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PARTICLES OF FAITH

TEACHER RESOURCE GUIDE

CONTENTS

INTRODUCTION TO THE *PARTICLES OF FAITH TEACHER RESOURCE GUIDE*

COURSE DESCRIPTION

Teaching a course (or unit) on faith and science is different than other courses because it integrates across disciplines and is therefore not an established discipline unto itself. This uniqueness means that you do not need to be an expert either on the physical or biological sciences or on dogmatic theology to be able to teach this course. Think of teaching this course as an opportunity to learn along with your students, something every teacher does anyway. The *Particles of Faith: A Catholic Guide to Navigating Science* is designed to provide the content of the course. It is intended to be read by high school students *and* their teachers!

There are many faith and science courses for adults, particularly in colleges and universities and in catechetical training programs. There are some faith and science courses for high school, but there are no other systematic courses such as this one that include an in-depth discussion of physics, chemistry, and biology interwoven with theology. This is truly a "science in the light of faith" course.

The course does not include as much physics, chemistry, and biology as an entire year of study in any of those subjects, but students who have taken, or are taking, those high school science courses will recognize the basics of atomic theory, quantum theory, evolutionary biology, and developmental biology. Students who have not taken those science courses need not worry either. That is another unique feature of this course: *it isn't about teaching the content so much as it is about instilling an idea*.

COURSE AND CHAPTER OBJECTIVES

What idea does the content of this course instill? It is the Christian worldview that science is the study of the handiwork of God. By teaching the next generation that "science is the study of the handiwork of God," you will be inoculating them against the unfortunate conflict myth so prevalent in our culture. The goal is to show the students so thoroughly that science comes to life when viewed as the opportunity to know God better through creation, that the students know instinctively that there is no conflict between Christian theology and modern science. This lesson is taught in **Chapter 1, "The Navigation Process?"**

Leading souls to heaven is always the top priority, but there is another very important reason to teach this course. Humanity needs future scientists who not only have the correct philosophical and theological worldview but also understand that the human person—both body and rational soul—must practice virtue to realize his or her maximum power. **Chapter 2, "What Does Christianity Contribute to Science?,"** explains how modern science—namely, classical physics—was born of the Christian worldview that God created everything out of nothing in the beginning, with order and goodness. This view is only found in the philosophical and theological outlook formed by faith in the incarnational and trinitarian God of Christianity.

Modern science was born of Christianity and its reasonable worldview of the order in nature. Genesis 1:1 says, "In the beginning God created the heavens and the earth." And John 1:1 says, "In the beginning was the Word." Reading the Bible typologically, Catholics expect to find order and reason in creation.

Today, we live in a time when, one might say, modern science has grown from a newborn to an adolescent awkwardly stretching its legs and becoming independent. Many people, especially non-Catholics or atheists, would say that science has nothing to do with the Catholic Church. But this is a misunderstanding of history, philosophy, and theology. The problem of our time is that science *still needs the guidance of the Church*, particularly regarding virtue. Just because something in science can be done, doesn't mean it ought to be done. Science needs a correct philosophical view that does not ignore the human soul or the origin of everything, which is God.

Make no mistake: the future of science depends on raising an army of future Catholic scientists who can guide science in a way that will benefit humanity. Otherwise, scientific progress could bring confusion and disaster. So, thank you for teaching this course! You are helping to build that army.

The other chapters form a tour of different scientific issues in light of theology. **Chapter 3, "Does the Big Bang Prove God?,"** explains why science, in general, should never be used to prove what we hold in faith and based on divine revelation. Faith must come first. Once this is understood, then it becomes clear why the study of the handiwork of God (my definition for science) could never, ever disprove that God exists, any more than a bowl of spaghetti could disprove that a mom exists.

Chapter 4, "How Should We Understand the World of Atoms?," moves into chemistry. As I remind you and the students often, you do not need to know chemistry to grasp the point. Nor do you need to study this chapter to memorize the details of the history of the atomic model. Memorization is not the goal. The goal is to change the way we think of science. The detail is given to drive home the point: God's handiwork is amazing! Nothing shows that science can enrich our faith quite as fundamentally and pervasively as the atom.

Chapter 5, "Does Quantum Mechanics Allow for Free Will?," gets into the philosophical interpretations of modern physics and the implications they have on our understanding of the human person. The lesson of this chapter is that free will is a spiritual power and does not, therefore, need a physical explanation. Again, the purpose is to safeguard the truth of the human person, made in the image and likeness of God.

Chapter 6, "Did We Evolve from Atoms?," directly confronts the false idea that evolution must be disproven for faith to be reasonable. God created atoms, and they do their thing astonishingly well. Since atomic particles are constantly in motion, they are always changing and evolving. It is only natural that evolution of matter occurs.

Chapter 7, "Can a Christian Accept the Theory of Evolution?," is the longest chapter, and it provides the basics in both evolutionary biology and Catholic theology for anyone to become conversant on the topic. This chapter comes after the other chapters on the cosmic beginning and evolution of matter because it ties together the ideas presented to this point. Chapter 7 is broken into two parts: the theology and the science. As before, the scientific concepts are not given for

memorization (that is done in biology class); they are laid out in enough detail for the students to gain an appreciation of the complexity of the issue.

Chapter 8, "When Does a Human Life Begin?," discusses the different views on the beginning of human life, with a clear explanation and justification of Catholic teaching. A human life begins at conception and must be respected as a person even though it is impossible to pinpoint an exact moment in time when a soul unites with a human body. This topic comes last and unites everything that has been taught in the book.

COURSE SCHEDULING OPTIONS

There are many ways to cover the material in *Particles of Faith: A Catholic Guide to Navigating Science* with your students. This book may serve as the main text for a separate one-semester faith and science course, usually offered as a course in a high school theology curriculum. The book may also support a unit in other theology courses. If so, a teacher might choose to teach faith and science consecutively over four or eight weeks, or teach a faith and science unit once or twice a week throughout a semester. Similarly, the material in *Particles of Faith* might make up a unit in a science coursed offered by a Catholic high school.

Listed below are three scheduling models for a 4-week course, 8-week course, or 16-week course, breaking down how to assign and teach with *Particles of Faith: A Catholic Guide to Navigating Scienc*e.

4-Week Course

WEEK 1	Lesson A	The Navigation Process	Introduction and Chapter 1
	Lesson B	What Does Christianity Contribute to Science?	Chapter 2
WEEK 2	Lesson A	Does the Big Bang Prove God?	Chapter 3
	Lesson B	How Should We Understand the World of Atoms?	Chapter 4
WEEK 3	Lesson A	Does Quantum Mechanics Allow for Free Will?	Chapter 5
	Lesson B	Did We Evolve from Atoms?	Chapter 6

WEEK 4	Lesson A	Can a Christian Accept the Theory of Evolution?	Chapter 7
	Lesson B	When Does a Human Life Begin?	Chapter 8 and Summary

8-Week Course

WEEK 1	The Navigation Process	Introduction and Chapter 1
WEEK 2	What Does Christianity Contribute to Science?	Chapter 2
WEEK 3	Does the Big Bang Prove God?	Chapter 3
WEEK 4	How Should We Understand the World of Atoms?	Chapter 4
WEEK 5	Does Quantum Mechanics Allow for Free Will?	Chapter 5
WEEK 6	Did We Evolve from Atoms?	Chapter 6
WEEK 7	Can a Christian Accept the Theory of Evolution?	Chapter 7
WEEK 8	When Does a Human Life Begin?	Chapter 8 and Summary

16-Week Course

WEEK 1	Welcome to a Course on Faith and Science!	Introduction
WEEK 2	The Navigation Process	Chapter 1
WEEK 3	What Does Christianity Contribute to Science?	Chapter 2

WEEK 4	Does the Big Bang Prove God?	Chapter 3
WEEK 5	Exam 1	
WEEK 6	How Should We Understand the World of Atoms?	Chapter 4
WEEK 7	Does Quantum Mechanics Allow for Free Will?	Chapter 5
WEEK 8	Midterm Exam	
WEEK 9	Did We Evolve from Atoms?	Chapter 6
WEEK 10	Can a Christian Accept the Theory of Evolution? Theology and Evolution	Chapter 7, Part 1
WEEK 11	Exam 3	
WEEK 12	Can a Christian Accept the Theory of Evolution? Science of Evolution	Chapter 7, Part 2
WEEK 13	When Does a Human Life Begin?	Chapter 8
WEEK 14	We Don't Need to Choose between Faith and Science	Summary
WEEK 15	Final Exam	
WEEK 16	Course Paper Due	

TEACHING APPROACHES

Given the nature of this course, particularly that it requires only basic knowledge of both theology and the physical and biological sciences and that it is meant to teach the Catholic worldview more than to teach memorizable details, there are three teaching approaches offered in the lesson plans. They vary according to the amount of customization the teacher desires. The three teaching approaches are the Fixed approach, the Modified approach, and the Customizable approach.

Fixed Approach

The first teaching approach is the "**Fixed**" approach. This set of lesson scheduling requires the least amount of preparation time. Each lesson gives specific instructions for reading the textbook, viewing the teaching videos, assigning the chapter assessment Reading Comprehension and Critical Thinking and Writing questions, and assessing learning with exams that are provided. A Fixed package is provided for each of the 4-week, 8-week, and 16-week course scheduling options. This approach is recommended for instructors who are teaching this course for the first time or who would like to learn either the theological or the scientific content along with the students until they are comfortable changing how the course is taught to tailor the presentation to the students. *Note*: This approach does *not* require students to read Chapter 7, Part 2: "The Science of Evolution." Students are only responsible for reading Chapter 7, Part 1: "Theology of Evolution."

Modified Approach

The second teaching approach is the "**Modified**" approach. This set of lesson plans allows for some flexibility in the presentation of the content but also provides plenty of guidance for the instructor. Each lesson gives instructions for reading the textbook, viewing the teaching videos, assigning the Chapter Assessment Reading Comprehension and Critical Thinking and Writing questions, and assessing learning with exams that are provided, along with suggestions for some variation. A Modified package is provided for each of the 4-week, 8-week, and 16-week course scheduling options. This approach is recommended for instructors who are teaching this course for the second or third time or who like a balance of variety of arrangement of lessons, materials, and assignments. *Note*: This approach provides the option for students to read all of Chapter 7, either Part 1 or Part 2, or selections from both parts, based upon your discretion.

Customizable Approach

The third teaching approach is the "**Customizable**" approach. This set of lesson plans offers the most flexibility but requires the most preparation time. Each lesson gives suggestions for reading the textbook, viewing the teaching videos, assigning the Chapter Assessment Reading Comprehension and Critical Thinking and Writing questions, and assessing learning with exams that are provided, but leaves the details for conducting the class to the instructor with plenty of room for adding new content to go beyond the material in the textbook. A Customizable package is provided for each of the 4-week, 8-week, and 16-week course scheduling options. This approach is recommended for instructors who are confident in the material and wish to tailor the course to their students the most. *Note*: This approach requires students to read Chapter 7, Part 1: "Theology and Evolution" *and* Part 2: "The Science of Evolution."

Use and adapt the teacher resources and scheduling plans as you choose. Quizzes, tests, exams, videos, and PowerPoint slides are also provided at www.avemariapress.com/resources.

4-WEEK COURSE SCHEDULES

FIXED APPROACH

Course Preparation and Assessment Scale

Have the students obtain a notebook or composition book to record their assignments. If you are doing the class digitally, have the students make a Word or Google document to record their assignments. The students should organize the work by week (1, 2, 3, 4) and lessons (A and B in each week). Each lesson will contain a vocabulary list and responses to Chapter Assessments. The lesson plans are organized for 50-minute class periods, two classes per week.

Grade the work each week, either by taking up the notebooks or the sheets of paper or by accessing the digital file. The vocabulary definitions are listed in the book. Rather than have the students rewrite each definition, have them memorize the definitions. Then quiz them on one or two sample terms to gauge understanding. Or have them write some or all of the terms in sentences.

Grade the Chapter Assessments as follows:

- 15 points for each correct Reading Comprehension response
- 25 points for each correct Critical Thinking and Writing response

The responses should be full sentences. Answers are included at www.avemariapress.com/resources.

For the overall course grade, weight the vocabulary scores 20 percent and the Chapter Assessment scores the other 80 percent. Optional chapter quizzes, a midterm exam, and a final exam are included in the online teacher resource section; however, for a 4-week course, a final exam is not recommended. Rather, base the student's entire final grade on the lesson assignments. For other ideas, refer to the Modified and Customizable teaching approaches.

Week 1

Lesson A: The Navigation Process

Share the first reading assignment via a welcome letter or class syllabus so the students can have it read before they come to class:

- Introduction: Welcome to a Course on Faith and Science! (pages xi–xv)
- Unit I, "Science in the Light of Faith" (page 1)
- Chapter 1, "The Navigation Process" (pages 3–24)

Review procedures for completing assignments. (10 minutes)

Watch the following videos in class.

