

PHY-101: Physical Science of Everyday Phenomena

Written By: John F. Birch

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Course Description

This course provides an introduction to the physical sciences for non-science majors in a lecture-activity format. Emphasis is placed upon understanding the major principles and concepts of the physical sciences, including fundamental concepts from physics, chemistry, and astronomy. Basic mathematical skills in algebra are utilized.

Credit Hours: 3

Prerequisite Courses: None

Prerequisite Skills and Knowledge: None

Course Overview

This course is intended to motivate you to appreciate the approach of physical science and begin a quest to examine the complexities of the universe. Accordingly it will focus on various topics of physical science: scientific methodology, mathematics in science, Newton’s Laws/motion, energy, electricity and magnetism, atoms and the periodic table, compounds/mixtures, chemical reactions, nuclear reactions, and the universe

The purpose of this course is to familiarize you with the topics that make up the general body of science known as physical science. This course is also based on the philosophy that students learn best through active engagement. Therefore you will need to solve basic scientific calculations, participate in discussions, actively complete simple exercises, and engage in other course learning activities in order to broaden your knowledge of the physical sciences.

Course Outcomes

Upon completion of this course, you should be able to:

1. Define the “scientific method”. (GE#1)
2. Explain the concept of energy and identify various forms (at least six). (GE#2)
3. Describe the relationship between force and motion. (GE#3, #4)
4. Perform simple scientific calculations using algebra. (GE#3)
5. Explain the difference between atomic and nuclear processes using the Bohr model of the atom. (GE# 4, #5)
6. Discuss the relationship between atomic bonds and chemical reactions. (GE#4)
7. Identify the stages of stellar life. (GE#4, #5)

General Education (GE) Outcomes for Scientific Ways of Knowing

1. Explain how scientific explanations are formulated, tested, and modified or validated.
2. Distinguish between scientific and non-scientific evidence and explanations.
3. Apply basic observational, quantitative, or technological methods to gather data and generate evidence-based conclusions.
4. Use current models and theories to describe, explain, or predict natural phenomena.
5. Locate reliable sources of scientific evidence to construct arguments related to real-world issues.
6. Describe elements of Christian faith in the foundations of modern science.

Course Textbook

Tillery, Bill W. (2017). *Physical Science* (11th ed). New York, N.Y: McGraw Hill. (This e-text is embedded in the McGraw-Hill Connect resource, which is accessible through the table of contents.)

Course Technology

McGraw-Hill Connect

IWU Diversity Statement

IWU, in covenant with God’s reconciling work and in accordance with the Biblical principles of our historic Wesleyan tradition, commits to build a community that reflects Kingdom diversity. We will foster an intentional environment for living, teaching and learning, which exhibits honor, respect, and dignity. Acknowledging visible or invisible differences, our community authentically values each member’s earthly and eternal worth. We refute ignorance and isolation and embrace deliberate and courageous engagement that exhibits Christ’s commandment to love all humankind.

Grading Scale

Grade	Quality Points Per Credit	Percentage	Score

A	4.0	95%–100%	950–1000
A-	3.7	92%–94.9%	920–949
B+	3.3	89%–91.9%	890–919
B	3.0	85%–88.9%	850–889
B-	2.7	82%–84.9%	820–849
C+	2.3	79%–81.9%	790–819
C	2.0	75%–78.9%	750–789
C-	1.7	72%–74.9%	720–749
D+	1.3	69%–71.9%	690–719
D	1.0	65%–68.9%	650–689
F	0.0	0%–64.9%	0–649

Grading Policies

Your grading policy for your course is dependent on your school and program. Your grading policies can be found in the IWU Catalog.

Letter Grade Equivalencies

Grade	Description of Work
A	Clearly stands out as excellent performance. Has unusually sharp insights into material and initiates thoughtful questions. Sees many sides of an issue. Articulates well and writes logically and clearly. Integrates ideas previously learned from this and other disciplines. Anticipates next steps in progression of ideas. Example "A" work should be of such nature that it could be put on reserve for all cohort members to review and emulate. The "A" cohort member is, in fact, an example for others to follow.
B	Demonstrates a solid comprehension of the subject matter and always accomplishes all course requirements. Serves as an active participant and listener. Communicates orally and in writing at an acceptable level for the degree program. Work shows intuition and creativity. Example "B" work indicates good quality of performance and is given in recognition for solid work; a "B" should be considered a good grade and awarded to those who submit assignments of quality less than the exemplary work described above.
C	Quality and quantity of work in and out of class is average. Has marginal comprehension, communication skills, or initiative. Requirements of the assignments are addressed at least minimally.

D	Quality and quantity of work is below average. Has minimal comprehension, communication skills, or initiative. Requirements of the assignments are addressed at below acceptable levels.
F	Quality and quantity of work is unacceptable and does not qualify the student to progress to a more advanced level of work.

