



## **PHS-1060 Physical Science**

**Online**

**3 credit hours**

**Fall 2020**

### **Instructor Information**

Kevin W. Stewart Ph.D.

*Associate Professor*

*Department of Chemistry and Biochemistry*

### **Instructor Contact Information**

**Email:** [kstewart@harding.edu](mailto:kstewart@harding.edu) (My preferred method of contact)

**Office:** SCI 135

**Phone:** (501) 279-5617

### **Course Communication**

I am available for office hours via Google Hangout. Please send an email requesting a meeting and I will be happy to set up a time to meet with you.

### **Online Course**

This course is strictly taught online. All assignments and course interactions will be done using internet technologies. All course elements will use the Central Time Zone (Searcy time) for deadlines.

### **University Mission Statement**

Harding's mission is to provide a quality education that will lead to an understanding and philosophy of life consistent with Christian ideals.

### **Department Mission Statement**

The Department of Chemistry and Biochemistry supports the mission of Harding University. We are committed to:

**Model** Christian professionalism in the way we teach and interact with students both in and out of the classroom.

**Outfit** our students with the necessary knowledge and skills through rigorous, challenging, and insightful instruction that they will need for successful careers in chemistry, education, health professions or allied disciplines.

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**Lead** our students in developing their critical thinking skills and their oral and written communication skills. We will cultivate in our students the capacities and dispositions for reflective and critical thought, independent lifelong learning, ethical practices in science, and creativity and innovation to create scientific knowledge all within the Christian worldview.

**Engage** our students in scientific inquiry.

### Catalog Description

An introduction to basic concepts in physics and chemistry including motion, gravity, momentum, energy, sound, electricity and the atom. Credit is not granted in PHS 1060 following credit for any other physics or chemistry course.

### Prerequisites

*NONE*

### Course Rationale

Science matters at a liberal-arts university because scientists alone will not solve the problems facing our global community. At Harding, we strive to ensure that each student receives a liberal-arts education that provides them with the skills to critically evaluate information content, its sources, and its relevance. In our environmentally and economically challenged, technological world, it is crucial that each student has the ability to understand and critically evaluate scientific evidence and arguments. This course introduces students to the scientific method, the foundations of chemistry and physics, and the critical thinking skills required for success in the modern world.

### Required Course Materials

For this course, you need 3 key items:

1. Paul G. Hewitt, John Suchocki, and Leslie A. Hewitt. Conceptual Physical Science. Pearson/Addison Wesley, 2008. ISBN-13: 978-0134060491 **NOTE: You may use the 4<sup>th</sup>, 5<sup>th</sup>, or 6<sup>th</sup> edition of the book, however page numbers used in the course will be valid for the 6<sup>th</sup> edition only.**
2. Either Natalie Angier. The Canon: A Whirligig Tour of the Beautiful Basics of Science. Houghton Mifflin Harcourt (2007). ISBN-13: 978-0618242955

**OR**

- Kean, Sam. The Disappearing Spoon: And Other True Tales of Madness, Love, and the History of the World from the Periodic Table of the Elements. Little, Brown and Company (2010). ISBN-13: 978-0316051644
3. Scientific calculator. Calculator must be able to handle scientific figures, log functions, and square roots. Several apps are available that fulfill this requirement.

The Harding Bookstore carries this textbook and the following links to Harding Bookstore are provided for your convenience:

1. Bookstore link: <http://hubookstore.harding.edu/home.aspx>

2. Bookstore "How to order Textbooks": <http://hubookstore.harding.edu/SiteText.aspx?id=32615>.

You may also purchase your textbook from [Amazon](#).

### **Textbook Rationale**

**Conceptual Physical Science, Sixth Edition**, provides a conceptual overview of basic, essential topics in physics, chemistry, earth science, and astronomy with optional quantitative analyses. The authors focus on concepts before computations. With its clear, friendly writing style, and strong integration of the sciences, this book connects well with all students.