- Introduction: Welcome to a Course on Faith and Science! (15 minutes) video link
- Chapter 1: The Navigation Process (18 minutes) video link

Discuss Critical Thinking and Writing (page 25), number 12. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

science	universe	evangelize	atom
dichotomy	universe	provisional	Magisterium
dogma	divine revelation	physics	infallible
theologians	exegetes	quantum theory	system of wills
supreme law	physical realm	laws of nature	free will
intellect	angels	humans	rational souls
instinct	discursive	miracle	nature
supernature			

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 1 (page 24), numbers 2, 3, 7, 8, 11
  - Critical Thinking and Writing, Chapter 1 (page 25), number 14
- Read the textbook.
  - Chapter 2, "What Does Christianity Contribute to Science?" (pages 27–39)

Lesson B: What Does Christianity Contribute to Science?

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 2: What Does Christianity Contribute to Science? (30 minutes) video link

Discuss Critical Thinking and Writing (page 40), number 10. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

pantheistic	animistic	mythological	Taoism
first principles	personification	Hellenistic	creation *ex nihilo*
Maccabees	martyrdom	perfect year	celestial bodies
apologists	pagans	cosmology	

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 2 (page 40), numbers 1, 2, 3, 6, 7
  - Critical Thinking and Writing, Chapter 2 (page 40), number 11
- Read the textbook.
  - Unit II, "Questions in the Physical Sciences" (pages 43–44)
  - Chapter 3, "Does the Big Bang Prove God?" (pages 45–62)

Week 2

Lesson A: Does the Big Bang Prove God?

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 3: Does the Big Bang Prove God? (32 minutes) video link

Discuss Critical Thinking and Writing (page 63), number 9. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions these words.

general relativity	Big Bang theory	primordial
philosophical	metaphysical	religious
exponential	gravitational waves	cosmic inflation
interstellar dust	inductive proofs	deductive proofs
Borde-Guth-Vilenkin theorem	probative force	subatomic particles

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 3 (pages 62–63), numbers 2, 3, 4, 6, 7
  - Critical Thinking and Writing, Chapter 3 (page 63), number 11
- Read the textbook.
  - Chapter 4, "How Should We Understand the World of Atoms?" (pages 65–87)

Lesson B: How Should We Understand the World of Atoms?

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 4: How Should We Understand the World of Atoms? (31 minutes) video link

Discuss Critical Thinking and Writing (page 88), number 9. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

chemistry	volition	mole
classical mechanics	quantum mechanics	nucleus
neutrons	protons	electron
orbitals	electromagnetic force	compounds
mass	charge	electron configurations
Pauli exclusion principle	Hund's rule	Heisenberg's uncertainty principle
electromagnetic radiation	atomic spectra	atomic mass
wave-particle duality	interference pattern	photons
quantum	symmetry	dipole moment
gravity	nuclear force	radioactive decay
fermions	bosons	hadrons
leptons	antiparticles	mesons
quark model	quarks	neutrino
positron	antimatter	gluons
Higgs boson	grand unification theories	string theory
prescriptive laws	descriptive laws	

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 4 (page 87), numbers 1, 2, 3, 6, 8
  - Critical Thinking and Writing, Chapter 4 (page 88), number 15
- Read the textbook.
  - Chapter 5, "Does Quantum Mechanics Allow for Free Will?" (pages 89–107)

Week 3

Lesson A: Does Quantum Mechanics Allow for Free Will?

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 5: Does Quantum Mechanics Allow for Free Will? (28 minutes) video link

Discuss Critical Thinking and Writing (page 108), number 17. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

determinism	anticausal interpretation	hidden variables
ontological	operational	absolute
ideal gas equation	person	abstractions
logic		

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 5 (pages 107–8), numbers 1, 2, 3, 6, 12
  - Critical Thinking and Writing, Chapter 5 (page 109), number 19
- Read the textbook.
  - Unit III, "Questions in the Biological Sciences" (page 111)
  - Chapter 6, "Did We Evolve from Atoms?" (pages 113–27)

Lesson B: Did We Evolve from Atoms?

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 6: Did We Evolve from Atoms? (28 minutes) video link

Discuss Critical Thinking and Writing (page 128), number 13. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

evolution	biology	clone
computational models	nebula	red giant
white dwarf	supernova explosion	glorified bodies
chemical evolution	spontaneous generation	biogenesis
abiogenesis	prebiotic	proteins
carbohydrates	nucleic acids	primordial soup
biological evolution	protocell	artificial life
potentialities		

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 6 (page 128), numbers 1, 3, 4, 7, 8
  - Critical Thinking and Writing, Chapter 6 (page 128), number 13
- Read the textbook.
  - Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 1, "Theology and Evolution" (pages 131–51)

Week 4

Lesson A: Can a Christian Accept the Theory of Evolution?

Note: This chapter is divided into two parts, one on the theology of evolution and one on the science of evolution. This lesson focuses solely on Part 1.

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 1: Theology and Evolution (31 minutes) video link

Discuss Critical Thinking and Writing (page 153), number 14. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

genomes	scientism	corporeal
monogenism	polygenism	deoxyribonucleic acid (DNA)

- Do the Chapter Assessments.
  - Reading Comprehension, Chapter 7, Part 1 (page 152), numbers 1, 2, 3, 7, 8
  - Critical Thinking and Writing, Chapter 7, Part 1 (page 153), number 16
- Read the textbook.
  - Chapter 8, "When Does a Human Life Begin?" (pages 193–204)
  - Summary, "We Don't Need to Choose between Faith and Science" (pages 207–12)

Lesson B: When Does a Human Life Begin?

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following videos.

- Chapter 8: When Does a Human Life Begin? (16 minutes) video link
- Conclusion: We Don't Need to Choose Between Faith and Science (9 minutes) video link

Discuss Critical Thinking and Writing (page 205), number 7. (5 minutes)

Give the last assignments. (5 minutes)

- Learn the definitions of these words.

sperm	egg	gametes	zygote
gastrulation	blastula	monozygotic	blastomeres
brain waves	electroencephalograph (EEG)	conception	

- Do the Chapter Assessments.
  - Reading Comprehension, Chapter 8 (pages 204–5), numbers 2, 3, 4, 5, 6
  - Critical Thinking and Writing, Chapter 8 (page 205), number 8

MODIFIED APPROACH

Course Preparation and Assessment Scale

Have the students obtain a notebook or composition book to record their assignments. If you are doing the class digitally, have the students make a Word or Google document to record their assignments. The students should organize the work by week (1, 2, 3, 4) and lessons (A and B in each week). Each lesson will contain a vocabulary list and responses to Chapter Assessments. The lesson plans are organized for 50-minute class periods, two classes per week.

Grade the work each week, either by taking up the notebooks or the sheets of paper or by accessing the digital file. The vocabulary definitions are listed in the book. Rather than have the students

rewrite each definition, have them memorize the definitions. Then quiz them on one or two sample terms to gauge understanding. Or have them write some or all of the terms in sentences.

Grade the Chapter Assessments as follows:

- 15 points for each correct for the Reading Comprehension response
- 25 points for each correct Critical Thinking and Writing response.

The responses should be full sentences. Answers are included at www.avemariapress.com/resources.

For the overall course grade, weight the vocabulary scores 20 percent and the Chapter Assessment scores the other 80 percent. Optional chapter quizzes, a midterm exam, and a final text are included in the online teacher resource section; however, for a 4-week course, a final exam is not recommended. Rather, base the student's entire final grade on the lesson assignments. For other ideas, refer to the Fixed and Customizable teaching approaches.

Week 1

Lesson A: The Navigation Process

Share the first reading assignment via a welcome letter or class syllabus so the students can have it read before they come to class:

- Introduction: Welcome to a Course on Faith and Science! (pages xi–xv)
- Unit I, "Science in the Light of Faith" (page 1)

Chapter 1, "The Navigation Process" (pages 3–24)

Review procedures for completing assignments. (10 minutes)

Watch the following videos either in class or as an assignment outside of class.

- Introduction: Welcome to a Course on Faith and Science! (15 minutes) video link
- Chapter 1: The Navigation Process (18 minutes) video link

Choose two to four of the Critical Thinking and Writing questions (page 25) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

science	universe	evangelize	atom
dichotomy	universe	provisional	Magisterium
dogma	divine revelation	physics	infallible
theologians	exegetes	quantum theory	system of wills
supreme law	physical realm	laws of nature	free will

intellect	angels	humans	rational souls
instinct	discursive	miracle	nature
supernature			

- Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.
  - Reading Comprehension, Chapter 1 (page 24), choose five questions
  - Critical Thinking and Writing, Chapter 1 (page 25), choose one question
- Read the textbook.
  - Chapter 2, "What Does Christianity Contribute to Science?" (pages 27–39)

Lesson B: What Does Christianity Contribute to Science?

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch the following video either in class or as an assignment outside of class.

- Chapter 2: What Does Christianity Contribute to Science? (30 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (pages 40–41) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

pantheistic	animistic	mythological	Taoism
first principles	personification	Hellenistic	creation *ex nihilo*
Maccabees	martyrdom	perfect year	celestial bodies
apologists	pagans	cosmology	

- Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.
  - Reading Comprehension, Chapter 2 (page 40), chose five questions
  - Critical Thinking and Writing, Chapter 2 (pages 40–41), choose one question
- Read the textbook.
  - Unit II, "Questions in the Physical Sciences" (pages 43–44)
  - Chapter 3, "Does the Big Bang Prove God?" (pages 45–62)

Week 2

Lesson A: Does the Big Bang Prove God?

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch the following video either in class or assign it for viewing outside the classroom.

- Chapter 3: Does the Big Bang Prove God? (32 minutes) video link

Choose three to five Critical Thinking and Writing questions (page 63) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

general relativity	Big Bang theory	primordial	philosophical
metaphysical	religious	exponential	gravitational waves
cosmic inflation	interstellar dust	inductive proofs	deductive proofs
Borde-Guth-Vilenkin theorem	probative force	subatomic particles	

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 3 (pages 62–63), choose any five questions
  - Critical Thinking and Writing, Chapter 3 (page 63), choose any question
- Read the textbook.
  - Chapter 4, "How Should We Understand the World of Atoms?" (pages 65–87)

Lesson B: How Should We Understand the World of Atoms?

Review the previous lesson with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch the following video either in class or as an assignment outside of class.

- Chapter 4: How Should We Understand the World of Atoms? (31 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (page 88) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

chemistry	volition	mole
classical mechanics	quantum mechanics	nucleus
neutrons	protons	electron
orbitals	electromagnetic force	compounds
mass	charge	electron configurations
Pauli exclusion principle	Hund's rule	Heisenberg's uncertainty principle
electromagnetic radiation	atomic spectra	atomic mass
wave-particle duality	interference pattern	photons
quantum	symmetry	dipole moment
gravity	nuclear force	radioactive decay
fermions	bosons	hadrons
leptons	antiparticles	mesons
quark model	quarks	neutrino
positron	antimatter	gluons
Higgs boson	grand unification theories	string theory
prescriptive laws	descriptive laws	

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 4 (page 87), choose any five questions
  - Critical Thinking and Writing, Chapter 4 (page 88), choose any question
- Read the textbook.
  - Chapter 5, "Does Quantum Mechanics Allow for Free Will?" (pages 89–107)

Week 3

Lesson A: Does Quantum Mechanics Allow for Free Will?

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch the following video either in class or as an assignment outside of class.

- Chapter 5: Does Quantum Mechanics Allow for Free Will? (28 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (pages 108–9) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

determinism	anticausal interpretation	hidden variables	ontological
operational	absolute	ideal gas equation	person
abstractions	logic		

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 5 (pages 107–8), choose any five questions
  - Critical Thinking and Writing, Chapter 5 (page 109), choose any question
- Read the textbook.
  - Unit III, "Questions in the Biological Sciences" (page 111)
  - Chapter 6, "Did We Evolve from Atoms?" (pages 113–27)

Lesson B: Did We Evolve from Atoms?

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch the following video either in class or as an assignment outside of class.

- Chapter 6: Did We Evolve from Atoms? (28 minutes) video link

Choose three to five of the of the Critical Thinking and Writing questions (pages 128–29) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

evolution	biology	clone	computational models
nebula	red giant	white dwarf	supernova explosion
glorified bodies	chemical evolution	spontaneous generation	biogenesis
abiogenesis	prebiotic	proteins	carbohydrates
nucleic acids	primordial soup	biological evolution	protocell
artificial life	potentialities		

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 6 (page 128), choose any five questions
  - Critical Thinking and Writing, Chapter 6 (pages 128–29), chose any question

- Read the textbook.
  - Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 1, "Theology and Evolution" (pages 131–51)
  - Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 2, "The Science of Evolution" (pages 154–89)

Week 4

Lesson A: Can a Christian Accept the Theory of Evolution?

