



Honors Chemistry

Yearlong 2021-2022



ELIGIBLE STUDENTS:

10-12th graders who have taken Algebra 2 or are taking Algebra 2 concurrently. Students must be able to read the text independently, take organized notes, memorize vocabulary and express themselves through essay questions and written laboratory reports.

Please note: Students must have the maturity and self-discipline to study 30-60 minutes of Chemistry daily outside of class time to keep up with this rigorous course. The text is to be read *before* class to allow further discussion and problem-solving during class time. Repetition of exercises will reinforce the concepts. There will be laboratory experiments requiring lab reports which will be completed outside of class. The student completing this course earns one high school course credit.

Class Dates: Begin on Tuesday, September 7, 2021 and end on Thursday, May 26, 2022.

Class Times:

Section 1: Monday, Tuesday & Thursdays: 12:30 pm EST (60-75 min)

Section 2: Monday, Tuesday & Thursday: 3:30 pm EST (60-75 min)

Instructor: Dr. Perlita Martorana

Email: pmartorana.scholeacademy@gmail.com

OFFICE HOURS: Office hours will be arranged as needed. Dr. Martorana is available to schedule appointments by email.

SCHEDULE FOR HONORS CHEMISTRY

CLASS SESSIONS DATES: Classes meet for 32 weeks and 95 classes on the following dates* --

September (11): 7, 9, 13, 14, 16, 20, 21, 23, 27, 28, 30

October (12): 4, 5, 7, 11, 12, 14, 18, 19, 21, 25, 26, 28

November (11): 1, 2, 4, 8, 9, 11, 15, 16, 18, [Thanksgiving Break] 29, 30

December (7): 2, 6, 7, 9, 13, 14, 16, [Christmas Break]

January (10): [Christmas Break], 10, 11, 13, 17, 18, 20, [End 1st Sem.] 24, 26, 27, 31

February (9): 1, 3, 7, 8, 10, 14, 15, 17 [Winter Break], 28

March (14): 1, 3, 5, 8, 10, 12, 15, 17, 21, 22, 24, 28, 29, 31

April (9): 4, 5, 7, [Holy Week], 18, 19, 21, 25, 26, 28

May (12): 2, 3, 5, 9, 10, 12, 16, 17, 19, 23, 24, 26 [End 2nd Semester]

**Please note the above dates and times are the anticipated class sessions for this course. However, all dates are subject to change as the instructor's circumstances might dictate (e.g. illness, family emergency). Any classes canceled by the instructor will be made up at an alternate time designated by the instructor.*

HONORS CHEMISTRY COURSE MAP

QUARTER 1 (Sept 7-Oct 28)

1. Intro: What is Chemistry All About?
2. (1) Measurements
3. (2) Atoms and Substances
4. (3) Atomic Structure

QUARTER 2 (Nov 1-Jan 20)

1. (4) The Periodic Law
2. (5) Chemical Bonding
3. (6) Molecular Theory and Metallic Bonding

QUARTER 3 (Jan 24-Mar 18)

1. (7) Chemical Reactions and Stoichiometry
2. (8) Kinetic Theory and States of Matter
3. (9) The Gas Laws

QUARTER 4 (Mar 21-May 26)

1. (10) Solution Chemistry
2. (11) Acids and Bases
3. (12) Redox Chemistry

REQUIRED COURSE TEXTS AND SUPPLIES:

- 1) [General Chemistry](#) by John D. Mays, Novare Science and Math, 3rd edition, 2021
- 2) [Chemistry Experiments for High School at Home](#) by Christina H. Swan and John D. Mays, Novare Science and Math, 2019.
- 3) [The Student Lab Report Handbook](#) by John D. Mays, Novare Science and Math, 2nd edition, 2014.
- 4) [Solutions Manual to Accompany General Chemistry](#) by John D. Mays. Novare Science and Math 2014. This is a companion answer key to the problems in the text allowing students to check their work. ISBN 978-0-9883228-9-9. **Do not purchase the Complete Solutions and Answers for General Chemistry** (teacher only).
- 5) [Economy Lab Kit for Use with Novare General Chemistry](#), Home Science Tools.
- 6) Household Items for Lab: Sand (sand box sand or other coarse sand), aluminum foil, soda can, ethyl or isopropyl alcohol (>90%), baking soda, long-tipped butane lighter, distilled water, straight pin, three types of antacids. **NOTE:** A parent is expected to be present during the formal experiments to assure adherence to the safety protocols. The students will be informed of additional, informal investigations utilizing household items that supplement certain concepts in chemistry. The laboratory supplies will need to be collected prior to class and the students must be ready to conduct the experiments during organized class time.
- 7) Scientific calculator
- 8) Index cards
- 9) Spiral notebook or loose-leaf
- 10) 3-ring binder