(Description taken from [https://www.amazon.com/Conceptual-Physical-Science-Paul-Hewitt/dp/0134060490/ref=sr\\_1\\_1?s=books&ie=UTF8&qid=1515532131&sr=1-1&keywords=conceptual+physical+science+6th+edition](https://www.amazon.com/Conceptual-Physical-Science-Paul-Hewitt/dp/0134060490/ref=sr_1_1?s=books&ie=UTF8&qid=1515532131&sr=1-1&keywords=conceptual+physical+science+6th+edition))

### **Optional Materials**

There are no optional materials for this course.

### **University Learning Outcomes**

#### **Biblical Knowledge and Application**

ULO 1: Students will demonstrate understanding of biblical content and interpretation, and its applications in modern life.

#### **Life's Mission**

ULO 2: Students will articulate the connection between Christian values and principles and their life's mission.

#### **Written Communication**

ULO 3: Students will demonstrate effective written communication with appropriate consideration for the context and audience.

#### **Analytical Reasoning**

ULO 5: Students will employ contextually appropriate methods to gather and evaluate available information and make a reasoned argument based on that information.

### **Course Objectives**

Upon completion of this course, students will be able to:

1. identify and explain the relationship between faith and science, both historically and in the current culture.
2. examine the creative and systematic aspects of the scientific method and the impact of the data collected.
3. record measurements and perform simple calculations.
4. discuss relationships between the basic principles of physics and simple systems.

5. describe the fundamental aspects of chemistry with regard to the basic properties and principles of matter.
6. formulate an opinion on science related issues that affect our society by summarizing articles using correct science terminology and concepts.

### Integration of Faith and Learning Statement

This course will be taught from a Christian perspective. Science and Christianity are often seen to be at odds with one another, however this course will show that they inform one another. The role of science is to explore and explain what God has done.

### Grading Information

You will be given feedback during the duration of this course. Feedback may be in the form of comments on assignments, responses to discussion posts and comments, or rubrics. The intent of this feedback is to inform you of how well you met the expectations for these components.

**Course grading:** Assessment of the knowledge, skills, and proficiency of each student for the purpose of assigning a letter grade at the completion of this course will be based on 953 points (see below). Final average will be computed as points earned / possible points.

|                                |                    |                       |
|--------------------------------|--------------------|-----------------------|
| Reflections and Discussions    | 4 @ 32 pts each    | 128                   |
| Checking your Progress Quizzes | 13 @ 25            | 325                   |
| Explorations                   | 3 @ 15.66 pts each | 47                    |
| Exams                          | 4 @ 100 pts each   | 400                   |
| Critical Book Review           | 1 @ 100 pts        | 100                   |
| Total Points                   |                    | <b>1000 pts Total</b> |

|                 |                |               |
|-----------------|----------------|---------------|
| Grade schedule: | A 90-100%      | 900-1000      |
|                 | B 80-89        | 800-899       |
|                 | C 70-79        | 700-799       |
|                 | D 60-69        | 600-699       |
|                 | F less than 60 | 599 and below |

This class will not be graded on a curve.

The course is designed to be completed at your own pace, with a few deadlines to make sure that you are making progress. There will be one discussion topic posted for each week. Your thoughts on the discussion question are due by midnight Wednesday. The responses to two other student's thoughts are due by midnight on Friday (except the last week, which is due Thursday at noon). **No late assignments will be**

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**accepted.** The discussion thoughts are already posted, so you can work ahead if you are going on vacation for a week, etc. You are encouraged to maintain a steady pace throughout the course. If you are not making adequate progress, you will be notified by the instructor. If progress is still not sufficient, then the instructor reserves the right to remove you from the course.

### **Reflections and Discussions:**

At the end of each course element, there is a reflection posted to help you tie the information we are learning about in the course with current topics of interest. Each student is required to post a response to the prompt by midnight on Wednesday of each week. Each response should thoroughly address the given topic, with supporting information properly cited. Each response should be 250 words minimum. Additionally, each student is required to submit a 50+ word response on two other student's responses. Each student is encouraged to respond to comments that have been made on their response as well. Each Response is worth 20 points, and the discussion on other student's posts are worth 6 points each.