Note: This chapter is divided into two parts, one on the theology of evolution and one on the science of evolution. Decide whether to assign all of it or only one part, or whether to select certain sections with topics that are of interest to the students. If the whole chapter is assigned, give the students a warning that this week will be more demanding. The students can also read the extra material on their own after the short course ends.

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch either one or both of the following videos either in class or as an assignment outside of class.

- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 1: Theology and Evolution (31 minutes) video link
- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 2: Science of Evolution (38 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (page 153 or pages 190–91) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.
  - Chapter 7, Part 1:

genomes	scientism	corporeal
monogenism	polygenism	deoxyribonucleic acid (DNA)

  - Chapter 7, Part 2:

microevolution	macroevolution	natural selection
gene	genetic drift	speciation
traits	phenotype	genotype
fossil record	comparative anatomy	strata
bacteria	cyanobacteria	fission

eukaryotes	Cambrian period	Cambrian explosion
invertebrates	chordates	vascular plants
spores	angiosperms	geographical distribution
continental drift	genetics	nucleotides
amino acids	recombination	homologous
paleoanthropology	hominids	mitochondrial DNA
genetic bottleneck	cytoplasm	organelles
mitochondria	Y-chromosome	

- Do the Chapter Assessments.
  - Reading Comprehension, Chapter 7, Part 1 (page 152), choose any five questions
  - Reading Comprehension, Chapter 7, Part 2 (pages 189–90), choose any five questions
  - Critical Thinking and Writing, Chapter 7, Part 1 (page 153), choose any question
  - Critical Thinking and Writing, Chapter 7, Part 2 (pages 190–91), choose any question
- Read the textbook.
  - Chapter 8, "When Does a Human Life Begin?" (pages 193–204)
  - Summary, "We Don't Need to Choose between Faith and Science" (pages 207–12)

Lesson B: When Does a Human Life Begin?

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch the following videos either in class or as an assignment outside of class.

- Chapter 8: When Does a Human Life Begin? (16 minutes) video link
- Conclusion: We Don't Need to Choose Between Faith and Science (9 minutes) video link

Choose three of the Critical Thinking and Writing questions (page 205) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

sperm	egg	gametes	zygote
gastrulation	blastula	monozygotic	blastomeres
brain waves	electroencephalograph (EEG)	conception	

- Do the Chapter Assessments.
  - Reading Comprehension, Chapter 8 (pages 204–5), choose any five questions
  - Critical Thinking and Writing, Chapter 8 (page 205), choose any question

CUSTOMIZABLE APPROACH

Course Preparation and Assessment Scale

Have the students obtain a notebook or composition book to record their assignments. If you are doing the class digitally, have the students make a Word or Google document to record their assignments. The students should organize the work by week (1, 2, 3, 4) and lessons (A and B in each Week). Each lesson will contain a vocabulary list and responses to Chapter Assessments. Select from any of the recommendations to tailor the course, including adding your own lecture.

For the 4-week course, a final exam is not recommended. Base the whole grade on the lesson assignments. Using the teacher materials, customize the course as you desire. For more specific lesson plans, refer to the Fixed and Modified teaching approaches.

Week 1

Lesson A: The Navigation Process

Share the first reading assignment via a welcome letter or class syllabus so the students can have it read before they come to class:

- Introduction: Welcome to a Course on Faith and Science! (pages xi–xv)
- Unit I, "Science in the Light of Faith" (page 1)

Chapter 1, "The Navigation Process" (pages 3–24)

Watch the following videos either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Introduction: Welcome to a Course on Faith and Science! (15 minutes) video link
- Chapter 1: The Navigation Process (18 minutes) video link

Choose two to four of the Critical Thinking and Writing questions (page 25) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

science	universe	evangelize	atom
dichotomy	supernature	provisional	Magisterium
dogma	divine revelation	physics	infallible
theologians	exegetes	quantum theory	system of wills

supreme law	physical realm	laws of nature	free will
intellect	angels	humans	rational souls
instinct	discursive	miracle	nature

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 1 (page 24)
- Critical Thinking and Writing, Chapter 1 (page 25)

Assign the textbook reading for the next class.

- Chapter 2, "What Does Christianity Contribute to Science?" (pages 27–39)

Lesson B: What Does Christianity Contribute to Science?

Watch the following video either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 2: What Does Christianity Contribute to Science? (30 minutes) video link

Choose three to five of the of the Critical Thinking and Writing questions (pages 40–41) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

pantheistic	animistic	mythological	Taoism
first principles	personification	Hellenistic	creation *ex nihilo*
Maccabees	martyrdom	perfect year	celestial bodies
apologists	pagans	cosmology	

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 2 (page 40)
- Critical Thinking and Writing, Chapter 2 (pages 40–41)

Assign the textbook reading for the next class.

- Unit II, "Questions in the Physical Sciences" (pages 43–44)
- Chapter 3, "Does the Big Bang Prove God?" (pages 45–62)

Week 2

Lesson A: Does the Big Bang Prove God?

Watch the following video either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 3: Does the Big Bang Prove God? (32 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (page 63) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

general relativity	Big Bang theory	primordial
philosophical	metaphysical	religious
exponential	gravitational waves	cosmic inflation
interstellar dust	inductive proofs	deductive proofs
Borde-Guth-Vilenkin theorem	probative force	subatomic particles

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 3 (pages 62–63)
- Critical Thinking and Writing, Chapter 3 (page 63)

Assign the textbook reading for the next class.

- Chapter 4, "How Should We Understand the World of Atoms?" (pages 65–87)

Lesson B: How Should We Understand the World of Atoms?

Watch the following video either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 4: How Should We Understand the World of Atoms? (31 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (page 88) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

chemistry	volition	mole
classical mechanics	quantum mechanics	nucleus
neutrons	protons	electron

orbitals	electromagnetic force	compounds
mass	charge	electron configurations
Pauli exclusion principle	Hund's rule	Heisenberg's uncertainty principle
electromagnetic radiation	atomic spectra	atomic mass
wave-particle duality	interference pattern	photons
quantum	symmetry	dipole moment
gravity	nuclear force	radioactive decay
fermions	bosons	hadrons
leptons	antiparticles	mesons
quark model	quarks	neutrino
positron	antimatter	gluons
Higgs boson	grand unification theories	string theory
prescriptive laws	descriptive laws	

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 4 (page 87)
- Critical Thinking and Writing, Chapter 4 (page 88)

Assign the textbook reading for the next class.

- Chapter 5, "Does Quantum Mechanics Allow for Free Will?" (pages 89–107)

Week 3

Lesson A: Does Quantum Mechanics Allow for Free Will?

Watch the following video either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 5: Does Quantum Mechanics Allow for Free Will? (28 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (pages 108–9) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

determinism	anticausal interpretation	hidden variables	ontological

operational	absolute	ideal gas equation	person
abstractions	logic		

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 5 (pages 107–8)
- Critical Thinking and Writing, Chapter 5 (page 108–9)

Assign the textbook reading for the next class.

- Unit III, "Questions in the Biological Sciences" (page 111)
- Chapter 6, "Did We Evolve from Atoms?" (pages 113–27)

Lesson B: Did We Evolve from Atoms?

Watch the following video either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 6: Did We Evolve from Atoms? (28 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (pages 128–29) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

evolution	biology	clone
computational models	nebula	red giant
white dwarf	supernova explosion	glorified bodies
chemical evolution	spontaneous generation	biogenesis
abiogenesis	prebiotic	proteins
carbohydrates	nucleic acids	primordial soup
biological evolution	protocell	artificial life
potentialities		

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 6 (page 128)
- Critical Thinking and Writing, Chapter 6 (pages 128–29)

Assign the textbook reading for the next class.

- Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 1, "Theology and Evolution" (pages 131–51)
- Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 2, "The Science of Evolution" (pages 154–89)

Week 4

Lesson A: Can a Christian Accept the Theory of Evolution?

Note: This chapter is divided into two parts, one on the theology of evolution and one on the science of evolution. Decide whether to assign all of it or only one part, or whether to select certain sections with topics that are of interest to the students. If the whole chapter is assigned, give the students a warning that this week will be more demanding. The students can also read the extra material on their own after the short course ends.

Watch the following videos either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 1: Theology and Evolution (31 minutes) video link
- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 2: Science of Evolution (38 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (page 153 or pages 190–91) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

- Chapter 7, Part 1:

genomes	scientism	corporeal
monogenism	polygenism	deoxyribonucleic acid (DNA)

- Chapter 7, Part 2:

microevolution	macroevolution	natural selection
gene	genetic drift	speciation
traits	phenotype	genotype
fossil record	comparative anatomy	strata
bacteria	cyanobacteria	fission
eukaryotes	Cambrian period	Cambrian explosion
invertebrates	chordates	vascular plants
spores	angiosperms	geographical distribution

continental drift	genetics	nucleotides
amino acids	recombination	homologous
paleoanthropology	hominids	mitochondrial DNA
genetic bottleneck	cytoplasm	organelles
mitochondria	Y-chromosome	

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 7, Part 1 (page 152)
- Reading Comprehension, Chapter 7, Part 2 (pages 189–90)
- Critical Thinking and Writing, Chapter 7, Part 1 (page 153)
- Critical Thinking and Writing, Chapter 7, Part 2 (pages 190–91)

Assign the textbook reading for the next class.

- Chapter 8, "When Does a Human Life Begin?" (pages 193–204)
- Summary, "We Don't Need to Choose between Faith and Science" (pages 207–12)

Lesson B: When Does a Human Life Begin?

Watch the following video either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 8: When Does a Human Life Begin? (16 minutes) video link
- Conclusion: We Don't Need to Choose Between Faith and Science (9 minutes) video link

Choose three of the Critical Thinking and Writing questions (page 205) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

sperm	egg	gametes	zygote
gastrulation	blastula	monozygotic	blastomeres
brain waves	electroencephalograph (EEG)	conception	

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 8 (pages 204–5)
- Critical Thinking and Writing, Chapter 8 (page 205)

8-WEEK COURSE SCHEDULES

FIXED APPROACH

Course Preparation and Assessment Scale

Have the students obtain a notebook or composition book to record their assignments. If you are doing the class digitally, have the students make a Word or Google document to record their assignments. The students should organize the work by week (1, 2, 3, 4, 5, 6, 7, 8). Each lesson will contain a vocabulary list and responses to Chapter Assessments. The lesson plans are organized for 50-minute class periods, two classes per week. *Note*: This approach does *not* require students to read Chapter 7, Part 2: "The Science of Evolution." Students are only responsible for reading Chapter 7, Part 1: "Theology and Evolution."

Grade the work each week, either by taking up the notebooks or the sheets of paper or by accessing the digital file. The vocabulary definitions are listed in the book. Rather than have the students rewrite each definition, have them memorize the definitions. Then quiz them on one or two sample terms to gauge understanding. Or have them write some or all of the terms in sentences.

Grade the Chapter Assessments as follows:

- 15 points for each correct Reading Comprehension response
- 25 points for each correct Critical Thinking and Writing response.

The responses should be full sentences. Answers are included at www.avemariapress.com/resources.

For the overall course grade, weight the vocabulary scores 10 percent and the Chapter Assessment scores 80 percent. For the 8-week course, a final writing assignment, the course paper, is recommended for 10 percent of the course grade. The course paper is graded based on the instructions and grading rubrics supplied below. Alternatively, the final exam can be given. For other ideas, refer to the Modified and Customizable teaching approaches.

Course Paper

The course paper addresses this prompt: "What does it mean to say that science is the study of the handiwork of God?" The paper should (1) answer the question in general terms, (2) support the answer giving three examples from science, and (3) support the answer using at least three magisterial documents (papal encyclicals, councils, the *Catechism of the Catholic Church*, etc.). The length is between 1,500 and 2,000 words. The format is Times New Roman font, size 12, double-spaced. References should be cited as endnotes using a standard format such as the Chicago Manual of Style (CMOS) or Modern Language Association (MLA). The paper should be graded for 100 points according to the following rubrics for content and expression.

CONTENT (50 points)				
1–10 No understanding	**11–20 Wrong understanding**	**21–30 Some understanding**	**31–40 Solid understanding**	**41–50 Insightful understanding**
Answer shows no knowledge of the concepts addressed in the question or topic.	Answer shows misunderstanding of the concepts addressed in the question through an inability to explain them.	Answer shows adequate understanding of the concepts addressed in the question.	Answer shows understanding of the concepts addressed in the question and uses that understanding effectively in an example.	Answer shows understanding of the concepts addressed in the question and uses that understanding in an example that makes a connection to other concepts.

