DATE: November 12th , 2015

TO: Department of Science and Math

FROM: Andrew Overholt

RE: Academic Proposal for General Education Physical Science Offerings

PROPOSAL: We propose altering the content in the current classes Physics in Everyday Life and Chemistry in Everyday Life, as well as the elimination of Earth and Space Science and Foundations of Physics and Chemistry

Rationale:

1. The current schedule of general education physical science classes is unsustainable with current faculty. This has occurred due to a loss of faculty in the area of science education.
2. Under the current paradigm, four general education classes are required to teach the four subjects necessary for Elementary Education majors. We propose rearrangement of these subjects to necessitate only two classes; without increasing the number of classes required by these students.
3. We believe it is a better missional fit for MNU to have full time professors teaching the classes with the largest exposure to the school instead of attempting to cover these classes with adjuncts.
4. These changes would not require students to take the same subject multiple times, as was the case with previous offerings of multiple-subject classes (i.e. Concepts in Physical Science)
5. Integration of these topics into the current classes of Physics in Everyday Life and Chemistry in Everyday Life is easier than the alternatives, as the larger subjects of Physics and Chemistry are more difficult to cover appropriately together in a single semester.
6. This change would require increasing the number of times Chemistry in Everyday Life from one time per year to one time per semester. This would allow students additional options in obtaining their General Education credits, while simultaneously allowing Elementary Education majors increased flexibility in obtaining their necessary classes.
7. Elementary Education students who have taken one of the previous courses (Earth & Space/Foundations of Physics and Chemistry) will be given the opportunity to take the other during the 2016-2017 school year through directed study. This will either be completely outside of class, or will include the student sitting in for partial semesters of the new classes depending on student and professor schedule.

Major Changes: Removal of GNSC 2303 and GNSC 2503.

Catalog Descriptions: GNSC 2203 Physics in Everyday Life

A conceptual introduction to the primary concepts from Newtonian physics and astronomy including kinematics, dynamics, conservation laws, universal forces, waves, planets, stars, and cosmology. The emphasis of this course is scientific literacy and the role of science in society. This course assumes no prior knowledge of physics and is designed primarily for persons in the liberal arts. Does not apply to a major in physics, chemistry, or pre-medicine. Prerequisite: Eligibility for enrollment in MATH 1203 (College Algebra). Fall and Spring.

GNSC 2103 Chemistry in Everyday Life

An introduction to the basic concepts of chemistry and earth science including: the periodic table, atomic structure, molecular bonding, geology, oceanography, and meteorology. The emphasis of this course is scientific literacy and the role of science in society. This course assumes no prior knowledge of chemistry and is designed primarily for persons in the liberal arts. Does not apply to a major in chemistry, biology, pre-medicine, or nursing. Prerequisite: MATH 1103 or permission of instructor. Fall and Spring

Staffing Impact: This will require one fewer 3 hour class to be taught every academic year

Funding Impact: A net gain of one 3 hour adjunct salary (~3000) a year

Library Resources Impact: No change in library resources.

Other Impacts: Alteration of Elementary Education major to require Physics in Everyday Life and Chemistry in Everyday Life instead of the current requirements of Earth and Space Science and Foundations of Physics and Chemistry

Actions Taken:

**Department of Science and Mathematics: 11/12/15 *Approved*** *Rejected Tabled Sent Back*

**CLAS Curriculum Committee: 11/20/15 *Approved*** *Rejected Tabled Sent Back*

**CLAS Faculty: 11/30/15 *Approved*** *Rejected Tabled Sent Back*

**General Education Committee: 12/3/15** *Approved Rejected Tabled Sent Back*

**AAC**  *Approved Rejected Tabled Sent Back*

**Faculty Assembly**  *Approved Rejected Tabled Sent Back*

**GNSC 2203 Syllabus**

**Instructor Name: Andrew Overholt, PhD.
Semester/Year: Fall 2014
Class location: Cook 115
Class Meeting time(s): TR 12:15-1:30**

**Office location: Osborne 205
Telephone: 913-971-3675
Email: acoverholt@mnu.edu**

This syllabus represents my current plans and objectives.  As we go through the semester, those plans may need to change to enhance the class learning opportunity.  Such changes, communicated clearly, are not unusual and should be expected.

