Summary – Common Inquiries – Exploring the Physical Sciences

**Exploring the Physical Sciences** (i.e., Physics, Chemistry) Courses satisfying this requirement introduce students to basic properties and principles of matter, examining structure and function in elementary physical systems traditionally studied by physicists and chemists. Students should come to appreciate both creative and systematic aspects of scientific method, and should come to understand the power of theory and prediction within the framework of empirical/experimental modes of inquiry.

**Interpretive Statement**

a) The physical science general education requirement can be satisfied by taking one semester of General Physics (PH21 or PH23), or Physics for the Life-Sciences (PH11 or PH13), or General Chemistry (CHM5 or CHM6) – with or without the labs that normally accompany these courses. (Note that most students will automatically sign up for the labs together with the lecture courses.)

These introductory courses are usually taken by prospective science majors. By allowing these courses to be part of the GE offering we avoid situations where science majors who have already mastered quite difficult material are forced to go back and study the same topics again at a less sophisticated level.

It is important nevertheless that these introductory courses contain significant contributions to each student’s liberal arts education. This means that, for instance, a discussion of the so-called “scientific method” must be included. Also, students could be assigned reading that connects their subject matter to theological or philosophical questions. Finally, it would be very appropriate to ask students to reflect in an essay on the relationship between their faith and their field of study.

b) The currently existing science facilities and the size of the current science faculty prevent us from offering substantial laboratory activities as an integral part of our general education science classes. The addition of (integrated or parallel) science labs to our physics and chemistry general education courses would be highly desirable. Such labs would add increased interaction between students and faculty, and also foster collaborative learning among students.

The desire for improving Westmont’s science laboratories is shared by the physics, chemistry, and biology faculty, as well as our provost Shirley Mullen. Since interactive & collaborative learning between faculty and students is highly valued and expected by WASC, the current deficiencies in this area are not acceptable and need to be revisited.

c) It is difficult to deal with the issue of interdisciplinary courses in a general way. There appears to exist a general consensus among the faculty in physics and chemistry that it would be best to look individually at such course proposals.

It may be more appropriate for certain interdisciplinary courses (dealing, for instance, with philosophical and theological issues in physics and astronomy) to be offered under the “common context” umbrella, and perhaps to be co-taught with another faculty member from those areas.

d) In order for our science majors (physics and chemistry) to be able, in the future, to double major (e.g. in chemistry and philosophy, or physics and math), it may be necessary that more general education credit be given for AP classes, or for classes taken over the summer at other institutions.
Fall 2004

8. CHM005H  Since chemistry is part of my course of study anyway it really did not affect me in terms of viewing the class as the fulfillment of GE requirements. I know that the syllabus stated what GE requirements the class fulfilled, but beyond that there was not much discussion of the program.

9. CHM 005  Once again, I found that my Chemistry class ultimately met the goals of the GE, but did not give me a better understanding of those goals. The goals of the GE were never discussed in the class. I did, however, learn about many of the basic properties and principles of matter, the scientific method, and used experimental modes of inquiry. Through lecture I gained a strong understanding of introductory Chemistry. My weekly labs were also extremely helpful to me as they brought the things I was learning in lecture to life, and showed me how to put what I was learning to practical use.

5. PS011  In Introduction to Physical Science, I learned about basic properties and principles of matter and how they related to physics, chemistry, and earth science. Learning about the scientific method as a way to acquire knowledge and evaluate information is something that I can use in many different areas of life. The instructor took time to examine how science relates to society, culture, history, and the Christian faith.