WRITING AND EXPRESSION (50 points)				
1–10 Incomplete, fails to address topic	**11–20 Unclear, poorly organized**	**21–30 Acceptable, needs sharpening**	**31–40 Solid, interesting perspective**	**41–50 Command, makes clear impression**
Writing does not address the topic at all, is confused, insufficient, and unacceptable.	Writing barely addresses the topic, goes off topic, is poorly developed with little elaboration; errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing unevenly addresses the topic, is satisfactorily organized, could use more vigor; errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing adequately addresses the topic, is persuasively organized, uses reasons and examples; few errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing thoroughly addresses the topic and is concise, cogent, and insightful; superior syntax and diction; error-free grammar, mechanics, and usage.

Week 1

Share the first reading assignment via a welcome letter or class syllabus so the students can have it read before they come to class:

- Introduction: Welcome to a Course on Faith and Science! (pages xi–xv)
- Unit I, "Science in the Light of Faith" (page 1)
- Chapter 1, "The Navigation Process" (pages 3–24)

Review procedures for completing assignments and criteria for course paper. (10 minutes)

Watch the following videos in class.

- Introduction: Welcome to a Course on Faith and Science! (15 minutes) video link
- Chapter 1: The Navigation Process (18 minutes) video link

Discuss Critical Thinking and Writing (page 25), number 12. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

science	universe	evangelize	atom
dichotomy	supernature	provisional	Magisterium
dogma	divine revelation	physics	infallible
theologians	exegetes	quantum theory	system of wills
supreme law	physical realm	laws of nature	free will
intellect	angels	humans	rational souls
instinct	discursive	miracle	nature

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 1 (page 24), numbers 2, 3, 7, 8, 11
  - Critical Thinking and Writing, Chapter 1 (page 25), number 14
- Read the textbook.
  - Chapter 2, "What Does Christianity Contribute to Science?" (pages 27–39)
- Remind class about course paper due at the end of the 8-week period.

Week 2

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 2: What Does Christianity Contribute to Science? (30 minutes) video link

Discuss Critical Thinking and Writing (page 40), number 10. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

pantheistic	animistic	mythological	Taoism
first principles	personification	Hellenistic	creation *ex nihilo*
Maccabees	martyrdom	perfect year	celestial bodies
apologists	pagans	cosmology	

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 2 (page 40), numbers 1, 2, 3, 6, 7
  - Critical Thinking and Writing, Chapter 2 (page 40), number 11
- Read the textbook.
  - Unit II, "Questions in the Physical Sciences" (pages 43–44)
  - Chapter 3, "Does the Big Bang Prove God?" (pages 45–62)
- Remind class about course paper due at the end of the 8-week period.

Week 3

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 3: Does the Big Bang Prove God? (32 minutes) video link

Discuss Critical Thinking and Writing (page 63), number 9. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

general relativity	Big Bang theory	primordial	philosophical
metaphysical	religious	exponential	gravitational waves
cosmic inflation	interstellar dust	inductive proofs	deductive proofs
Borde-Guth-Vilenkin theorem	probative force	subatomic particles	

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 3 (pages 62–63), numbers 2, 3, 4, 6, 7
  - Critical Thinking and Writing, Chapter 3 (page 63), number 11
- Read the textbook.
  - Chapter 4, "How Should We Understand the World of Atoms?" (pages 65–87)
- Remind class about course paper due at the end of the 8-week period.

Week 4

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 4: How Should We Understand the World of Atoms? (31 minutes) video link

Discuss Critical Thinking and Writing (page 88), number 9. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

chemistry	volition	mole
classical mechanics	quantum mechanics	nucleus
neutrons	protons	electron
orbitals	electromagnetic force	compounds
mass	charge	electron configurations
Pauli exclusion principle	Hund's rule	Heisenberg's uncertainty principle
electromagnetic radiation	atomic spectra	atomic mass
wave-particle duality	interference pattern	photons
quantum	symmetry	dipole moment

gravity	nuclear force	radioactive decay
fermions	bosons	hadrons
leptons	antiparticles	mesons
quark model	quarks	neutrino
positron	antimatter	gluons
Higgs boson	grand unification theories	string theory
prescriptive laws	descriptive laws	

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 4 (page 87), numbers 1, 2, 3, 6, 8
  - Critical Thinking and Writing, Chapter 4 (page 88), number 15
- Read the textbook.
  - Chapter 5, "Does Quantum Mechanics Allow for Free Will?" (pages 89–107)
- Remind class about course paper due at the end of the 8-week period.

Week 5

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 5: Does Quantum Mechanics Allow for Free Will? (28 minutes) video link

Discuss Critical Thinking and Writing (page 108), number 17. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

determinism	anticausal interpretation	hidden variables	ontological
operational	absolute	ideal gas equation	person
abstractions	logic		

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 5 (page 107–8), numbers 1, 2, 3, 6, 12
  - Critical Thinking and Writing, Chapter 5 (page 108–9), number 19

- Read the textbook.
  - Unit III, "Questions in the Biological Sciences" (page 111)
  - Chapter 6, "Did We Evolve from Atoms?" (pages 113–127)
- Remind class about course paper due at the end of the 8-week period.

Week 6

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 6: Did We Evolve from Atoms? (28 minutes) video link

Discuss Critical Thinking and Writing (page 128), number 13. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

evolution	biology	clone	computational models
nebula	red giant	white dwarf	supernova explosion
glorified bodies	chemical evolution	spontaneous generation	biogenesis
abiogenesis	prebiotic	proteins	carbohydrates
nucleic acids	primordial soup	biological evolution	protocell
artificial life	potentialities		

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 6 (page 128), numbers 1, 3, 4, 7, 8
- Read the textbook.
  - Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 1, "Theology and Evolution" (pages 131–51)
- Remind class about course paper due at the end of the 8-week period.

Week 7

Note: This chapter is divided into two parts, one on the theology of evolution and one on the science of evolution. This lesson focuses solely on Part 1.

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 1: Theology and Evolution (31 minutes) video link

Discuss Critical Thinking and Writing (page 153), number 14. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

genomes	scientism	corporeal
monogenism	polygenism	deoxyribonucleic acid (DNA)

- Do the Chapter Assessments.
  - Reading Comprehension, Chapter 7, Part 1 (page 152), numbers 1, 2, 3, 7, 8
  - Critical Thinking and Writing, Chapter 7, Part 1 (page 153), number 16
- Read the textbook.
  - Chapter 8, "When Does a Human Life Begin?" (pages 193–204)
  - Summary, "We Don't Need to Choose between Faith and Science" (pages 207–12)
- Remind class about course paper due at the end of the 8-week period.

Week 8

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following videos.

- Chapter 8: When Does a Human Life Begin? (16 minutes) video link
- Conclusion: We Don't Need to Choose Between Faith and Science (9 minutes) video link

Discuss Critical Thinking and Writing (page 205), number 7. (5 minutes)

Give the last assignments. (5 minutes)

- Learn the definitions of these words.

sperm	egg	gametes
zygote	gastrulation	blastula
monozygotic	blastomeres	brain waves
electroencephalograph (EEG)	conception	

- Do the Chapter Assessments.
  - Reading Comprehension, Chapter 8 (pages 204–5), numbers 2, 3, 4, 5, 6
  - Critical Thinking and Writing, Chapter 8 (page 205), number 8
- Course paper is due.

MODIFIED APPROACH

Course Preparation and Assessment Scale

Have the students obtain a notebook or composition book to record their assignments. If you are doing the class digitally, have the students make a Word or Google document to record their assignments. The students should organize the work by week (1, 2, 3, 4, 5, 6, 7, 8). Each lesson will contain a vocabulary list and responses to Chapter Assessments. *Note*: This approach provides the option for students to read all of Chapter 7, either Part 1 or Part 2, or selections from both parts, based upon your discretion.

Grade the work each week, either by taking up the notebooks or the sheets of paper or by accessing the digital file. The vocabulary definitions are listed in the book. Rather than have the students rewrite each definition, have them memorize the definitions. Then quiz them on one or two sample terms to gauge understanding. Or have them write some or all of the terms in sentences.

Grade the Chapter Assessments as follows:

- 15 points for each correct Reading Comprehension response
- 25 points for each correct Critical Thinking and Writing response.

The responses should be full sentences. Answers are included at www.avemariapress.com/resources.

For the overall course grade, weight the vocabulary scores 10 percent and the Chapter Assessment scores 80 percent. For the 8-week course, a final writing assignment, the course paper, is recommended for 10 percent of the course grade. The course paper is graded based on the instructions and grading rubrics supplied below. For other ideas, refer to the Fixed and Customizable teaching approaches.

Course Paper

The course paper addresses this prompt: "What does it mean to say that science is the study of the handiwork of God?" The paper should (1) answer the question in general terms, (2) support the answer giving three examples from science, and (3) support the answer using at least three magisterial documents (papal encyclicals, councils, the *Catechism of the Catholic Church*, etc.). The length is between 1,500 and 2,000 words. The format is Times New Roman font, size 12, double-spaced. References should be cited as endnotes using a standard format such as the Chicago Manual of Style (CMOS) or Modern Language Association (MLA). The paper should be graded for 100 points according to the following rubrics for content and expression.

CONTENT (50 points)				
1–10 No understanding	**11–20 Wrong understanding**	**21–30 Some understanding**	**31–40 Solid understanding**	**41–50 Insightful understanding**
Answer shows no knowledge of the concepts addressed in the question or topic.	Answer shows misunderstanding of the concepts addressed in the question through an inability to explain them.	Answer shows adequate understanding of the concepts addressed in the question.	Answer shows understanding of the concepts addressed in the question and uses that understanding effectively in an example.	Answer shows understanding of the concepts addressed in the question and uses that understanding in an example that makes a connection to other concepts.

WRITING AND EXPRESSION (50 points)				
1–10 Incomplete, fails to address topic	**11–20 Unclear, poorly organized**	**21–30 Acceptable, needs sharpening**	**31–40 Solid, interesting perspective**	**41–50 Command, makes clear impression**
Writing does not address the topic at all, is confused, insufficient, and unacceptable.	Writing barely addresses the topic, goes off topic, is poorly developed with little elaboration; errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing unevenly addresses the topic, is satisfactorily organized, could use more vigor; errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing adequately addresses the topic, is persuasively organized, uses reasons and examples; few errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing thoroughly addresses the topic and is concise, cogent, and insightful; superior syntax and diction; error-free grammar, mechanics, and usage.

Week 1

Share the first reading assignment via a welcome letter or class syllabus so the students can have it read before they come to class:

- Introduction: Welcome to a Course on Faith and Science! (pages xi–xv)
- Unit I, "Science in the Light of Faith" (page 1)
- Chapter 1, "The Navigation Process" (pages 3–24)

Review procedures for completing assignments. (10 minutes)

Watch the following videos either in class or as an assignment outside of class.

- Introduction: Welcome to a Course on Faith and Science! (15 minutes) video link
- Chapter 1: The Navigation Process (18 minutes) video link

Choose two to four of the Critical Thinking and Writing questions (page 25) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

science	universe	evangelize	atom
dichotomy	supernature	provisional	Magisterium
dogma	divine revelation	physics	infallible
theologians	exegetes	quantum theory	system of wills
supreme law	physical realm	laws of nature	free will
intellect	angels	humans	rational souls
instinct	discursive	miracle	nature

- Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.
    - Reading Comprehension, Chapter 1 (page 24), choose any five questions
    - Critical Thinking and Writing, Chapter 1 (page 25), choose any question
- Assign the textbook reading for the next class.
    - Chapter 2, "What Does Christianity Contribute to Science?" (pages 27–39)

Week 2

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch the following video either in class or as an assignment outside of class.

- Chapter 2: What Does Christianity Contribute to Science? (30 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (pages 40–41) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

pantheistic	animistic	mythological
Taoism	first principles	personification
Hellenistic	creation *ex nihilo*	Maccabees
martyrdom	perfect year	celestial bodies
apologists	pagans	cosmology

- Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.
  - Reading Comprehension, Chapter 2 (page 40), choose any five questions
  - Critical Thinking and Writing, Chapter 2 (pages 40–41), choose any question
- Assign the textbook reading for the next class.
  - Unit II, "Questions in the Physical Sciences" (pages 43–44)
  - Chapter 3, "Does the Big Bang Prove God?" (pages 45–62)

Week 3

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch the following video either in class or as an assignment outside of class.