# Course Description:

 A brief, conceptual overview of the primary concepts from Newtonian physics and Astronomy. Topics include Kinematics, Dynamics, Conservation Laws, Universal Forces, Waves, Planets, Stars, and Cosmology.

# Prerequisites:

# Eligibility for enrollment in College Algebra (MATH 1203)

**Introduction:**

 Physics is the science of the laws governing the mechanics of the universe. In this class we will cover the physics of the last 300+ years from Newton to modern astrophysics. Although this class focuses on physical concepts, this class will require algebraic manipulation of equations and evaluation of physics equations.

# Teaching Philosophy:

Education is a natural process which I am doing my best to emulate under the restrictions of a classroom setting. True learning is the responsibility of the student, and it is the responsibility of the professor to produce an environment which makes this process as easy as possible. During this class, we will partner together with the intent of both the student and the professor learning as much as possible about God and His amazing creation.

# Instructional Methods:

**Labs:** Experimental method is an important part of science, and thus will be an important part of this course. There will be three labs throughout the class which will take place in class and out of class. Some of these labs will not take place during the class period, and students must get together with their group to schedule opportunities for collaboration. These labs will be completed by groups of no more than three students.

## **Course Schedule:**

|  |  |  |  |
| --- | --- | --- | --- |
| Week | Topic | Chapters | Test |
| 1 | Philosophy of Science | Prologue | Week 6 |
| 2 | Kinematics: Describing Motion | 1 | Week 6 |
| 3 | Newton’s Laws | 2 | Week 6 |
| 4 | Energy & Momentum | 3 | Week 6 |
| 5 | Gravity | 4 | Week 6 |
| 6 | Lab Reports & Test |  |  |
| 7 | Fluid Mechanics | 5 | Week 12 |
| 8 | Electrodynamics | 8 | Week 12 |
| 10 | Magnetism | 9 | Week 12 |
| 11 | Waves | 10 & 11 | Week 12 |
| 12 | Lab Reports & Test |  |  |
| 13 | The Solar System | 26 | \*\* |
| 14 | Stars and Galaxies | 27 | \*\* |
| 15 | Cosmology | 28 | \*\* |
| 16 | Review for Final | n/a | \*\* |

Note: This schedule is subject to change as allowances for time are made.

\*\*This information will not have a test devoted to it, however it will be stressed on the final.

**Course Policies and Procedures:**

**Late Work:**  Late work will be accepted unless otherwise stated. This work will be penalized 10% of the total score for every day it is late.

**Grading:**

**Quizzes:** Quiz questions will be given via “clickers” at the beginning of class as well as throughout the lecture. The questions will cover the content being covered as well as any assigned reading. A clicker number will be assigned to each student and it is the student's responsibility to use the assigned clicker each class session. The lowest three participation scores of each student will be dropped, allowing for necessary absences. These grades cannot be made up for any reason.

**Online Homework:**  Homework will be assigned weekly through the website [www.masteringphysics.com](http://www.masteringphysics.com) and students will have one week to complete all homework assignments. The class ID for MasteringPhysics is: **MNUEVERYDAYPHYSICS**. All assignments will be due before class on the due date. Homework assignments are to reflect your personal work, though students are encouraged to collaborate to aid in their understanding.

**Lab Reports:** Reports of the findings of the take-home labs will come in two parts: written and presented. Details for written lab reports will be given to the students in class. Lab presentations will take place on the Tuesday before tests. These presentations should take approximately 5 minutes, explaining the method and findings of your experiment. This presentation can either take place orally in class or as a video (a good option for students who know they will be absent).

**Tests:** Tests will be given approximately every five weeks throughout the course. There will be two tests during the semester. Each test will be equally weighted at 10% of the total grade. These tests will include material from the four weeks immediately before them, however they may also contain material covered previously in the course. Tests may be curved at the discretion of the instructor.

**Final:** The final will be comprehensive, however it will stress the last portion of the class not covered in previous tests. The final may be curved to adjust the average at the discretion of the instructor.