Spring 2005

16. CHM 005  Once again, I found that my Chemistry class ultimately met the goals of the GE, but did not give me a better understanding of those goals. The goals of the GE were never discussed in the class. I did, however, learn about many of the basic properties and principles of matter, the scientific method, and used experimental modes of inquiry. Through lecture I gained a strong understanding of introductory Chemistry. My weekly labs were also extremely helpful to me as they brought the things I was learning in lecture to life, and showed me how to put what I was learning to practical use.
Physics of Music was both an interesting and intriguing course, and I found this class to also be a significant part of my understanding of the goals of Westmont’s General Education. Not only did this class fulfill the requirement of Exploring the Physical Sciences, but it also fulfilled the requirement of Reasoning Abstractly, and I believe it was successful in facilitating both. The class allowed me to look at something as conceptual and subjective as music perception and then to study it objectively through the science of physics. This class fused both appreciation of music with comprehension of the physical qualities of sound and instruments. Such fusion is important to a GE requirement because it allows students to unify subjective and objective elements; to be able to work out the mathematical equations and then conversely explain those concepts literally. What I learned through this class will better prepare for future avenues of thinking where such reasoning is involved.

Fall 2005

3. PHY-021
Physics has also helped with my understanding of the GE program. I have learned a great deal about the physics of the world around us and this has been related to Christianity through a variety of faith in learning short lectures.

4. PS 11
Physical Science
My Intro to Physical Science class has given me a broad review of all the Physical Sciences. The goals of GE are to explore the Physical Sciences and this class touches on all of them. I definitely grew a deeper appreciation for the sciences and a new understanding of them as well. I understand that General Education classes are to reach on many different areas, and this class not only reached various areas, but also specifically various areas in science. We learned basics of Chemistry, Physics, Earth Science, and Astronomy. It really gave me a deeper appreciation for the world and
sciences that God created. It was a unique Science class that fit God into the creation and foundation of it all. Most science courses do not find room for God. This class also fulfilled a quantitative component through the form of problem solving, calculations, and analysis of physical situations. I think this class has made me see our modern world as not more comfortable, but as more meaningful. This was the goal of the GE’s and by exploring this course, I would say it was done.

Spring 2006

CHM 004
a. The goals of the GE are also made clear in the introduction and syllabus for the class.
b. This course also effectively accomplished the goals it sets out to. We take chemistry and apply it to daily life and current issues. Every week we are assigned a reading about current controversies in science or the environment, both nation-wide and globally, and we take the time to discuss them in class, both from a Christian perspective and a scientific perspective.

PHY-023
Physics is effective in communicating the goals of the GE as it gives a breadth of knowledge that aids in the understanding of other similar classes such as Differential Equations and General Chemistry II, which I am in. Physics is quite effective in accomplishing the goals of the GE area as it gives a thorough overview of electricity, magnetism, and optics. It also integrates faith and learning as often as is possible. For example, a discussion of old earth versus young earth when we learned about the magnetic poles and how they’ve switched nine times in the last four and a half billion years.

Fall 2006

PHS-011
The course was fairly effective in communicating the goals for exploring the physical sciences. The course is geared specifically for the students who are not science majors, but need to take a class in the sciences. It gave me a basic understanding of all areas of the physical sciences.

PHS 007
This course was a great example of a well-explained GE class. The goals of the course and their alignment with the goals of the general education program were spoken about explicitly in the syllabus, and Dr. Sommerman did a great job of following up on these goals. I especially appreciated his integration of the faith element into the astronomy course without somehow making light of the deep science involved in the subject as well. The class gave me a great feel and understanding of what the physical sciences are all about, even though this specific course probably only touched the tip of the iceberg.

PHS 007
This was a really great class. Dr. Sommermann is very humorous and engaging in the classroom, and is also very approachable for extra help. Our frequent tests, labs, and exploration of the night sky, allowed for plenty of opportunities to engage with the natural world. I particularly enjoyed the night sky labs we did as a class, with Dr. Sommermann's guidance. To me, that was the most effective and interesting way that we "Explored the Physical Sciences".

Spring 2007

CHM 004
A) In Chemistry, Culture, and Society we are able to learn about chemistry and how the ideas that are used in the lab apply to the society in which we live. It has been incredibly helpful to learn about chemistry in this respect because it begins to become more important and makes the material easier to learn.
B) This course has been very effective in communicating the goals of the G.E through lab demonstrations and class assignments.