- Chapter 3: Does the Big Bang Prove God? (32 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (page 63) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

general relativity	Big Bang theory	primordial
philosophical	metaphysical	religious
exponential	gravitational waves	cosmic inflation

interstellar dust	inductive proofs	deductive proofs
Borde-Guth-Vilenkin theorem	probative force	subatomic particles

- Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.
  - Reading Comprehension, Chapter 3 (pages 62–63), choose any five questions
  - Critical Thinking and Writing, Chapter 3 (page 63), choose any question
- Assign the textbook reading for the next class.
  - Chapter 4, "How Should We Understand the World of Atoms?" (pages 65–87)

Week 4

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch the following video either in class or as an assignment outside of class.

- Chapter 4: How Should We Understand the World of Atoms? (31 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (page 88) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

chemistry	volition	mole
classical mechanics	quantum mechanics	nucleus
neutrons	protons	electron
orbitals	electromagnetic force	compounds
mass	charge	electron configurations
Pauli exclusion principle	Hund's rule	Heisenberg's uncertainty principle
electromagnetic radiation	atomic spectra	atomic mass
wave-particle duality	interference pattern	photons
quantum	symmetry	dipole moment
gravity	nuclear force	radioactive decay
fermions	bosons	hadrons
leptons	antiparticles	mesons

quark model	quarks	neutrino
positron	antimatter	gluons
Higgs boson	grand unification theories	string theory
prescriptive laws	descriptive laws	

- Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.
  - Reading Comprehension, Chapter 4 (page 87), choose any five questions
  - Critical Thinking and Writing, Chapter 4 (page 88), choose any question
- Assign the textbook reading for the next class.
  - Chapter 5, "Does Quantum Mechanics Allow for Free Will?" (pages 89–107)

Week 5

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch the following video either in class or as an assignment outside of class.

- Chapter 5: Does Quantum Mechanics Allow for Free Will? (28 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (pages 108–9) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

determinism	anticausal interpretation	hidden variables
ontological	operational	absolute
ideal gas equation	person	abstractions
logic		

- Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.
  - Reading Comprehension, Chapter 5 (pages 107–8), choose any five questions
  - Critical Thinking and Writing, Chapter 5 (page 108–9), choose any question
- Assign the textbook reading for the next class.
  - Unit III, "Questions in the Biological Sciences" (page 111)
  - Chapter 6, "Did We Evolve from Atoms?" (pages 113–127)

Week 6

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch the following video either in class or as an assignment outside of class.

- Chapter 6: Did We Evolve from Atoms? (28 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (pages 128–129) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

evolution	biology	clone	computational models
nebula	red giant	white dwarf	supernova explosion
glorified bodies	chemical evolution	spontaneous generation	biogenesis
abiogenesis	prebiotic	proteins	carbohydrates
nucleic acids	primordial soup	biological evolution	protocell
artificial life	potentialities		

- Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.
    - Reading Comprehension, Chapter 6 (page 128), choose any five questions
    - Critical Thinking and Writing, Chapter 6 (pages 128–29), choose any question
- Assign the textbook reading for the next class.
    - Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 1, "Theology and Evolution" (pages 131–51)
    - Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 2, "The Science of Evolution" (pages 154–89)

Week 7

Note: This chapter is divided into two parts, one on the theology of evolution and one on the science of evolution. Decide whether to assign all of it or only one part, or whether to select certain sections with topics that are of interest to the students. If the whole chapter is assigned, give the students a warning that this week will be more demanding. The students can also read the extra material on their own after the short course ends.

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch either one or both of the following videos either in class or as an assignment outside of class.

- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 1: Theology and Evolution (31 minutes) video link
- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 2: Science of Evolution (38 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (page 153 or pages 190–91) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.
  - Chapter 7, Part 1:

genomes	scientism	corporeal
monogenism	polygenism	deoxyribonucleic acid (DNA)

  - Chapter 7, Part 2:

microevolution	macroevolution	natural selection
gene	genetic drift	speciation
traits	phenotype	genotype
fossil record	comparative anatomy	strata
bacteria	cyanobacteria	fission
eukaryotes	Cambrian period	Cambrian explosion
invertebrates	chordates	vascular plants
spores	angiosperms	geographical distribution
continental drift	genetics	nucleotides
amino acids	recombination	homologous
paleoanthropology	hominids	mitochondrial DNA
genetic bottleneck	cytoplasm	organelles
mitochondria	Y-chromosome	

- Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.
  - Reading Comprehension, Chapter 7, Part 1 (page 152), choose any five questions
  - Reading Comprehension, Chapter 7, Part 2 (pages 189–90), choose any five questions
  - Critical Thinking and Writing, Chapter 7, Part 1 (page 153), choose any question
  - Critical Thinking and Writing, Chapter 7, Part 2 (pages 190–91), choose any question

- Assign the textbook reading for the next class.
  - Chapter 8, "When Does a Human Life Begin?" (pages 193–204)
  - Summary, "We Don't Need to Choose between Faith and Science" (pages 207–12)

Week 8

Review the previous lesson, perhaps with a discussion of any questions from the Chapter Assessment items that the students have already completed.

Watch the following videos either in class or as an assignment outside of class.

- Chapter 8: When Does a Human Life Begin? (16 minutes) video link
- Conclusion: We Don't Need to Choose Between Faith and Science (9 minutes) video link

Choose three of the Critical Thinking and Writing questions (page 205) and discuss either with the whole class or in small groups.

Here are some other suggested assignments.

- Learn these words by reviewing them either with an audio recording or with flashcards.

sperm	egg	gametes
zygote	gastrulation	blastula
monozygotic	blastomeres	brain waves
electroencephalograph (EEG)	conception	

- Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.
  - Reading Comprehension, Chapter 8 (pages 204–5), choose any five questions
  - Critical Thinking and Writing, Chapter 8 (page 205), choose any question
- Course paper is due.

CUSTOMIZABLE APPROACH

Course Preparation and Assessment Scale

Have the students obtain a notebook or composition book to record their assignments. If you are doing the class digitally, have the students make a Word or Google document to record their assignments. The students should organize the work by week (1, 2, 3, 4, 5, 6, 7, 8). Each lesson will contain a vocabulary list and responses to Chapter Assessments. *Note*: This approach requires students to read Chapter 7, Part 1: "Theology and Evolution" *and* Part 2: "The Science of Evolution."

Grade the work each week, either by taking up the notebooks or the sheets of paper or by accessing the digital file. The vocabulary definitions are listed in the book. Rather than have the students

rewrite each definition, have them memorize the definitions. Then quiz them on one or two sample terms to gauge understanding. Or have them write some or all of the terms in sentences.

Grade the Chapter Assessments as follows:

- 15 points for each correct Reading Comprehension response
- 25 points for each correct Critical Thinking and Writing response.

The responses should be full sentences. Answers are included at www.avemariapress.com/resources.

For the overall course grade, weight the vocabulary scores 10 percent and the Chapter Assessment scores 80 percent. For the 8-week course, a final writing assignment, the course paper, is recommended for 10 percent of the course grade. The course paper is graded based on the instructions and grading rubrics supplied below. For other ideas, refer to the Fixed and Modified teaching approaches.

Course Paper

The course paper addresses this prompt: "What does it mean to say that science is the study of the handiwork of God?" The paper should (1) answer the question in general terms, (2) support the answer giving three examples from science, and (3) support the answer using at least three magisterial documents (papal encyclicals, councils, the *Catechism of the Catholic Church*, etc.). The length is between 1,500 and 2,000 words. The format is Times New Roman font, size 12, double-spaced. References should be cited as endnotes using a standard format such as the Chicago Manual of Style (CMOS) or Modern Language Association (MLA). The paper should be graded for 100 points according to the following rubrics for content and expression.

CONTENT (50 points)				
1–10 No understanding	**11–20 Wrong understanding**	**21–30 Some understanding**	**31–40 Solid understanding**	**41–50 Insightful understanding**
Answer shows no knowledge of the concepts addressed in the question or topic.	Answer shows misunderstanding of the concepts addressed in the question through an inability to explain them.	Answer shows adequate understanding of the concepts addressed in the question.	Answer shows understanding of the concepts addressed in the question and uses that understanding effectively in an example.	Answer shows understanding of the concepts addressed in the question and uses that understanding in an example that makes a connection to other concepts.

WRITING AND EXPRESSION (50 points)				
1–10 Incomplete, fails to address topic	**11–20 Unclear, poorly organized**	**21–30 Acceptable, needs sharpening**	**31–40 Solid, interesting perspective**	**41–50 Command, makes clear impression**
Writing does not address the topic at all, is confused, insufficient, and unacceptable.	Writing barely addresses the topic, goes off topic, is poorly developed with little elaboration; errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing unevenly addresses the topic, is satisfactorily organized, could use more vigor; errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing adequately addresses the topic, is persuasively organized, uses reasons and examples; few errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing thoroughly addresses the topic and is concise, cogent, and insightful; superior syntax and diction; error-free grammar, mechanics, and usage.

Week 1

Share the first reading assignment via a welcome letter or class syllabus so the students can have it read before they come to class:

- Introduction: Welcome to a Course on Faith and Science! (pages xi–xv)
- Unit I, "Science in the Light of Faith" (page 1)
- Chapter 1, "The Navigation Process" (pages 3–24)

Watch the following videos either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Introduction: Welcome to a Course on Faith and Science! (15 minutes) video link
- Chapter 1: The Navigation Process (18 minutes) video link

Choose two to four of the Critical Thinking and Writing questions (page 25) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

science	universe	evangelize	atom
dichotomy	supernature	provisional	Magisterium
dogma	divine revelation	physics	infallible
theologians	exegetes	quantum theory	system of wills
supreme law	physical realm	laws of nature	free will
intellect	angels	humans	rational souls
instinct	discursive	miracle	nature

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 1 (page 24)
- Critical Thinking and Writing, Chapter 1 (page 25)

Assign the textbook reading for the next class.

- Chapter 2, "What Does Christianity Contribute to Science?" (pages 27–39)

Week 2

Watch the following video either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 2: What Does Christianity Contribute to Science? (30 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (pages 40–41) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

pantheistic	animistic	mythological	Taoism
first principles	personification	Hellenistic	creation *ex nihilo*
Maccabees	martyrdom	perfect year	celestial bodies
apologists	pagans	cosmology	

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 2 (page 40)
- Critical Thinking and Writing, Chapter 2 (pages 40–41)

Assign the textbook reading for the next class.

- Unit II, "Questions in the Physical Sciences" (pages 43–44)
- Chapter 3, "Does the Big Bang Prove God?" (pages 45–62)

Week 3

Watch the following video either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 3: Does the Big Bang Prove God? (32 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (page 63) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

general relativity	Big Bang theory	primordial	philosophical
metaphysical	religious	exponential	gravitational waves
cosmic inflation	interstellar dust	inductive proofs	deductive proofs
Borde-Guth-Vilenkin theorem	probative force	subatomic particles	

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 3 (pages 62–63)
- Critical Thinking and Writing, Chapter 3 (page 63)

Assign the textbook reading for the next class.

- Chapter 4, "How Should We Understand the World of Atoms?" (pages 65–87)

Week 4

Watch the following video either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 4: How Should We Understand the World of Atoms? (31 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (page 88) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

chemistry	volition	mole
classical mechanics	quantum mechanics	nucleus
neutrons	protons	electron

orbitals	electromagnetic force	compounds
mass	charge	electron configurations
Pauli exclusion principle	Hund's rule	Heisenberg's uncertainty principle
electromagnetic radiation	atomic spectra	atomic mass
wave-particle duality	interference pattern	photons
quantum	symmetry	dipole moment
gravity	nuclear force	radioactive decay
fermions	bosons	hadrons
leptons	antiparticles	mesons
quark model	quarks	neutrino
positron	antimatter	gluons
Higgs boson	grand unification theories	string theory
prescriptive laws	descriptive laws	

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 4 (page 87)
- Critical Thinking and Writing, Chapter 4 (page 88)

Assign the textbook reading for the next class.

- Chapter 5, "Does Quantum Mechanics Allow for Free Will?" (pages 89–107)

Week 5

Watch the following video either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 5: Does Quantum Mechanics Allow for Free Will? (28 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (pages 108–9) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

determinism	anticausal interpretation	hidden variables	ontological
operational	absolute	ideal gas equation	person
abstractions	logic		

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 5 (pages 107–8)
- Critical Thinking and Writing, Chapter 5 (pages 108–9)

Assign the textbook reading for the next class.

- Unit III, "Questions in the Biological Sciences" (page 111)
- Chapter 6, "Did We Evolve from Atoms?" (pages 113–127)

Week 6

Watch the following video either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 6: Did We Evolve from Atoms? (28 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (pages 128–29) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

Evolution	biology	clone
computational models	nebula	red giant
white dwarf	supernova explosion	glorified bodies
chemical evolution	spontaneous generation	biogenesis
abiogenesis	prebiotic	proteins
carbohydrates	nucleic acids	primordial soup
biological evolution	protocell	artificial life
potentialities		

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 6 (page 128)
- Critical Thinking and Writing, Chapter 6 (pages 128–29)

Assign the textbook reading for the next class.

- Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 1, "Theology and Evolution" (pages 131–51)
- Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 2, "The Science of Evolution" (pages 154–89)

Week 7

Note: This chapter is divided into two parts, one on the theology of evolution and one on the science of evolution. Decide whether to assign all of it or only one part, or whether to select certain sections with topics that are of interest to the students. If the whole chapter is assigned, give the students a warning that this week will be more demanding. The students can also read the extra material on their own after the short course ends.

Watch the following videos either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 1: Theology and Evolution (31 minutes) video link
- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 2: Science of Evolution (38 minutes) video link

Choose three to five of the Critical Thinking and Writing questions (page 153 or pages 190–91) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

- Chapter 7, Part 1:

genomes	scientism	corporeal
monogenism	polygenism	deoxyribonucleic acid (DNA)

- Chapter 7, Part 2:

microevolution	macroevolution	natural selection
gene	genetic drift	speciation
traits	phenotype	genotype
fossil record	comparative anatomy	strata
bacteria	cyanobacteria	fission
eukaryotes	Cambrian period	Cambrian explosion
invertebrates	chordates	vascular plants
spores	angiosperms	geographical distribution
continental drift	genetics	nucleotides
amino acids	recombination	homologous
paleoanthropology	hominids	mitochondrial DNA
genetic bottleneck	cytoplasm	organelles
mitochondria	Y-chromosome	

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 7, Part 1 (page 152)
- Reading Comprehension, Chapter 7, Part 2 (pages 189–90)
- Critical Thinking and Writing, Chapter 7, Part 1 (page 153)
- Critical Thinking and Writing, Chapter 7, Part 2 (pages 190–91)

Assign the textbook reading for the next class.

- Chapter 8, "When Does a Human Life Begin?" (pages 193–204)
- Summary, "We Don't Need to Choose between Faith and Science" (pages 207–12)

Week 8

Watch the following videos either in class or as an assignment outside of class. Or prepare your own presentation, using these videos for study, using additional materials, or inviting guest lecturers.

- Chapter 8: When Does a Human Life Begin? (16 minutes) video link
- Conclusion: We Don't Need to Choose Between Faith and Science (9 minutes) video link

Choose three of the Critical Thinking and Writing questions (page 205) and discuss either with the whole class or in small groups.

Incorporate these vocabulary words into a lecture or presentation.

sperm	egg	gametes	zygote
gastrulation	blastula	monozygotic	blastomeres
brain waves	electroencephalograph (EEG)	conception	

Assign students to work on the Chapter Assessment either individually or by dividing up the questions with a partner.

- Reading Comprehension, Chapter 8 (pages 204–5)
- Critical Thinking and Writing, Chapter 8 (page 205)

Course paper is due.

16-WEEK COURSE

FIXED APPROACH

Course Preparation and Assessment Scale

Have the students obtain a notebook or composition book to record their assignments. If you are doing the class digitally, have the students make a Word or Google document to record their assignments. The students should organize the work by week (1–16). Each lesson will contain a vocabulary list, responses to Chapter Assessments, and a quiz. The lesson plans are organized for 50-minute class periods, two classes per week.

Grade the work each week, either by taking up the notebooks or the sheets of paper or by accessing the digital file. The vocabulary definitions are listed in the book. Rather than have the students rewrite each definition, have them memorize the definitions. Then quiz them on one or two sample terms to gauge understanding. Or have them write some or all of the terms in sentences.

Grade the Chapter Assessments as follows:

- 15 points for each correct Reading Comprehension response
- 25 points for each correct Critical Thinking and Writing response.

The responses should be full sentences. Quizzes are provided for each chapter as well.

A midterm exam and a final exam are built into the course plan and provided to use as desired. Answers for Chapter Assessments, quizzes, and exams are included at www.avemariapress.com/resources.

For the course grade, the vocabulary or quiz average should count 10 percent, the Chapter Assessment average should count 60 percent, the exam average should count 20 percent, and the course paper should count 10 percent. For the 16-week course, both exams and a course paper are recommended. For other ideas, refer to the Modified and Customizable teaching approaches.

Course Paper

The course paper addresses this prompt: "What does it mean to say that science is the study of the handiwork of God?" The paper should (1) answer the question in general terms, (2) support the answer giving three examples from science, and (3) support the answer using at least three magisterial documents (papal encyclicals, councils, the *Catechism of the Catholic Church*, etc.). The length is between 1,500 and 2,000 words. The format is Times New Roman font, size 12, double-spaced. References should be cited as endnotes using a standard format such as the Chicago Manual of Style (CMOS) or Modern Language Association (MLA). The paper should be graded for 100 points according to the following rubrics for content and expression.

CONTENT (50 points)				
1–10 No understanding	**11–20 Wrong understanding**	**21–30 Some understanding**	**31–40 Solid understanding**	**41–50 Insightful understanding**
Answer shows no knowledge of the concepts addressed in the question or topic.	Answer shows misunderstanding of the concepts addressed in the question through an inability to explain them.	Answer shows adequate understanding of the concepts addressed in the question.	Answer shows understanding of the concepts addressed in the question and uses that understanding effectively in an example.	Answer shows understanding of the concepts addressed in the question and uses that understanding in an example that makes a connection to other concepts.

WRITING AND EXPRESSION (50 points)				
1–10 Incomplete, fails to address topic	**11–20 Unclear, poorly organized**	**21–30 Acceptable, needs sharpening**	**31–40 Solid, interesting perspective**	**41–50 Command, makes clear impression**
Writing does not address the topic at all, is confused, insufficient, and unacceptable.	Writing barely addresses the topic, goes off topic, is poorly developed with little elaboration; errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing unevenly addresses the topic, is satisfactorily organized, could use more vigor; errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing adequately addresses the topic, is persuasively organized, uses reasons and examples; few errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing thoroughly addresses the topic and is concise, cogent, and insightful; superior syntax and diction; error-free grammar, mechanics, and usage.

Week 1

Welcome to a Course on Faith and Science!

Share the first reading assignment via a welcome letter or class syllabus so the students can have it read before they come to class:

- Introduction: Welcome to a Course on Faith and Science! (pages xi–xv)

Welcome students to class! (5 minutes)

Review procedures for completing vocabulary, quizzes, and Chapter Assessment assignments, taking exams, and writing the course paper, including reviewing the grading rubrics and the composition of the final course grade. (15 minutes)

Watch the following video.

- Introduction: Welcome to a Course on Faith and Science! (15 minutes) video link

Discuss what it means to say that "science is the study of the handiwork of God." (10 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Read the textbook.
  - Unit I, "Science in the Light of Faith" (page 1)
  - Chapter 1, "The Navigation Process" (pages 3–24)

Week 2

The Navigation Process

Review once more the procedures for completing assignments. (10 minutes)

Watch the following video.

- Chapter 1: The Navigation Process (18 minutes) video link

Choose three of the Critical Thinking and Writing questions (page 25) to discuss in class to give students an example of the kind of answers you are looking for in the assignments. (20 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

science	universe	evangelize	atom
dichotomy	supernature	provisional	Magisterium
dogma	divine revelation	physics	infallible
theologians	exegetes	quantum theory	system of wills

supreme law	physical realm	laws of nature	free will
intellect	angels	humans	rational souls
instinct	discursive	miracle	nature

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 1 (page 24)
  - Critical Thinking and Writing, Chapter 1 (page 25)
- Read the textbook.
  - Chapter 2, "What Does Christianity Contribute to Science?" (pages 27–39)

Week 3

What Does Christianity Contribute to Science?

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 2: What Does Christianity Contribute to Science? (30 minutes) video link

Choose one Critical Thinking and Writing question (pages 40–41) to discuss in class. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

pantheistic	animistic	mythological	Taoism
first principles	personification	Hellenistic	creation *ex nihilo*
Maccabees	martyrdom	perfect year	celestial bodies
apologists	pagans	cosmology	

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 2 (page 40)
  - Critical Thinking and Writing, Chapter 2 (pages 40–41)
- Read the textbook.
  - Unit II, "Questions in the Physical Sciences" (pages 43–44)
  - Chapter 3, "Does the Big Bang Prove God?" (pages 45–62)

Week 4

Does the Big Bang Prove God?

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 3: Does the Big Bang Prove God? (32 minutes) video link

Choose one Critical Thinking and Writing question (page 63) to discuss in class. (5 minutes)

Give the following assignments for the students to do before the next class after the exam. (5 minutes)

- Learn the definitions of these words.

general relativity	Big Bang theory	primordial
philosophical	metaphysical	religious
exponential	gravitational waves	cosmic inflation
interstellar dust	inductive proofs	deductive proofs
Borde-Guth-Vilenkin theorem	probative force	subatomic particles

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 3 (pages 62–63)
  - Critical Thinking and Writing, Chapter 3 (page 63)
- Read the textbook.
  - Chapter 4, "How Should We Understand the World of Atoms?" (pages 65–87)

Week 5

Administer and grade Exam 1.

Week 6

How Should We Understand the World of Atoms?

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 4: How Should We Understand the World of Atoms? (31 minutes) video link

Choose one Critical Thinking and Writing question (page 88) to discuss in class. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

chemistry	volition	mole
classical mechanics	quantum mechanics	nucleus
neutrons	protons	electron
orbitals	electromagnetic force	compounds
mass	charge	electron configurations
Pauli exclusion principle	Hund's rule	Heisenberg's uncertainty principle
electromagnetic radiation	atomic spectra	atomic mass
wave-particle duality	interference pattern	photons
quantum	symmetry	dipole moment
gravity	nuclear force	radioactive decay
fermions	bosons	hadrons
leptons	antiparticles	mesons
quark model	quarks	neutrino
positron	antimatter	gluons
Higgs boson	grand unification theories	string theory
prescriptive laws	descriptive laws	

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 4 (page 87)
  - Critical Thinking and Writing, Chapter 4 (page 88)
- Read the textbook.
  - Chapter 5, "Does Quantum Mechanics Allow for Free Will?" (pages 89–107)

Week 7

Does Quantum Mechanics Allow for Free Will?

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 5: Does Quantum Mechanics Allow for Free Will? (28 minutes) video link

Choose one Critical Thinking and Writing question (page 108–9) to discuss in class. (5 minutes)

Give the following assignments for the students to do before the next class after the exam. (5 minutes)

- Learn the definitions of these words.

determinism	anticausal interpretation	hidden variables
ontological	operational	absolute
ideal gas equation	person	abstractions
logic		

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 5 (page 107–8)
  - Critical Thinking and Writing, Chapter 5 (pages 108–9)
- Read the textbook.
  - Unit III, "Questions in the Biological Sciences" (page 111)
  - Chapter 6, "Did We Evolve from Atoms?" (pages 113–27)

Week 8

Administer and grade Midterm Exam.

Week 9

Did We Evolve from Atoms?

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 6: Did We Evolve from Atoms? (28 minutes) video link

Choose one Critical Thinking and Writing question (page 129) to discuss in class. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

evolution	biology	clone
computational models	nebula	red giant
white dwarf	supernova explosion	glorified bodies
chemical evolution	spontaneous generation	biogenesis
abiogenesis	prebiotic	proteins
carbohydrates	nucleic acids	primordial soup
biological evolution	protocell	artificial life
potentialities		

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 6 (page 128)
  - Critical Thinking and Writing, Chapter 6 (pages 128–29)
- Read the textbook.
  - Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 1, "Theology and Evolution" (pages 131–51)

Week 10

Can a Christian Accept the Theory of Evolution? Theology and Evolution

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 1: Theology and Evolution (31 minutes) video link

Choose one Critical Thinking and Writing question (page 153) to discuss in class. (5 minutes)

Give the following assignments for the students to do before the next class after the exam. (5 minutes)

- Learn the definitions of these words.

genomes	scientism	corporeal
monogenism	polygenism	deoxyribonucleic acid (DNA)

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 7, Part 1 (page 152)
  - Critical Thinking and Writing, Chapter 7, Part 1 (page 153)
- Read the textbook.
  - Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 2, "Science of Evolution" (pages 154–89)

Week 11

Administer and grade Exam 3.

Week 12

Can a Christian Accept the Theory of Evolution? Science of Evolution

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 2: Science of Evolution (38 minutes) video link

Choose one Critical Thinking and Writing question (pages 190–91) to discuss in class. (5 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

microevolution	macroevolution	natural selection
gene	genetic drift	speciation
traits	phenotype	genotype
fossil record	comparative anatomy	strata
bacteria	cyanobacteria	fission
eukaryotes	Cambrian period	Cambrian explosion
invertebrates	chordates	vascular plants
spores	angiosperms	geographical distribution
continental drift	genetics	nucleotides
amino acids	recombination	homologous
paleoanthropology	hominids	mitochondrial DNA
genetic bottleneck	cytoplasm	organelles
mitochondria	Y-chromosome	

- Do the Chapter Assessment.
    - Reading Comprehension, Chapter 7, Part 2 (pages 189–90)
    - Critical Thinking and Writing, Chapter 7, Part 2 (pages 190–91)
- Read the textbook.
    - Chapter 8, "When Does a Human Life Begin?" (pages 193–204)

Week 13

When Does a Human Life Begin?

