Dominican International School

Environmental Science

COURSE SYLLABUS

GRADE LEVEL: **12** **SCHOOL YEAR**: 2024-2025
TEACHER: Mr. Michael Hoffmann **EMAIL**: mhoffmann@dishs.tp.edu.tw

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 (Wysession 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 be follow NGSS standards for their curriculum as mention in 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 changes to Earth's surface can create feedbacks that cause changes to other Earth systemsHS-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 a follows, in accordance with the schools 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 form 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%)
- Deportment (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.

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ADDITIONAL INFORMATION – Please see Google Classroom for more information**.**

Class code: {Gr. 12 - St. Vincent Ferrer and Gr.12-St. Pius V} Class code:
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Schedule of Instruction

SUBJECT: Environmental Science

1st QUARTER – TENTATIVE COURSE CONTENT

Week / Date	Topic / *Projects* / *Assessments*
Week 1 **Aug 12th to 16th** **5 Days of Class** 12~ First Day / Orientation Day 15~ Opening Mass & Assumption of Our Lady 8:00 15~ Induction of Class, Student Council Officers and DYM	Chapter 1 Introduction to earth science 1. Earth Science
Week 2 **Aug 19th to 23rd**	Chapter 17 Fossils and the Rock Record 1. The Rock Record 2. Relative Age Dating
Week 3 **Aug 26st to 30th** 26~Fire drill? 26~Middle and High School Catholic Bridge Program (after assembly) 28~St. Dominic de Guzman Feast Day Celebration	3. Absolute Age Dating 4 Fossil Remains **Project - Major Events in Earth's History**
Week 4 **Sep 2nd to 6th** 2~House Ceremony	Chapter 13 Plate Tectonics 1. Drifting Continents 2. Seafloor Spreading
Week 5 **Sep 9th to 13th** 9~ Mass & Birthday Mother Mary& VIP Induction	3. Plate Boundaries 4. Causes of Plate Motions **Test - Earth's History**
Week 6 **Sep 16th to 20th** **1 Day of Class** 17~Moon Festival 18-20~ Teacher's Conference	Chapter 14 Volcanism 1. Volcanoes
Week 7 **Sep 23rd to 27th** 24-26~Pre-Exam Days	Chapter 5 Weathering. Erosion, Soil 1. Weathering 2. Erosion and Deposition **Start Investigation - Effects of Water on the Earth Materials**

Week 8 **Sep 30th to Oct 4th**	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 7th to 11th** **1 Day of Class** 7~Launching - Rosary Month and Bullying Prevention Day 8-9 ~Q1 Exams 10~Double Ten 11~Record Day	**First Quarter Exam (half day),** **Record day,** **Review Quarter Exam and Second Quarter Begins**

2nd QUARTER – TENTATIVE COURSE CONTENT

(NB: Depending on time and interest, the teacher may delete and/or add other selections.)	
Week / Date	Topic / *Projects* / *Assessments*
Week 1 (10) **Oct 14thth to 18th** 14~ Second Quarter Begins	Chapter 11 Climate 1. Defining Climate 2. Climate Classification
Week 2 (11) **Oct 21st to 25th** 25 – Book Fair 25- Masquerade Night	Chapter 11 Climate 3. Climatic Changes
Week 3 (12) **Oct 28th to Nov 1st** 1-All Saint's Day Mass	Chapter 11 Climate 4. Impact of Human Activities **Test Climate and Biogeochemical Cycles**
Week 4 (13) **Nov 4th to Nov 8th**	Chapter 20 Human Impacts on Resources 1. Populations and the Use of Natural Resources Human Impact on Land Resources
Week 5 (14) **Nov 11th to 15th**	Chapter 20 Human Impacts on Resources 3. Human Impact on Air Resources 4. Human Impact on Water Resources