### **Checking Your Progress Quizzes:**

At the end of each lesson, a homework assignment is provided to help you cement the concepts taught in that lesson. Each homework assignment can be repeated multiple times to help you improve your grade. The grade for each assignment will be an average of all attempts. Each Checking Your Progress is worth 25 points.

### **Explorations:**

Explorations are simple chemistry and physics activities that can be done with things most of you will already have around the house or apartment. The explorations give you a chance to put into practice the concepts that you are learning in each Element. Each Exploration is worth 15.67 points.

### **Exams:**

There are four exams in this course, one at the end of each Element. The exams are in Canvas and have a time limit associated with them. Please make sure to check the time associated with the exam and set aside ample time to complete the exam. The exams are to be taken without assistance of any kind. It is permissible to use a calculator and scratch paper. Only one attempt is allowed per exam. Each exam is worth 100 points.

### **Critical Book Review:**

A critical book review of *The Canon* OR *The Disappearing Spoon* is to be submitted via Canvas. A critical book review is not a summary of the book. A critical book review states the thesis of the book and analyzes whether or not the book achieved its stated goal(s). In a critical book review you are to highlight both the strong and weak points of the book, as well as give outside references as needed to support your statements. A complete description of assignment is given on Canvas.

### **Extra Credit:**

There are no extra credit opportunities offered in this course.

## **Netiquette**

Responses to discussions and fellow classmate's posts will take place inside of Canvas. As ambassadors of Christ, we should always address each other in a manner that reflects Christ.

"Let your conversation be always full of grace, seasoned with salt, so that you may know how to answer everyone." – Col. 4:6 (NIV)

## **Participation/Attendance**

The very nature and depth of undergraduate studies mandate students participate in all course activities. Each student's participation is essential for the success of the entire class as well as the success of the student. True exchange of undergraduate level academic ideas and thoughts can only be achieved with everyone actively participating.

You are expected to actively participate in all required instructional activities in this course. Online courses are no different in this regard; however, participation must be defined in a different manner.

1. Each student is required to actively participate a minimum of 2 days a week unless an extended absence from the course has been approved by the instructor.
2. Lack of participation for a period of up to 7 days will be documented.
3. Any student non-participatory during 3 or more weeks of a 8 week term, may receive an F for that course.
4. Students aware of necessary absences must inform your teacher with as much advance notice as possible in order to make appropriate arrangements.

Attendance Policy: [Harding University Attendance Policy](#)

## **Submitting Assignments**

The default submission method for assignments should be in Canvas. Each assignment will have a designated place in Canvas. If an assignment submission method or other change occurs, an announcement or email will be sent to the students.

When sending emails related to an assignment, do the following:

- Use a subject line that describes the content (consider this format) Course Name / Assignment / Topic. For example, if you have a question about the critical book review, use a subject line of "PHS-1060 / Critical Book Review / Description of problem".
- Add URGENT to the subject line, only when necessary.
- Please provide enough detail so the response can be thorough.
- Remember while the writing in an email is not being graded, it should still be professional and courteous.
- Assignments are graded as quickly as possible. Once a grade has been given for an assignment, please submit all requests for a regrading or clarification of a grade within 72 hours. The instructor reserves the right to refuse all requests after this time period.

## **Rubrics**

There are grading rubrics associated with your assessments in this course. It is good practice to review rubrics before you submit your assignments. It will help you formulate your responses and earn full points. In Canvas, rubrics are located in two places: 1) Discussions – from the discussion forum, select the gear wheel in the top right, select “Show Rubric” from the drop-down menu. 2) Assignments (non-discussions) – the rubric is displayed at the bottom of the assignment description.

## **Additional Course Requirements**

### **Technology Requirements**

For a list of canvas supported browsers, visit <https://guides.instructure.com/m/4214/l/41056-which-browsers-does-canvas-support>

This course requires that you have access to a computer that has internet capabilities. You are responsible for having a reliable computer and internet connection throughout the course. You will need to have access to, and be able to use, the following software packages:

1. Word processing software capable of producing document as a .pdf.

### **Technical Support**

For technical assistance from 8:00 a.m. - 5:00 p.m., M-F, please contact the e-Learning Help Desk at  
Phone: 501-279-5201

Email: [elearning@harding.edu](mailto:elearning@harding.edu)

Web: <http://www.harding.edu/elm>

For Canvas assistance, search Canvas Guides at: <https://guides.instructure.com/m/8470>.