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Chapter 8: When Does a Human Life Begin? (16 minutes) video link

Choose one Critical Thinking and Writing question (page 205) to discuss in class. (5 minutes)

Give the following assignments for the students to do before the next class after the exam. (5 minutes)

- Learn the definitions of these words.

sperm	egg	gametes
zygote	gastrulation	blastula
monozygotic	blastomeres	brain waves
electroencephalograph (EEG)	conception	

- Do the Chapter Assessments.
  - Reading Comprehension, Chapter 8 (pages 204–5)
  - Critical Thinking and Writing, Chapter 8 (page 205)
- Read the textbook.
  - Summary, "We Don't Need to Choose between Faith and Science" (pages 207–12)

Week 14

We Don't Need to Choose between Faith and Science

Discuss any questions from the Chapter Assessment items that the students have already completed. (10 minutes)

Watch the following video.

- Conclusion: We Don't Need to Choose Between Faith and Science (9 minutes) video link

Review instructions and grading rubrics for the course paper. (20 minutes)

Week 15

Administer and grade Final Exam.

Week 16

Course paper is due.

MODIFIED APPROACH

Course Preparation and Assessment Scale

Have the students obtain a notebook or composition book to record their assignments. If you are doing the class digitally, have the students make a Word or Google document to record their assignments. The students should organize the work by week (1–16). Each lesson will contain a vocabulary list, a quiz, and responses to Chapter Assessments.

Grade the work each week, either by taking up the notebooks or the sheets of paper or by accessing the digital file. For the course grade, the vocabulary or quiz average should count 10 percent, the Chapter Assessment average should count 60 percent, the exam average should count 20 percent, and the course paper should count 10 percent. Homework will consist of a reading assignment, a video assignment, and the Chapter Assessment, leaving more time in class for discussion. For the 16-week course, both exams and a course paper are recommended. For other ideas, refer to the Fixed and Customizable teaching approaches.

Course Paper

The course paper addresses this prompt: "What does it mean to say that science is the study of the handiwork of God?" The paper should (1) answer the question in general terms, (2) support the answer giving three examples from science, and (3) support the answer using at least three magisterial documents (papal encyclicals, councils, the *Catechism of the Catholic Church*, etc.). The length is between 1,500 and 2,000 words. The format is Times New Roman font, size 12, double-spaced. References should be cited as endnotes using a standard format such as the Chicago Manual of Style (CMOS) or Modern Language Association (MLA). The paper should be graded for 100 points according to the following rubrics for content and expression.

CONTENT (50 points)				
1–10 No understanding	**11–20 Wrong understanding**	**21–30 Some understanding**	**31–40 Solid understanding**	**41–50 Insightful understanding**
Answer shows no knowledge of the concepts addressed in the question or topic.	Answer shows misunderstanding of the concepts addressed in the question through an inability to explain them.	Answer shows adequate understanding of the concepts addressed in the question.	Answer shows understanding of the concepts addressed in the question and uses that understanding effectively in an example.	Answer shows understanding of the concepts addressed in the question and uses that understanding in an example that makes a connection to other concepts.

WRITING AND EXPRESSION (50 points)				
1–10 Incomplete, fails to address topic	**11–20 Unclear, poorly organized**	**21–30 Acceptable, needs sharpening**	**31–40 Solid, interesting perspective**	**41–50 Command, makes clear impression**
Writing does not address the topic at all, is confused, insufficient, and unacceptable.	Writing barely addresses the topic, goes off topic, is poorly developed with little elaboration; errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing unevenly addresses the topic, is satisfactorily organized, could use more vigor; errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing adequately addresses the topic, is persuasively organized, uses reasons and examples; few errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing thoroughly addresses the topic and is concise, cogent, and insightful; superior syntax and diction; error-free grammar, mechanics, and usage.

Week 1

Welcome to a Course on Faith and Science!

Share the first reading assignment via a welcome letter or class syllabus so the students can have it read before they come to class:

- Introduction: Welcome to a Course on Faith and Science! (pages xi–xv)

Welcome students to class! (10 minutes)

Review procedures for completing vocabulary, quizzes, and Chapter Assessment assignments, taking exams, and writing the course paper, including reviewing the grading rubrics and the composition of the final course grade. (15 minutes)

Watch the following video.

- Introduction: Welcome to a Course on Faith and Science! (15 minutes) video link

Discuss what it means to say that "science is the study of the handiwork of God." (10 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Read the textbook.
  - Unit I, "Science in the Light of Faith" (page 1)
  - Chapter 1, "How Do We Navigate Science in the Light of Faith?" (pages 3–24)
- Watch the following video.
  - Chapter 1: The Navigation Process (18 minutes) video link

Week 2

The Navigation Process

Review once more the procedures for completing assignments. (15 minutes)

Discuss the Critical Thinking and Writing questions (page 25) in class. (30 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

science	universe	evangelize	atom
dichotomy	supernature	provisional	Magisterium
dogma	divine revelation	physics	infallible
theologians	exegetes	quantum theory	system of wills
supreme law	physical realm	laws of nature	free will
intellect	angels	humans	rational souls
instinct	discursive	miracle	nature

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 1 (page 24)
  - Critical Thinking and Writing, Chapter 1 (page 25)
- Read the textbook.
  - Chapter 2, "What Does Christianity Contribute to Science?" (pages 27–39)
- Watch the following video.
  - Chapter 2: What Does Christianity Contribute to Science? (30 minutes) video link

Week 3

What Does Christianity Contribute to Science?

Discuss any questions from the Chapter Assessment items that the students have already completed. (15 minutes)

Discuss the Critical Thinking and Writing questions (pages 40–41) in class. (30 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

pantheistic	animistic	mythological
Taoism	first principles	personification
Hellenistic	creation *ex nihilo*	Maccabees
martyrdom	perfect year	celestial bodies
apologists	pagans	cosmology

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 2 (page 40)
  - Critical Thinking and Writing, Chapter 2 (page 40–41)
- Read the textbook.
  - Unit II, "Questions in the Physical Sciences" (pages 43–44)
  - Chapter 3, "Does the Big Bang Prove God?" (pages 45–62)
- Watch the following video.
  - Chapter 3: Does the Big Bang Prove God? (32 minutes) video link

Week 4

Does the Big Bang Prove God?

Discuss any questions from the Chapter Assessment items that the students have already completed. (15 minutes)

Discuss the Critical Thinking and Writing questions (page 63) in class. (30 minutes)

Give the following assignments for the students to do before the next class after the exam. (5 minutes)

- Learn the definitions of these words.

general relativity	Big Bang theory	primordial
philosophical	metaphysical	religious
exponential	gravitational waves	cosmic inflation
interstellar dust	inductive proofs	deductive proofs
Borde-Guth-Vilenkin theorem	probative force	subatomic particles

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 3 (pages 62–63)
  - Critical Thinking and Writing, Chapter 3 (page 63)
- Read the textbook.
  - Chapter 4, "How Should We Understand the World of Atoms?" (pages 65–87)
- Watch the following video.
  - Chapter 4: How Should We Understand the World of Atoms? (31 minutes) video link

Week 5

Administer and grade Exam 1.

Week 6

How Should We Understand the World of Atoms?

Discuss any questions from the Chapter Assessment items that the students have already completed. (15 minutes)

Discuss the Critical Thinking and Writing questions (page 88) in class. (30 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

chemistry	volition	mole
classical mechanics	quantum mechanics	nucleus
neutrons	protons	electron
orbitals	electromagnetic force	compounds
mass	charge	electron configurations
Pauli exclusion principle	Hund's rule	Heisenberg's uncertainty principle
electromagnetic radiation	atomic spectra	atomic mass
wave-particle duality	interference pattern	photons
quantum	symmetry	dipole moment
gravity	nuclear force	radioactive decay
fermions	bosons	hadrons
leptons	antiparticles	mesons
quark model	quarks	neutrino
positron	antimatter	gluons

Higgs boson	grand unification theories	string theory
prescriptive laws	descriptive laws	

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 4 (page 87)
  - Critical Thinking and Writing, Chapter 4 (page 88)
- Read the textbook.
  - Chapter 5, "Does Quantum Mechanics Allow for Free Will?" (pages 89–107)
- Watch the following video.
  - Chapter 5: Does Quantum Mechanics Allow for Free Will? (28 minutes) video link

Week 7

Does Quantum Mechanics Allow for Free Will?

Discuss any questions from the Chapter Assessment items that the students have already completed. (15 minutes)

Discuss the Critical Thinking and Writing questions (pages 108–9) in class. (30 minutes)

Give the following assignments for the students to do before the next class after the exam. (5 minutes)

- Learn the definitions of these words.

determinism	anticausal interpretation	hidden variables	
ontological	operational	absolute	
ideal gas equation	person	abstractions	logic

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 5 (pages 107–8)
  - Critical Thinking and Writing, Chapter 5 (pages 108–9)
- Read the textbook.
  - Unit III, "Questions in the Biological Sciences" (page 111)
  - Chapter 6, "Did We Evolve from Atoms?" (pages 113–27)
- Watch the following video.
  - Chapter 6: Did We Evolve from Atoms? (28 minutes) video link

Week 8

Administer and grade Midterm Exam.

Week 9

Did We Evolve from Atoms?

Discuss any questions from the Chapter Assessment items that the students have already completed. (15 minutes)

Discuss the Critical Thinking and Writing questions (pages 128–29) in class. (30 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

evolution	biology	clone
computational models	nebula	red giant
white dwarf	supernova explosion	glorified bodies
chemical evolution	spontaneous generation	biogenesis
abiogenesis	prebiotic	proteins
carbohydrates	nucleic acids	primordial soup
biological evolution	protocell	artificial life
potentialities		

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 6 (page 128)
  - Critical Thinking and Writing, Chapter 6 (pages 128–29)
- Read the textbook.
  - Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 1, "Theology and Evolution" (pages 131–51)
- Watch the following video.
  - Chapter 7: Can a Christian Accept the Theory of Evolution? Part 1: Theology and Evolution (31 minutes) video link

Week 10

Can a Christian Accept the Theory of Evolution? Theology and Evolution

Discuss any questions from the Chapter Assessment items that the students have already completed. (15 minutes)

Choose one Critical Thinking and Writing question (page 153) in class to discuss. (30 minutes)

Give the following assignments for the students to do before the next class after the exam. (5 minutes)

- Learn the definitions of these words.

genomes	scientism	corporeal
monogenism	polygenism	deoxyribonucleic acid (DNA)

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 7, Part 1 (page 152)
  - Critical Thinking and Writing, Chapter 7, Part 1 (page 153)
- Read the textbook.
  - Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 2, "Science of Evolution" (pages 154–89)
- Watch the following video.
  - Chapter 7: Can a Christian Accept the Theory of Evolution? Part 2: Science of Evolution (38 minutes) video link

Week 11

Administer and grade Exam 3.

Week 12

Can a Christian Accept the Theory of Evolution? Science of Evolution

Discuss any questions from the Chapter Assessment items that the students have already completed. (15 minutes)

Discuss the Critical Thinking and Writing questions (pages 190–91) in class. (30 minutes)

Give the following assignments for the students to do before the next class. (5 minutes)

- Learn the definitions of these words.

microevolution	macroevolution	natural selection
gene	genetic drift	speciation
traits	phenotype	genotype
fossil record	comparative anatomy	strata
bacteria	cyanobacteria	fission
eukaryotes	Cambrian period	Cambrian explosion
invertebrates	chordates	vascular plants
spores	angiosperms	geographical distribution
continental drift	genetics	nucleotides
amino acids	recombination	homologous

paleoanthropology	hominids	mitochondrial DNA
genetic bottleneck	cytoplasm	organelles
mitochondria	Y-chromosome	

- Do the Chapter Assessment.
  - Reading Comprehension, Chapter 7, Part 2 (pages 189–90)
  - Critical Thinking and Writing, Chapter 7, Part 2 (pages 190–91)
- Read the textbook.
  - Chapter 8, "When Does a Human Life Begin?" (pages 193–204)
- Watch the following video.
  - Chapter 8: When Does a Human Life Begin? (16 minutes) video link

Week 13

When Does a Human Life Begin?