**Final Grade Components:**

| **Percent / Point Value** | **Item** |
| --- | --- |
| 20% | Online Homework |
| 20% | Quizzes |
| 20% | Lab Reports |
| 30% | Tests |
| 20% | Final |

**Final Letter Grade Calculation:**

| **Grade** | **Score** |
| --- | --- |
| A | 93-100 |
| A- | 90-92 |
| B+ | 87-89 |
| B | 83-86 |
| B- | 80-82 |
| C+ | 77-79 |
| C | 73-76 |
| C- | 70-72 |
| D+ | 67-69 |
| D | 63-66 |
| D- | 60-62 |
| F | 0-59 |

## **Attendance:**

Students are expected to attend all class sessions except for serious illness or because of other unavoidable circumstances. Students are responsible directly to the instructor to see that course requirements are met.

Excessive absences may result in reduction of grade, reduction of credit, or both. Excessive absence is defined as 6 or more absences for a class that meets daily, 5 absences for a class meeting four times a week, 4 absences for MWF classes, 3 absences for a class meeting twice weekly, and two absences for a class meeting once a week. This rule applies to all absences, including those caused by unavoidable circumstances.

## **Communication:**

***Students should not use personal technology in the classroom***. Students are asked to silence all technology prior to entering the room.

Email Notifications: Only your official MNU student email address will be used for course notifications. It is your responsibility to check your MNU email and MNU’s Moodle Learning Management System on a regular basis.

## **Special Accommodation:**

MidAmerica Nazarene University complies with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973 regarding students with disabilities. MNU provides reasonable accommodations for students with properly documented disabilities to the extent that such accommodations do not interfere with the essential requirements of a particular course or program and do not create an undue hardship.  Written notification to the course instructor from the Kresge Academic Support Center is required so please plan accordingly.   Students who have questions about receiving accommodations are invited to contact the Kresge Center for a confidential discussion.  The Kresge Center may be contacted by visiting Mabee Library on the Olathe campus or via email at Kresge@mnu.edu. *Each eligible student is responsible for presenting relevant, verifiable, professional documentation and/or assessment reports to Kresge Center*. Guidelines for documentation may be found at https://www.mnu.edu/images/userUploads/Mabee\_Library/MNU\_ADA\_504\_Policy.pdf

## **Kresge Academic Support Center:**

## You are encouraged to use the university’s free online tutoring system, ***Smarthinking***, which can be accessed on the MNU portal at my.mnu.edu. ***Smarthinking*** is an organization that provides people, technology to offer outstanding online academic support to MNU’s students. Students at more than 1,000 institutions use ***Smarthinking*** for academic support and tutoring and help is available in over 45 content areas.

In addition, Kresge Academic Support Center, located on the first floor of Mabee Library, is a resource for MNU students needing academic support. Need help with a homework assignment? Have a big test coming up? Academic Support Center staff can help with tutoring in prerequisite and developmental skills, as well as studying, note taking, and test taking. Peer instructors are also available to provide tutoring in many subject areas. Peer tutoring sometimes occurs on weekday evenings. You just need to ask for help!

## **Academic Misconduct**:

The University’s academic integrity policy is located in the Student and Faculty Handbooks and must be read thoroughly and understood. The policy will be strictly enforced. The first offense results in failure of the assignment. A second offense in the same class results in failure of the course. Any three offenses during the student’s sequence of study results in dismissal from the university.

# Learning Outcomes:

* Identify and describe in general terms the ideas selected to promote a basic understanding of the physical world
* Define as well as have functional knowledge of physical concepts such as force, velocity, mass, acceleration, energy, electricity, magnetism, gravitation and waves.
* Define as well as have functional knowledge of astronomical concepts such as constellations, eclipses, stellar birth and evolution, galaxies, and cosmology.
* Distinguish between important scientific concepts such as laws, theories and models.
* Use scientific language to describe physical phenomena
* Use mathematics and problem solving techniques to solve simple mechanics and other scientific problems
* General Education Outcome: General Education Outcome: To acquaint students with the scientific method and how science is performed (GE6), to be assessed by the first two lab grades

|  |  |  |
| --- | --- | --- |
| **GNSC 2103** | **Chemistry in Everyday Life** |  |

|  |  |
| --- | --- |
| **Credit:** 3 hrs | **Instructor:** Jordan Mantha, PhD |
| **Lecture:** Smith 120 MWF 12:00 - 12:50pm | **Office:** Osborne 226  |
| **Contact**:jhmantha@mnu.edu | **Office Hours:** see door schedule |

