic Citations – using CSE format (8)		0
3. Annotations a. Summary b. Evaluation (14)		0
TOTAL		0

COMMENTS:

•

Proposal Presentation Grade Form

	Poss.	Score	Comments
Proposal Presentation			
1. Intro	5		
background info			
rationale			
2. Materials/methods	5		
explanation clear			
sound logic			
3. Results	2.5		
4. Discussion	2.5		
5. Powerpoint	5		
Total	20		

Comments:

Name

Date

Title of work

**NATURAL SCIENCE SEMINAR
WRITTEN CRITIQUE EVALUATION FORM**

Introduction (10)	
Identification of work (10)	
Synopsis of work (20) Author's thesis Important ideas Arguments	
Evaluation of work (30) Presenter's reaction or opinion Support for opinions (examples, logic, facts)	
Concluding Analysis of work (20) Value of work to the field - So What? Worldview	
Grammar/Sentence Structure (10)	
TOTAL (100)	

COMMENTS:

The numbers and comments on this form represent composite scores of all of the evaluators who participated. Comments on your written critique were made on turnitin.com. The final score for your critique is an average of your oral presentation and your written critique.

Name

Date

Title of work

**NATURAL SCIENCE SEMINAR
ORAL PRESENTATION EVALUATION FORM**

Introduction (10)	
Identification of work (10)	
Synopsis of work (20) Author's thesis Important ideas Arguments	
Evaluation of work (30) Presenter's reaction or opinion Support for opinions (examples, logic, facts)	
Concluding Analysis of work (30) Value of work to the field - So What? Worldview	
TOTAL (100)	

COMMENTS:

Triennial review observations/accomplishments

1. Biology syllabi need to have more Bloom's verbage
2. Curriculum map – created in 2004
 - a. Should be conserved but possibly add M for mastered
 - b. Should be modified to reflect Bloom's K, A, S (Knowledge, Application, Synthesis)
3. Some syllabi need fewer major objectives/outcomes – best practice seems to be 5-10
4. Physics needs to disaggregate some objectives
5. Revised Department major checklists to reflect new offerings
6. Organized senior seminar projects – stored in a dedicated file drawer.
7. Organized senior research projects – stored in a dedicated file drawer.
8. Organized NS seminar critiques – stored in a dedicated file drawer.
9. Created purpose statements for core courses in major

INSTRUCTIONS HOW TO MANIPULATE OBJECTIVE DATA IN EXCEL

1. Highlight SLO column and click on filter (Make certain to highlight one row above what you want to filter – upper right of screen)
2. This will create an arrow in the upper right of your selection
3. Click arrow and select Text Filters – then Contains from the drop down menu
4. In the menu type in the text you want filtered – i.e. FM1
5. Click OK and voila – everything is eliminated but what you want.
6. You can clear the filter by clicking on the arrow again or going to filter in the upper right corner.