

Dominican International School



Environmental Science COURSE SYLLABUS

GRADE LEVEL: 12

SCHOOL YEAR: 2023-2024

TEACHER: Dr. Ram Gopal

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COURSE DESCRIPTION:

Students in high school continue to develop their understanding of the core ideas in the physical sciences and Earth Science. These ideas include the most fundamental concepts from chemistry, but are intended to leave room for expanded study in upper-level high school courses. These performance expectations blend the core ideas with scientific and engineering practices and crosscutting concepts to support students in developing useable knowledge to explain ideas across the science disciplines. In the performance expectations at the high school level, there is a focus on several scientific practices. These include developing and using models, planning and conducting investigations, analyzing and interpreting data, using mathematical and computational thinking, and constructing explanations; and to use these practices to demonstrate understanding of the core ideas. Students are also expected to demonstrate understanding of several engineering practices, including design and evaluation.

The content of the Earth Science performance expectations are based on current community-based geoscience literacy efforts such as the Earth Science Literacy Principles (Wyssession et al., 2019), and is presented with a greater emphasis on an Earth Systems Science approach.

The performance expectations in **HS. History of Earth** help students formulate answers to the questions: “How do people reconstruct and date events in Earth’s planetary history?” and “Why do the continents move?”

The performance expectations in **HS. Earth’s Systems** help students formulate answers to the questions: “How do the major Earth systems interact?” and “How do the properties and movements of water shape Earth’s surface and affect its systems?”

The performance expectations in **HS. Weather and Climate** help students formulate an answer to the question: “What regulates weather and climate?”

The performance expectations in **HS. Human Impacts** help students formulate answers to the questions: “How do humans depend on Earth’s resources?” and “How do people model and predict the effects of human activities on Earth’s climate?”

COURSE OBJECTIVES:

HS. History of Earth

The Student must follow NGSS standards for their curriculum as mentioned in the following paragraphs:

HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.

HS-ESS1-6. Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.

HS-ESS2-1. Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.

HS. Earth's Systems

The Student should be able to:

HS-ESS2-2. Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.

HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.

HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.

HS-ESS2-6. Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.

HS-ESS2-7. Construct an argument based on evidence about the simultaneous coevolution of Earth systems and life on Earth.

HS. Weather and Climate

The Student should be able to:

HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth systems result in changes in climate.

HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.

HS. Human Impacts

The Student should be able to:

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.

HS-ESS3-3. Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

ASSESSMENT:

There will be both formal and informal assessments. For content assessment, each unit will end with a test. For each student's grade, the assessment will be as follows, in accordance with the school's assessment policy:

1/3 Quarter exam

1/3 Homework, Seatwork, Projects:

1 Group project per semester including a report and presentation. Will be peer assessed as well as teacher assessed.

1 Formally Assessed group laboratory investigation per quarter

1 Individual homework per week (worksheet, concept map, essay, questions from textbook, online quiz etc.)

Notebooks will be graded once per unit to make sure all write ups and classroom activities are up to date

1/3 Quizzes/ tests

1 Multi-choice quiz approximately every 2 weeks

1 Unit test per unit (multi choice and short answer)

Projects, Lab Activities, Homework, and Seatwork will also be assessed.

This course will be assessed on the following four categories:

- Tests and Quizzes (30%)
- Seatwork, Homework and Participation (30%)
- Quarter Exam (30%)
- Department (10%)

PRIMARY TEXTBOOK & OTHER RESOURCES

- **I will follow the following book for the (1st to 4th quarters).**

Text Book Title; Inspire Earth Science: Geology, the Environment, and the Universe, **Authors;** Francisco Borrero, Chia Hui, Dinath Zike et al. **Copyright@** 2020 by The McGraw-Hill companies, Inc.

<https://www.khanacademy.org/science/cosmology-and-astronomy/earth-history-topic>.

ADDITIONAL INFORMATION – Please see Google Classroom for more information.

Class code: {Gr. 12 - St. Vincent Ferrer and Gr.12-St. Pius V} Class code: { **xzkxzap** }

Schedule of Instruction

SUBJECT: Environmental Science

Text Book Title; Inspire Earth Science: Geology, the Environment, and the Universe, **Authors;** Francisco Borrero, Chia Hui, Dinath Zike et al. **Copyright@** 2020 by The McGraw-Hill companies, Inc.

1st QUARTER – TENTATIVE COURSE CONTENT

Week / Date	Topic / <i>Projects</i> / <i>Assessments</i>
Week 1 Aug 10th to 11th <u>Only 2 School Days</u> <i>10 ~ First Day / Orientation Day</i>	Chapter 1 Introduction to earth science 1. Earth Science
Week 2 Aug 14th to 18th <i>15 ~ Opening Mass</i>	Chapter 17 Fossils and the Rock Record 1. The Rock Record 2. Relative Age Dating
Week 3 Aug 21st to 25th	3. Absolute Age Dating 4 Fossil Remains Project - Major Events in Earth's History
Week 4 Aug 28th to Sep 1st	Chapter 13 Plate Tectonics 1. Drifting Continents 2. Seafloor Spreading
Week 5 Sep 4th to 8th <i>8 ~ Holy Mass & VIP Induction</i>	3. Plate Boundaries 4. Causes of Plate Motions Test - Earth's History
Week 6 Sep 11th to 15th <i>12-14 ~ Pre-Exam Days</i>	Chapter 14 Volcanism 1. Volcanoes