### **Learning Management System**

Canvas is the Learning Management System (LMS) used in this course. Canvas sends an email confirmation to your Harding University email once an assignment is graded or an announcement is posted. Canvas can be accessed here: <https://harding.instructure.com/login>. Click here for: [Canvas Accessibility](#) and [Privacy](#) Policies.

# University Policies

## Drop and Add Dates

These change every semester and can be found at [www.harding.edu/registrar](http://www.harding.edu/registrar).

## University Assessment

Harding University, since its charter in 1924, has been strongly committed to providing the best resources and environment for the teaching-learning process. The board, administration, faculty, and staff are wholeheartedly committed to full compliance with all criteria of the Higher Learning Commission of the North Central Association of Colleges and Schools. The university values continuous, rigorous assessment at every level for its potential to improve student learning and achievement and for its centrality in fulfilling the stated mission of Harding. Thus, a comprehensive assessment program has been developed that includes both the Academic units and the Administrative and Educational Support (AES) units. Specifically, all academic units will be assessed in reference to the following Expanded Statement of Institutional Purpose: **The University provides programs that enable students to acquire essential knowledge, skills, and dispositions in their academic disciplines for successful careers, advanced studies, and servant leadership.**

## Students with Disabilities Accommodations

It is the policy for Harding University to accommodate students with disabilities, pursuant to federal and state law. Therefore, any student with a documented disability (e.g. physical, learning, or psychological) who needs to arrange reasonable accommodations must contact the instructor and Disability Services at the beginning of each semester. (If the diagnosis of the disability occurs during the academic year, the student must self-identify with the Disabilities Director as soon as possible in order to get academic accommodations in place for the remainder of the semester.) The Disability Office is located in Room 219 of the Student Center, telephone 501-279-4019.

Courses are taught online and students will not have direct access to the **Disability Services** located on the Harding University Searcy Campus. The student must self-identify to the instructor of the course and submit documentation by fax or mail to **Disability Services** on Harding University's main campus. The forms are available **online at** <http://www.harding.edu/disabilityservices>. Upon receiving the appropriate documentation approved by ADA Guidelines, academic accommodations may be set up by the instructor via a teleconference with the Disabilities Director. If you have questions, please contact Teresa J. McLeod, M. Ed., Disabilities Director, at 501-279-4019 or [tmcleod@harding.edu](mailto:tmcleod@harding.edu).

Since students on an international campus will not have access to the Disabilities Office located on Harding University's Searcy campus, the student must self-identify with the International Studies office prior to being accepted for a semester abroad. Reasonable academic accommodations (e.g. extended time on tests, a quiet room/no distractions for testing, etc.) may be made by the faculty on an international campus. However, a doctor's statement will be required for a physical or psychological disability stating that the student is capable of fully participating in the rigorous travel itinerary (group and independent travel), as well as, intense academics the semester he/she is abroad.



## Code of Academic Conduct

Students of Harding University are expected to be honorable and to observe standards of academic conduct appropriate to a community of Christian scholars. Harding University expects from its students a higher standard of conduct than the minimum required to avoid discipline. Harding expects its students to conduct themselves as responsible citizens in a Christian community. Enrollment at the University is viewed as a privilege that brings the attendant responsibilities and accountability. In order to encourage Christian living and growth, the University administers a student Code of Conduct. This code is provided to every student upon enrollment.

Upon registration to the University, students acknowledge and agree to abide by this code. Harding University reserves the right to refuse admission or dismiss students whose lifestyle is not consistent with the Christian principles for which Harding stands; and when the general welfare of the institution requires such action. Students suspended for disciplinary reasons during a semester may receive a grade of "F" in all courses for that semester. Please visit: <https://www.harding.edu/provost/academic-integrity> for further details.

### Academic Integrity Policy:

The goal of academic integrity is to achieve the highest level of integrity without need to invoke procedures or sanctions.