## Require Materials

* *Conceptual Physical Science* 5th Ed. By Hewitt, Suchocki, and Hewitt (ISBN: 0321752937)
* *MasteringPhysics* Access Code (if not purchased with textbook)

## **Course description**

An introduction to the basic concepts of chemistry and how chemistry is utilized in nature and in the physical world around us. This course assumes no prior knowledge of chemistry and is designed primarily for persons in the liberal arts. Does not apply to a major in chemistry, biology, pre-medicine, or nursing.

**Prerequisite:** MATH 1103 or permission of instructor.

## Outcomes

Upon successful completion of this course the student will be expected to:

* demonstrate a basic understanding of the role of chemistry in society
* demonstrate a basic knowledge of the scientific method
* use mathematics and problem solving techniques to solve scientific problems

## Grading

Grades will be based on exams and other assignments. Final grades will be calculated based on the following weighting system and grading scale:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Assignments | 20% |  | 94.0 – 100% ..... A  | 90.0 – 93.9% .... A- |
| Writing Project | 15% | 87.0 – 89.9% .... B+ | 83.0 – 86.9% .... B | 80.0 – 82.9% .... B- |
| Participation |  5% | 77.0 – 79.9% .... C+ | 73.0 – 76.9% .... C | 70.0 – 72.9% .... C- |
| Exams (3) | 45% | 67.0 – 69.9% .... D+ | 63.0 – 66.9% .... D | 60.0 – 62.9% .... D- |
| Final Exam | 15% |  | 0 – 59.9% ......... F |  |

## Course Requirements

**Assignments:** Course assignments will consist of (but not necessarily be limited to) homework, reading quizzes, and in-class activities that will involve working application problems or guided inquiry worksheets.

**Writing Project:** a paper on one of the following topics must be submitted electronically on Moodle by the beginning of class on February 27th:

* the ethical/moral role of chemistry in society
* strengths and weakness of the scientific method (using examples from chemistry)
* the future of chemistry in society (will it help or hinder? why?)

**Exams:** There will be three regular exams covering specific chapters from the textbook. Raw exam scores may be scaled at the discretion of the instructor but will not be curved based on the scores of other students. Everyone can get an A, everyone can get an F. It is in your best interest to help each other. There will be a comprehensive **final exam**.

## Course Policies

**Attendance:** Attendance in lecture is necessary for success in this class. In accordance with university policy, excessive absences (for any reason) beyond 3 missed lectures may be penalized by a decrease in your final grade and if you miss 10 or more days, you will fail the course regardless of performance.

**Cell Phones and Laptops:** The classroom is a place for learning and focus is important. The use of cell phones and laptops for non-class activities is completely prohibited. Texting or other distracting pastimes during class will result in you being considered absent (see above) for that class period.

**Classroom Behavior:** Please refrain from reading, sleeping, conducting private conversations, or eating during class. These actions are disruptive to the rest of the class. Remember, we are here to learn. These activities not only distract from your own learning, but also contribute to the distraction of others. I reserve the right to ask any student being a distraction or disruption to leave.

Academic Integrity:MidAmerica Nazarene University takes academic integrity very seriously, and your instructor is no different. Any student discovered cheating on any aspect of the course may be given an immediate failing course grade. A letter will be sent to the Dean of the student’s school or college explaining that the grade was given as a result of academic misconduct. Academic misconduct includes submitting work not completed by the student, work that is a copy of another students work, or work that has been obtained through means forbidden by the assignment or test. If there are any questions regarding this policy, please speak with me about them. Refer to the Student Handbook for a complete definition of academic dishonesty and MNU’s policy concerning it.