Week 6 (15) **Nov 18th to 22nd** 22-Gr.12 Q2 Exam 22 - YSC Contest	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 1. Tools of Astronomy **Test - Resources**
Week 8 (17) **Dec 2nd to Dec 6th** **6~Half Day** Foundation Day Celebrations	Case Study: The Deforestation of the Amazon
Week 9 (18) **Dec 9th to 13th** **3 Days of Class** 12-13 ~Q2 Exams	**STEM project Resources and the Environment**
	Second Quarter Exam (half day) and Christmas Mass
Dec 18th to Jan 1st	**Christmas Holiday**

3rd QUARTER – TENTATIVE COURSE CONTENT

(NB: Depending on time and interest, the teacher may delete and/or add other selections.)	
Week / Date	Topic / *Projects* / *Assessments*
Week 1 (19) **Jan 6th to 10th** **4 Days of Class** 6~Record Day 7~Third Quarter Begins 10 ~ New Year Mass	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
Feb 8th to 16th	**CNY Holiday**
Week 4 (22) **Feb 3rd to 7th**	Chapter 23 Stars 1. The Sun 2. Measuring the stars
Week 5 (23)	3. Stellar Evolution

Feb 10th to 14th 1-14~Catholic Week	
Week 6 (24) **Feb 17th to 21st**	Chapter 24 Galaxies and the Universe 1.The Milky way Galaxy
Week 7 (25) **Feb 24th to 28th** **4 Days of Class** 24~Lenten Mass? 25-27 ~ Pre-Exam Days 24-27~IOWA Assessments 28 ~ Memorial Day Holiday	3.Other Galaxies in the Universe
Week 8 (26) **March 3rd to 7th** 5~ Ash Wednesday	Chapter 15 Earthquakes 1.Forces with in Earth
Week 9 (27) **March 10th to 14th** **4 Days of Class** 14 – Q3 Exams	2.Seismic waves and Earth's Interior

4th QUARTER – TENTATIVE COURSE CONTENT

(NB: Depending on time and interest, the teacher may delete and/or add other selections.)	
Week / Date	Topic / *Projects* / *Assessments*
Week 1 (28) **March 17th 21st** **4 Days of Class** 17 – Q3 Exams 18~ Fourth Quarter Begins 18~ Fire Drill? 19~ Feast of St. Joseph	Chapter 8 Atmosphere 1. Atmospheric Basics 2. Properties of the Atmosphere
Week 2 (29) **March 24th to 28th**	3. Clouds and Precipitation
Week 3 (30) **March 31st to April 4th** **4 Days of Class** 4~Tomb Sweeping	Chapter 9 Meteorology 1. The Causes of Weather 2. Weather Systems
Week 4 (31) **Apr 7th to 11th**	3. Gathering Weather Data
April 14th to April 18th	**Easter Break**

Week 5 (32) **Apr 21st to 25th** 23~Easter Mass 21-25 ~ AP Mock Exams 26~Spring Fair	Chapter 10 The Nature of Storms 1. Thunderstorms 2. Severe Weather Tropical Storms
Week 6 (33) **Apr 28th to May 2nd** 4/29-5/1~ Pre-Exam Days 1-2~ Final Exams (K, 5, 8, 12 only)	**Q4 EXAM**
Week 7 (34) **May 5th to 9th** 5-9~ Final Exams (K, 5, 8, 12 only) 5-9 ~ AP Exams	Review
Week 8 (35) **May 12th to 16th** **4 Days of Class** 14-15~ Q4 Exam 16~ Record Day 12-16 ~ AP Exams	Review
Week 9 (36) **May 19th to 23rd** 19-23 ~ Student Clearance 19~ Baccalaureate Mass 23~Gr. 6 – 7 Recognition and Gr. 8 Graduation	Field Trip, Graduation Day
Week 10 (37) **May 26th to 30th** **4 Days of Class** 26~House Culminating Activity 27~Gr. 9-11 Recognition and Gr. 12 Graduation 28! Class Party 29- ~ Students Last Day 30~ Teachers/Staff Meeting	Gradebook Submission