Honesty and integrity are characteristics that should describe each one of us as servants of Jesus Christ. As your instructor, I pledge that I will strive for honesty and integrity in how I handle the content of this course and in how I interact with each of you. I ask that you join me in pledging to do the same.

Academic dishonesty will result in penalties up to and including dismissal from the class with a failing grade and will be reported to the appropriate university official. All instances of dishonesty will be handled according to the procedures delineated in the Harding University catalog.

Cheating in all its forms is inconsistent with Christian faith and practice and will result in sanctions up to and including dismissal from the class with a failing grade.

### Referencing Information

As the accepted writing style of business, psychology, education, and social science programs across the globe, the American Psychological Association publication format (otherwise known as APA Style) is the required writing style for this course. Learning to conduct scholarly research is a natural part of academic work, and will help you succeed at Harding University. Conducting scholarly, professional and industry research is required for this course.

If a source is questionable, e.g., Wikipedia, other wikis, ask.com, answers.yahoo.com, etc., please contact your professor for clarity and permission before using a source that falls outside the scope of traditional academic standards. It is also important that you show how these references assisted your academic work; so make sure you reference your sources in every assignment you submit, no matter how mundane the assignment may be. Failure to properly and completely cite your sources may constitute plagiarism or cheating, as delineated in

the Academic Code of Conduct. Bottom line, remember these two simple rules: 1) give credit where credit is due, and 2) if it isn't your words, ideas or thoughts, it is someone else's and needs to be cited.

### **APA Resources and MLA Resources:**

<http://www.harding.edu/library/help>

### **Turnitin**

In order to assist in plagiarism prevention, Turnitin, an organization leading the way in both plagiarism detection and student learning will be utilized. Turnitin provides institutions, faculty, and students with a variety of academic tools, including originality checks, online grading capabilities, and even peer reviewed feedback. You should anticipate utilizing Turnitin for major assignments, e.g., research papers, research-based exams, etc.

### **Student Declaration**

Submitting an electronic document at Harding University constitutes an agreement with the following declaration:

- I affirm that the work submitted is of my own accord, is original, and contains the necessary and appropriate citations, where the work is of another source.
- I affirm that this assignment has not previously been submitted in any form.
- When submitting assignments to Turnitin, I acknowledge and adhere to its disclaimer statements.
- To uphold Harding University's [Code of Academic Integrity \(Undergraduate\)](#).

### **Academic Grievance Policy**

If a student believes that he or she has reason to question the decision of a faculty member with regard to the final grade received in a course or the unreasonable denial of academic progression, a procedure has been established to resolve the grievance. The student must register his or her complaint in writing to the faculty member within seven business days following the alleged incident, except that if the grievance involves a final grade, it must be filed within ten business days after final grades are posted by the Registrar. Within the written complaint, the student must set forth reasons and grounds for the grievance. The policy set forth in the undergraduate catalog titled [Academic Grievance Procedure](#) establishes the procedures for such grievance resolution. The policy set forth in the graduate catalog titled [Academic Grievance Procedure](#) establishes the procedures for such grievance resolution. All students should be familiar with this policy.

### **Credit Hour Calculator Statement / Time Management Expectations**

All courses at Harding University meet federal and HLC regulations and meet or exceed university requirements regarding credit hours.

For every course credit hour, the typical student should expect to spend at least forty-five clock hours of concentrated attention on course-related work, including but not limited to time attending class, as well as out-of-class time spent reading, reviewing, organizing notes, preparing for upcoming quizzes/exams, problem

solving, developing and completing projects, and other activities that enhance learning. Thus, for a three-hour course, a typical student should expect to spend at least one hundred thirty-five hours dedicated to the course.

**Dress Code:** You must adhere to the dress code for all work done in a course, where either a static or video image of yourself is submitted.