Discuss any questions from the Chapter Assessment items that the students have already completed. (15 minutes)

Discuss the Critical Thinking and Writing questions (page 205) in class. (30 minutes)

Give the following assignments for the students to do before the next class after the exam. (5 minutes)

- Learn the definitions of these words.

sperm	egg	gametes	zygote
gastrulation	blastula	monozygotic	blastomeres
brain waves	electroencephalograph (EEG)	conception	

- Do the Chapter Assessments.
  - Reading Comprehension, Chapter 8 (pages 204–5)
  - Critical Thinking and Writing, Chapter 8 (page 205)
- Read the textbook.
  - Summary, "We Don't Need to Choose between Faith and Science" (pages 207–12)
- Watch the following video.
  - Conclusion: We Don't Need to Choose Between Faith and Science (9 minutes) video link

Week 14

We Don't Need to Choose between Faith and Science

Discuss any questions from the Chapter Assessment items that the students have already completed. (15 minutes)

Review instructions and grading rubrics for the course paper. (20 minutes)

Week 15

Administer and grade Final Exam.

Week 16

Course paper is due.

CUSTOMIZABLE APPROACH

Course Preparation and Assessment Scale

Have the students obtain a notebook or composition book to record their assignments. If you are doing the class digitally, have the students make a Word or Google document to record their assignments. The students should organize the work by week (1–16). Each lesson will contain a vocabulary list, a quiz, and responses to Chapter Assessments.

Grade the work each week, either by taking up the notebooks or the sheets of paper or by accessing the digital file. The course grade can be a compilation of vocabulary, notes on the videos, lecture notes, quizzes, Chapter Assessments (Reading Comprehension and Critical Thinking and Writing), exams, and the course paper. For the 16-week course, both exams and a course paper are recommended. For other ideas, refer to the Fixed and Modified teaching approaches.

The lessons can be constructed to use the videos in class with some discussion based on the Chapter Assessments. If more discussion is desired, the videos can be assigned for viewing outside of class, and the entire class can be devoted to a lecture and time on the Chapter Assessments. The course paper can be graded based on the instructions and grading rubrics supplied below.

Course Paper

The course paper addresses this prompt: "What does it mean to say that science is the study of the handiwork of God?" The paper should (1) answer the question in general terms, (2) support the answer giving three examples from science, and (3) support the answer using at least three magisterial documents (papal encyclicals, councils, the *Catechism of the Catholic Church*, etc.). The length is between 1,500 and 2,000 words. The format is Times New Roman font, size 12, double-spaced. References should be cited as endnotes using a standard format such as the Chicago Manual of Style (CMOS) or Modern Language Association (MLA). The paper should be graded for 100 points according to the following rubrics for content and expression.

CONTENT (50 points)				
1–10 No understanding	**11–20 Wrong understanding**	**21–30 Some understanding**	**31–40 Solid understanding**	**41–50 Insightful understanding**
Answer shows no knowledge of the concepts addressed in the question or topic.	Answer shows misunderstanding of the concepts addressed in the question through an inability to explain them.	Answer shows adequate understanding of the concepts addressed in the question.	Answer shows understanding of the concepts addressed in the question and uses that understanding effectively in an example.	Answer shows understanding of the concepts addressed in the question and uses that understanding in an example that makes a connection to other concepts.

WRITING AND EXPRESSION (50 points)				
1–10 Incomplete, fails to address topic	**11–20 Unclear, poorly organized**	**21–30 Acceptable, needs sharpening**	**31–40 Solid, interesting perspective**	**41–50 Command, makes clear impression**
Writing does not address the topic at all, is confused, insufficient, and unacceptable.	Writing barely addresses the topic, goes off topic, is poorly developed with little elaboration; errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing unevenly addresses the topic, is satisfactorily organized, could use more vigor; errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing adequately addresses the topic, is persuasively organized, uses reasons and examples; few errors in sentence structure, vocabulary, grammar, mechanics, and usage.	Writing thoroughly addresses the topic and is concise, cogent, and insightful; superior syntax and diction; error-free grammar, mechanics, and usage.

Week 1

Welcome to a Course on Faith and Science!

Read the textbook.

- "Introduction: Welcome to a Course on Faith and Science!" (pages xi–xv)

Watch the following video.

- Introduction: Welcome to a Course on Faith and Science! (15 minutes) video link

Review procedures for completing vocabulary, quizzes, and Chapter Assessment assignments, taking exams, and writing the course paper, including reviewing the grading rubrics and the composition of the final course grade.

Week 2

The Navigation Process

Read the textbook.

- Unit I, "Science in the Light of Faith" (page 1)
- Chapter 1, "The Navigation Process" (pages 3–24)

Watch the following video.

- Chapter 1: The Navigation Process (18 minutes) video link

Learn the definitions of these words.

science	universe	evangelize	atom
dichotomy	supernature	provisional	Magisterium
dogma	divine revelation	physics	infallible
theologians	exegetes	quantum theory	system of wills
supreme law	physical realm	laws of nature	free will
intellect	angels	humans	rational souls
instinct	discursive	miracle	nature

Do the Chapter Assessment.

- Reading Comprehension, Chapter 1 (page 24)
- Critical Thinking and Writing, Chapter 1 (page 25)

Week 3

What Does Christianity Contribute to Science?

Read the textbook.

- Chapter 2, "What Does Christianity Contribute to Science?" (pages 27–39)

Watch the following video.

- Chapter 2: What Does Christianity Contribute to Science? (30 minutes) video link

Learn the definitions of these words.

pantheistic	animistic	mythological	Taoism
first principles	personification	Hellenistic	creation *ex nihilo*
Maccabees	martyrdom	perfect year	celestial bodies
apologists	pagans	cosmology	

Do the Chapter Assessment.

- Reading Comprehension, Chapter 2 (page 40)
- Critical Thinking and Writing, Chapter 2 (pages 40–41)

Week 4

Does the Big Bang Prove God?

Read the textbook.

- Unit II, "Questions in the Physical Sciences" (pages 43–44)
- Chapter 3, "Does the Big Bang Prove God?" (pages 45–62)

Watch the following video.

- Chapter 3: Does the Big Bang Prove God? (32 minutes) video link

Learn the definitions of these words.

general relativity	Big Bang theory	primordial
philosophical	metaphysical	religious
exponential	gravitational waves	cosmic inflation
interstellar dust	inductive proofs	deductive proofs
Borde-Guth-Vilenkin theorem	probative force	subatomic particles

Do the Chapter Assessment.

- Reading Comprehension, Chapter 3 (pages 62–63)
- Critical Thinking and Writing, Chapter 3 (page 63)

Week 5

Administer and grade Exam 1.

Week 6

How Should We Understand the World of Atoms?

Read the textbook.

- Chapter 4, "How Should We Understand the World of Atoms?" (pages 65–87)

Watch the following video.

- Chapter 4: How Should We Understand the World of Atoms? (31 minutes) video link

Learn the definitions of these words.

chemistry	volition	mole
classical mechanics	quantum mechanics	nucleus
neutrons	protons	electron
orbitals	electromagnetic force	compounds
mass	charge	electron configurations
Pauli exclusion principle	Hund's rule	Heisenberg's uncertainty principle
electromagnetic radiation	atomic spectra	atomic mass
wave-particle duality	interference pattern	photons
quantum	symmetry	dipole moment
gravity	nuclear force	radioactive decay
fermions	bosons	hadrons
leptons	antiparticles	mesons
quark model	quarks	neutrino
positron	antimatter	gluons
Higgs boson	grand unification theories	string theory
prescriptive laws	descriptive laws	

Do the Chapter Assessment.

- Reading Comprehension, Chapter 4 (page 87)
- Critical Thinking and Writing, Chapter 4 (page 88)

Week 7

Does Quantum Mechanics Allow for Free Will?

Read the textbook.

- Chapter 5, "Does Quantum Mechanics Allow for Free Will?" (pages 89–107)

Watch the following video.

- Chapter 5: Does Quantum Mechanics Allow for Free Will? (28 minutes) video link

Learn the definitions of these words.

determinism	anticausal interpretation	hidden variables	ontological
operational	absolute	ideal gas equation	person
abstractions	logic		

Do the Chapter Assessment.

- Reading Comprehension, Chapter 5 (page 107–8)
- Critical Thinking and Writing, Chapter 5 (pages 108–9)

Week 8

Administer and grade Midterm Exam.

Week 9

Did We Evolve from Atoms?

Read the textbook.

- Unit III, "Questions in the Biological Sciences" (page 111)
- Chapter 6, "Did We Evolve from Atoms?" (pages 113–27)

Watch the following video.

- Chapter 6: Did We Evolve from Atoms? (28 minutes) video link

Learn the definitions of these words.

evolution	biology	clone
computational models	nebula	red giant
white dwarf	supernova explosion	glorified bodies
chemical evolution	spontaneous generation	biogenesis
abiogenesis	prebiotic	proteins
carbohydrates	nucleic acids	primordial soup
biological evolution	protocell	artificial life
potentialities		

Do the Chapter Assessment.

- Reading Comprehension, Chapter 6 (page 128)

- Critical Thinking and Writing, Chapter 6 (pages 128–29)

Week 10

Can a Christian Accept the Theory of Evolution? Theology and Evolution

Read the textbook.

- Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 1, "Theology and Evolution" (pages 131–51)

Watch the following video.

- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 1: Theology and Evolution (31 minutes) video link

Learn the definitions of these words.

genomes	scientism	corporeal
monogenism	polygenism	deoxyribonucleic acid (DNA)

Do the Chapter Assessment.

- Reading Comprehension, Chapter 7, Part 1 (page 152)
- Critical Thinking and Writing, Chapter 7, Part 1 (page 153)

Week 11

Administer and grade Exam 3.

Week 12

Can a Christian Accept the Theory of Evolution? Science of Evolution

Read the textbook.

- Chapter 7, "Can a Christian Accept the Theory of Evolution?" Part 2, "Science of Evolution" (pages 154–89)

Watch the following video.

- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 2: Science of Evolution (38 minutes) video link

Learn the definitions of these words.

microevolution	macroevolution	natural selection
gene	genetic drift	speciation
traits	phenotype	genotype

fossil record	comparative anatomy	strata
bacteria	cyanobacteria	fission
eukaryotes	Cambrian period	Cambrian explosion
invertebrates	chordates	vascular plants
spores	angiosperms	geographical distribution
continental drift	genetics	nucleotides
amino acids	recombination	homologous
paleoanthropology	hominids	mitochondrial DNA
genetic bottleneck	cytoplasm	organelles
mitochondria	Y-chromosome	

Do the Chapter Assessment.

- Reading Comprehension, Chapter 7, Part 2 (pages 189–90)
- Critical Thinking and Writing, Chapter 7, Part 2 (pages 190–91)

Week 13

When Does a Human Life Begin?

Read the textbook.

- Chapter 8, "When Does a Human Life Begin?" (pages 193–204)

Watch the following video.

- Chapter 8: When Does a Human Life Begin? (16 minutes) video link

Learn the definitions of these words.

sperm	egg	gametes
zygote	gastrulation	blastula
monozygotic	blastomeres	brain waves
electroencephalograph (EEG)	conception	

Do the Chapter Assessments.

- Reading Comprehension, Chapter 8 (pages 204–5)
- Critical Thinking and Writing, Chapter 8 (page 205)

Week 14

We Don't Need to Choose between Faith and Science

Read the textbook.

- Summary, "We Don't Need to Choose between Faith and Science" (pages 207–12)

Watch the following video.

- Conclusion: We Don't Need to Choose Between Faith and Science (9 minutes) video link

Week 15

Administer and grade Final Exam.

Week 16

Course paper is due.

APPENDIX A: VIDEO LIST FOR *PARTICLES OF FAITH*

- Introduction: Welcome to a Course on Faith and Science! (15 minutes) video link
- Chapter 1: The Navigation Process (18 minutes) video link
- Chapter 2: What Does Christianity Contribute to Science? (30 minutes) video link
- Chapter 3: Does the Big Bang Prove God? (32 minutes) video link
- Chapter 4: How Should We Understand the World of Atoms? (31 minutes) video link
- Chapter 5: Does Quantum Mechanics Allow for Free Will? (28 minutes) video link
- Chapter 6: Did We Evolve from Atoms? (28 minutes) video link
- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 1: Theology and Evolution (31 minutes) video link
- Chapter 7: Can a Christian Accept the Theory of Evolution? Part 2: Science of Evolution (38 minutes) video link
- Chapter 8: When Does a Human Life Begin? (16 minutes) video link
- Conclusion: We Don't Need to Choose Between Faith and Science (9 minutes) video link

APPENDIX B: EXAMS FOR *PARTICLES OF FAITH*

All exams are available at www.avemariapress.com/resources.

- Exam 1
- Midterm Exam
- Exam 3
- Final Exam