Week 7 Sep 18th to 22nd	Chapter 5 Weathering. Erosion, Soil 1. Weathering 2. Erosion and Deposition Start Investigation - Effects of Water on the Earth Materials
Week 8 Sep 25th to 29th <u>No Classes</u> 25-28 ~Teacher's Conference 29 – Moon Festival Holiday	Chapter 7 Water 1.Surface Water Movement 2. Lakes and Freshwater Wetlands 3. Groundwater. Test - Rock Cycle Investigation - Effects of Water on the Earth Materials Due
Week 9 Oct 2nd to 6th 3 Days of Class 5-6 ~Q1 Exams	First Quarter Exam (half day),Record day, Review Quarter Exam and Second Quarter Begins

2nd QUARTER – TENTATIVE COURSE CONTENT

Week / Date	Topic / <i>Projects</i> / <i>Assessments</i>
Week 1 (10) Oct 9th to 13th 3 Days of Class 9-10 – Double 10 Holiday	Chapter 11 Climate 1. Defining Climate 2. Climate Classification
Week 2 (11) Oct 16th to 20th	Chapter 11 Climate 3. Climatic Changes
Week 3 (12) Oct 23rd to 27th	Chapter 11 Climate 4. Impact of Human Activities Test Climate and Biogeochemical Cycles
Week 4 (13) Oct 30th to Nov 3rd 1 - All Saint's Day Mass	Chapter 20 Human Impacts on Resources 1. Populations and the Use of Natural Resources Human Impact on Land Resources

Week 5 (14) Nov 6th to 10th	Chapter 20 Human Impacts on Resources 3. Human Impact on Air Resources 4. Human Impact on Water Resources 1.
Week 6 (15) Nov 13th to 17th	Chapter 21 The Sun-earth-moon system 1. The moon 2. The Sun-Earth-Moon System Project: Design an energy efficient building
Week 7 (16) Nov 20th to 24th	Chapter 21 The Sun-earth-moon system 2. Tools of Astronomy Test - Resources
Week 8 (17) Nov 27th to Dec 1st	Case Study: The Deforestation of the Amazon
Week 9 (18) Dec 4th to 8th 8 - Foundation Day Celebrations	STEM project Resources and the Environment
Week 10 (19) Dec 11th to 15th <u>3 Days of Class</u> 14-15 ~ Q2 Exams	Second Quarter Exam (half day) and Christmas Mass
Dec 18th to Jan 1st	Christmas Holiday

Schedule of Instruction
3rd QUARTER – TENTATIVE COURSE CONTENT
SUBJECT: Chemistry

Week / Date	Topic / <i>Projects</i> / <i>Assessments</i>
Week 1 (20) Jan 3rd to 5th <u>3 Days of Class</u> <i>4 ~ New Year Mass</i>	Chapter 22 Our Solar System 1. Formation of the Solar System 2. The inner Planets
Week 2 (21) Jan 8th to 12th	3. The Outer Planets
Week 3 (22) Jan 15th to 19th	4. Other Solar System Objects
Week 4 (23) Jan 22nd to 26th	Chapter 23 Stars 1. The Sun 2. Measuring the stars
Week 5 (24) Jan 29th to Feb 2nd	3. Stellar Evolution
Week 6 (25) Feb 5th to 9th <u>3 Days of Class</u> <i>8-9 ~ CNY</i>	Chapter 24 Galaxies and the Universe 1.The Milky way Galaxy
Feb 8th to 16th	CNY Holiday
Week 7 (26) Feb 19th to 23rd <i>19 ~ Lenten Mass</i> <i>21-23 ~ Pre-Exam Days</i>	3.Other Galaxies in the Universe
Week 8 (27) Feb 26th to March 1st <u>4 Days of Class</u> <i>28 ~ 228 Memorial Day Holiday</i>	Chapter 15 Earthquakes 1.Forces with in Earth
Week 9 (28) March 4th to 8th <u>4 Days of Class</u> <i>8 ~ Q3 Exams</i>	2.Seismic waves and Earth's Interior

4th QUARTER – TENTATIVE COURSE CONTENT

Week / Date	Topic / <i>Projects</i> / <i>Assessments</i>
Week 1 (29) March 11th to 15th <u>4 Days of Class</u> <i>11 ~ Q3 Exams</i> <i>12 ~ Q4 Begins</i>	Chapter 8 Atmosphere 1. Atmospheric Basics 2. Properties of the Atmosphere
Week 2 (30) March 18th to 22nd <i>18-21 ~ Fire Drill</i>	3. Clouds and Precipitation
March 25th to Apr 5th	Easter Holiday
Week 3 (31) Apr 8th to 12th <i>10 ~ Easter Mass</i>	Chapter 9 Meteorology 1. The Causes of Weather 2. Weather Systems
Week 4 (33) 24-28 Apr 15th to 19th	3. Gathering Weather Data
Week 5 (34) Apr 22th to 26th <i>22-26 ~ AP Mock Exams</i>	Chapter 10 The Nature of Storms 1. Thunderstorms 2. Severe Weather 3. Tropical Storms
Week 6 (35) Apr 29th to May 3rd <i>1-2 ~ Pre-Exam</i> <i>1-10~ Final Exams (K, 5, 8, 12 only)</i> <i>4/29 – 5/10 ~ AP Exams</i>	Q4 EXAM
Week 7 (36) May 6th to 10th <i>1-10~ Final Exams (K, 5, 8, 12 only)</i> <i>4/29 – 5/10 ~ AP Exams</i>	Review
Week 8 (37) May 13th to 17th <u>2 Days of Class</u> <i>15-16 ~ Q4 Exams</i> <i>17 ~ Record Day</i>	Review
Week 9 (38) May 20th to 24th <i>ACTIVITIES: Double check the school calendar and emails from the administration.</i>	Field Trip, Graduation Day
Week 10 (39) May 27th to 31st <i>ACTIVITIES: Double check the school calendar and emails from the administration.</i>	Gradebook Submission