# Course Policies

## Course Academic Conduct

All acts of dishonesty in any academic work constitute academic misconduct. As a student of Harding University, you should avoid all cases that will be construed as academic misconduct. This includes, but is not necessarily limited to, the following:

1. *Cheating*: Use or attempted use of unauthorized materials, information or study aids in any academic exercise.
2. *Plagiarism*: Representing the words, ideas or data of another as your own in any academic exercise.
3. *Fabrication*: Falsification or unauthorized invention of any information or citation in an academic exercise.
4. *Aiding and Abetting Academic Dishonesty*: Intentionally helping or attempting to help another student commit an act of academic dishonesty.
5. *Conduct unbecoming a professional while participating in a practicum, internship, field experience, or any similar academic experience*: Conduct unbecoming a professional includes, but is not limited to, standards of conduct stated in the general Harding University catalog as well as standards and codes of conduct associated with professional organizations related to the student's academic discipline.
6. *Respect*: Students are expected to respect other classmates' opinions and ideas at all times. Since online students cannot see body language and other nonverbal cues, it is essential that comments be worded carefully and refrain from such things as sarcasm, which can be taken negatively in the online world. Read posts for content and then read posts for context. If the message can be taken negatively in any way, the suggestion is to re-word the post until you are sure that it will not be taken defensively. Another key issue is to refrain from certain discussions that evoke strong reaction. This may include such things as:
  - a. Stereotypes of any nature, whether it be profession or class of people
  - b. Politics – whether republican, democrat or liberal etc., respect should be shown in differences of opinions and ideas.
7. *Lurking*: Lurking is when a student signs on and reads the messages and does not post to the classroom. There are many reasons why a student may do this. Some students may feel uncomfortable sharing views in an open forum, may be unsure of the materials being covered, and/or may not want to say the same or similar things that other students have already posted. Discuss these issues with your instructor. Posting [x] out of [x] days is essential to learning and to passing an online class. Lurking is not counted as participation and will only lower your grade. Your instructor may be able to assist you in overcoming or resolving any issue that may drive lurking behavior.
8. *Drifting*: Drifting occurs when the discussion goes in another direction than expected. Drifting is normal and encouraged in the online environment. However, the drifting must be related to academics and the materials discussed in the classroom. The instructor will encourage positive drifting, but will discourage inappropriate drifting and may ask students to take it to the CHAT room or to discuss it through personal email. Inappropriate drift will not be counted toward the participation grade.

## **Canvas or Internet Outage Policy**

As a learner, you must be able to manage technical difficulties; such as power outages, connection problems, and other technical issues. Technology will sometimes fail, for this reason, it is advisable to complete your assigned work prior to the due date.

### **Instructor**

If your instructor experiences power outage, Internet service outage, LMS (Canvas) or other technical issues that significantly affects the timing of distributing online assignments, grading assignments or significantly interferes with communicating with students, adjustments to due dates will be made.

### **Student**

If you experience power outage, Internet service outage, LMS (Canvas) or other technical issues, nonetheless you are held responsible for completing your assigned work in a timely manner. Harding University is not responsible for the student's access to a working computer or reliable Internet service. Internet outage or computer issues is not an excuse for late work. A backup plan for reliable Internet service and working computer is prudent.

### **Testing Issues**

If you experience issues with Internet connection, power outage, computer, or Canvas and are unable to complete or submit the test, do not panic. Your first step is to contact your instructor, who will provide you instructions on how to proceed. You may also report a problem to the e-learning help desk (501-279-5201). Response time is dependent on the time of day. E-learning help desk is manned M-F: 8:00 am – 5:00 pm.

Harding offers a wide variety of academic support services. While this list is not all-inclusive, the following links may be useful to students (some services may not be applicable for graduate students):

[Library Resources Testing](#)

[Services Tutoring](#)

[Writing Lab](#)

[Registration](#)

[Financial Aid Student Life Counseling](#)

[Career Services](#) (M.B.A. students can also utilize the [Center for Professional Excellence](#))

[Seminars/Workshops](#)

### **Changes to Syllabus Notice**

The instructor reserves the right to modify and update any part of the syllabus where necessary. It is your responsibility to stay up to date with any changes communicated by the professor.

## References

*American Psychological Association Website*. (2014). Retrieved from <https://www.apa.org/about/apa/archives/apa-history.aspx>

[[HULearn](#)] (2016, September 27). Working with Turnitin in Canvas. [Video file]. Retrieved from <https://youtu.be/tfE90M0t4TE>