Course Workshop Summary

Workshop	Devotion*	Discussion*	Connect Assignment*	Total Points per Workshop
Workshop One	1/0	1/20	5/180	200
Workshop Two	1/0	1/20	5/180	200
Workshop Three	1/0	1/20	5/180	200
Workshop Four	1/0	1/20	5/180	200
Workshop Five	1/0	1/20	5/180	200
End of Course Survey				10 extra credit
TOTAL	5/0	5/100	25/900	1000

* Number of Activities/Sum Point Totals

Workshop One Outline

Title	Due Dates	Time	Points
1.1 Exercise: Devotional - God and the Universe	Due by the end of the workshop.	.5 hours	0
1.2 Discussion: Science and Faith	Initial post due by the end of the 4th day of the workshop; two responses due by the end of the workshop.	.5 hours	20
1.3 Assignment: The Nature of Science	Due by the end of the workshop.	4 hours	40
1.4 Assignment: Force and Motion	Due by the end of the workshop.	4 hours	40
1.5 Assignment: Gravity	Due by the end of the workshop.	4 hours	40
1.6 Assignment: Energy	Due by the end of the workshop.	4 hours	40
1.7 Assignment: Energy Units & Sources	Due by the end of the workshop.	1.5 hours	20
Totals		18.5 hours*	200

*These times are only estimates. Actual assignment completion times will vary.

Workshop Two Outline

Title	Due Dates	Time	Points
2.1 Exercise: Devotional - Creation	Due by the end of the workshop.	.5 hours	0
2.2 Discussion: Heat Transfer	Initial post due by the end of the fourth day of the workshop.	.5 hours	20
Totals		18.5 hours*	200

Title	Due Dates	Time	Points
2.3 Assignment: Kinetic Theory of Gases	Due by the end of the workshop.	4 hours	40
2.4 Assignment: Heat	Due by the end of the workshop.	4 hours	40
2.5 Assignment: Passive Solar Heating	Due by the end of the workshop.	4 hours	40
2.6 Assignment: Wave Motion	Due by the end of the workshop.	4 hours	40
2.7 Assignment: Sound	Due by the end of the workshop.	1.5 hours	20
Totals		18.5 hours*	200

*These times are only estimates. Actual assignment completion times will vary.

Workshop Three Outline

Title	Due Dates	Time	Points
3.1 Exercise: Devotional - Framing of the Worlds	Due by the end of the workshop.	.5 hours	0
3.2 Discussion: Lightning: Midair Strike	Initial post due by the end of the fourth day of the workshop.	.5 hours	20
3.3 Assignment: Electricity	Due by the end of the workshop.	4 hours	40
3.4 Assignment: Magnetism	Due by the end of the workshop.	4 hours	40
3.5 Assignment: Electric Power Generation and Transmission	Due by the end of the workshop.	4 hours	40
3.6 Assignment: Light	Due by the end of the workshop.	4 hours	40
3.7 Assignment: Atoms and Periodic Properties	Due by the end of the workshop.	1.5 hours	20
Totals		18.5 hours*	200

*These times are only estimates. Actual assignment completion times will vary.

Workshop Four Outline

Title	Due Dates	Time	Points
4.1 Exercise: Devotional - Faith and the Scientific Method	Due by the end of the workshop.	.5 hours	0
4.2 Discussion: Chemical Bonding	Initial post due by the end of the fourth day of the workshop; two responses due by the end of the workshop.	1 hours	20
4.3 Assignment: Chemical Reactions	Due by the end of the workshop.	4 hours	40
4.4 Assignment: Water and Solutions	Due by the end of the workshop.	4 hours	60
4.5 Assignment: Acid Rain	Due by the end of the workshop.	4 hours	40
4.6 Assignment: Nuclear Principles	Due by the end of the workshop.	4 hours	40
Totals		17.5 hours*	200

*These times are only estimates. Actual assignment completion times will vary.

Workshop Five Outline

Title	Due Dates	Time	Points
5.1 Exercise: Devotional - God and the World	Due by the end of the workshop.	.5 hours	0
5.2 Discussion: Risk and Perception	Initial post due by the end of the fourth day of the workshop; two responses due by the end of the workshop.	.5 hours	20
5.3 Assignment: Radioactivity	Due by the end of the workshop.	4 hours	40
5.4 Assignment: Nuclear Power for Generating Electricity	Due by the end of the workshop.	4 hours	40
5.5 Assignment: Stars	Due by the end of the workshop.	4 hours	40
5.6 Assignment: Galaxies	Due by the end of the workshop.	4 hours	40
5.7 Assignment: The Solar System	Due by the end of the workshop.	1.5 hours	20
End of Course Survey	Due by the end of the workshop.	.5 hours	10 extra credit
Totals		18.5 hours*	200

*These times are only estimates. Actual assignment completion times will vary.

Course Assignments

TOTALS	91.5 hours*	1000
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* These timings are based on estimations of average times to complete each assignment. Actual assignment completion times will vary.

Expectations, Policies, and Important Student Information

School/Division	Link
DeVoe School of Business	
Division of Liberal Arts	View School/Division Expectations, Policies, and Student Information
School of Services and Leadership	
School of Educational Leadership	View School/Division Expectations, Policies, and Student Information
Wesley Seminary @ IWU	View School/Division Expectations, Policies, and Student Information
Nursing - Undergraduate	View School/Division Expectations, Policies, and Student Information
Nursing - Graduate	View School/Division Expectations, Policies, and Student Information