**Mabee Library and Learning Commons:** All students have access to a vast array of information resources and services through the Mabee Library, as well as collaborative study spaces and group/individual study rooms, a computer lab, and a coffee shop, “Dewey’s Book & Bean.” Library hours, helpful research guides, the library catalog, and other resources are found on the library website (<http://library.mnu.edu>). The library provides access to a large collection of print books, audiobooks, and music CDs. Additionally, the library provides 24/7 online access to a large collection of e-books and online reference databases. These online resources may be accessed from the campus portal and the library website, using your MNU login. Journal articles and books not found in the Mabee Library collections or online resources may be requested on interlibrary loan. For assistance, contact the library by phone (913-971-3485) or by online chat (on the library website). Library faculty and staff provide assistance in the use of the library’s collections and e-resources, as well as APA, MLA, and Chicago/Turabian style formatting, and the development and composition of research papers.

**Kresge Academic Support Center:** All students have access to a variety of academic success services from the Kresge Center, located in the Mabee Library building. Kresge staff provide help with tutoring in prerequisite and developmental skills, as well as studying, note taking, and test taking. Peer instructors are also available to provide tutoring in many subject areas. Peer tutoring is available. Tutoring resources are also available online, 24/7, through an online service called “Smarthinking.” The Kresge Center is also responsible for Institutional Testing services, and accommodations assistance for students with special needs. You may contact the center by phone (913-971-3387) or by visiting their website (<http://library.mnu.edu/learning-commons/academic-support-center.html>).

**Online Tutoring (Smarthinking):** Online tutoring services are available at no cost for all students in subjects such as math, science, business, and writing through a service called “Smarthinking.”  Papers may be submitted for writing assistance (grammar, format, and citation style).  Smarthinking tutors will not review entire draft papers to provide proofreading and editorial services, but can respond to specific formatting and grammar questions. You may access this service through the campus portal.

## Lecture Schedule

The schedule will almost certainly change, but I will announce changes in class and on Moodle.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Date | Topic | Reading |
| Week 1 | 1/14 | Air Quality | 1.1 – 1.4 |
| 1/16 | Atoms, Molecules & Reactions | 1.6 – 1.9 |
| Week 2 | 1/21 | Chemistry and Air Quality | 1.10 – 1.14 |
| 1/23 | The Periodic TableLewis Structures | 2.1 – 2.3 |
| Week 3 | 1/28 | Light and its Effects | 2.4 – 2.7 |
| 1/30 | Ozone Destruction | 2.8 – 2.12 |
| Week 4 | 2/4 | **Exam 1** ( Chapter 1& 2) |  |
| 2/6 | Intro to Global WarmingMolecular Shape | 3.1 – 3.4 |
| Week 5 | 2/11 | Carbon CycleMass and Moles | 3.5 – 3.8 |
| 2/13 | Consequences and Challenges of Climate Change | 3.9 – 3.11 |
| Week 6 | 2/18 | Fossil FuelsGeneration of Electricity | 4.1 – 4.4 |
| 2/20 | How do we measure chemical energy? | 4.5 – 4.6 |
| Week 7 | 2/25 | New Fuels | 4.7 – 4.11 |
| 2/27 | **Exam 2** (Chapter 3 & 4) **Papers** due |  |
| Week 8 | 3/4 | Properties of WaterAqueous Solutions | 5.1 – 5.6 |
| 3/6 | Ionic Solutions | 5.7 – 5.9 |
| Week 9 | 3/11 | Water Issues | 5.10 – 5.12 |
| 3/13 | Catch Up Day |  |
| Week 10 | 3/17 | Spring Break – No Class |  |
| Week 11 | 3/25 | Acids and BasespH | 6.1 – 6.4 |
| Week 12 | 4/1 | Environmental Issues of pH | 6.5 – 6.10 |
| 4/3 | Acid Rain | 6.11 – 6.13 |
| Week 13 | 4/8 | **Exam 3** (Chapter 5 & 6) |  |
| 4/10 | Organic Compounds and Functional Groups | 10.1 – 10.3 |
| Week 14 | 4/15 | How Drugs Work | 10.4 – 10.7 |
| 4/17 | Drug Use and Abuse | 10.8 – 10.10 |
| Week 15 | 4/22 | DNA | 12.1 – 12.4 |
| 4/24 | ProteinsGenetic Engineering | 12.5 – 12.8 |
| Week 16 | 4/29 | Review for Final |  |
| 5/1 | Final Exam 10:00 – 11:50am |  |