HONORS CHEMISTRY COURSE DESCRIPTION

“The most beautiful thing we can experience is the mysterious. It is the source of all true art and science. He to whom the emotion is a stranger, who can no longer pause to wonder, and stand wrapped in awe, is as good as dead; his eyes are closed.” - Albert Einstein

“Great are the works of the LORD, studied by all who delight in them.
Majestic and glorious is his work, his righteousness endures forever.” Psalm 111:2-3

Chemistry helps students develop virtues leading to strong scholarship, but more importantly, it strives to cultivate a sense of wonder about the physical world around them. Besides the acquisition of scientific knowledge, the goal is for students to recognize that they now partake with many scientists throughout history in the pursuit of truth. Growing awareness of the beauty and order of our world, as well as the connection with humanity, will inevitably lead to the true source of all this mystery.

In order to prepare students for college level chemistry, this course uses a mastery approach. The text, *General Chemistry* by John D. Mays, facilitates mastery by covering fewer concepts at a deeper level. Our goal is to have a solid, working comprehension of these concepts and to apply the mathematical calculations accompanying them. Mastering these concepts now will create a tremendous foundation upon which higher level concepts can build in college. Repetitive review of important “standard problems” throughout the year will keep concepts relevant and fresh. This course integrates science with history, mathematics, faith, and the epistemology of science. While receiving a solid foundation in science, we will take time to contemplate and discuss topics in class.

Laboratory: A good scientist must understand well-designed experimentation, the proper interpretation of results, and precise communication of his/her findings. The robust, high quality laboratory component for Honors General Chemistry consists of experiments using laboratory-grade materials. Guidelines for lab report writing will follow *The Student Lab Report Handbook* by John D. Mays. Supplies can be found at Home Science Tools under the name “Economy Lab Kit for use with Novare General Chemistry.”

STUDENT EXPECTATIONS: EXECUTIVE FUNCTION SKILLS

Students enrolling in Scholé Academy's Science Program will be expected to show development of Executive Function Skills throughout the year. Executive Function Skills speaks to a set of qualities and skill sets students can develop and hone to better approach the courses, lectures, readings and teachers they will face in their future academic coursework.

Each teacher will invariably have his own set of requirements and skills he requires students to bring to their studies. I believe there are five such qualities that are necessary for my students in various subjects; and I believe they would be accepted as "good" by many other teachers as well.

1. An Engaged Student: One who is willing to step into the arena of class discussion, ask questions, supply answers, generate the internal dialogue necessary to determine if what's being discussed is important and necessary to himself.

2. Note Taking: A student who during and after being engaged with the class has been trained to note important and relevant content in an organized fashion (Cornell Notes would be a great option). His notes would then be consulted, independently, for application in assignments and assessments.

3. Attention to Detail & Preparedness: These students are ones who consistently adhere to deadlines, submission requirements, adhering to style guides and codes, confirm technology is working prior to the start of class, be responsible to determine how to proceed after an absence, be responsible for consulting his course syllabus and adjusting as the class proceeds, etc.

4. Employ Critiques: These students are ones who receive feedback to one of their submissions, and then are sure to apply that feedback to future assignments rather than repeating mistakes. These students also glean information from the live class critiques of fellow students and note mistakes to avoid by learning from others.

5. Initiative/Maturity: This student would hear the teacher comments and be able to assess whether or not the teacher was describing his work, and then take the initiative to schedule office hours with his teacher if necessary.

STUDENT EXPECTATIONS IN ACTION

In this class, students will be expected to listen attentively and participate actively in class discussions and practices. Students are expected to arrive to class on time and with all assigned material completed. The instructor will facilitate learning for the student, but the responsibility for staying up to date with classwork and assignments ultimately falls to the student.

All assignments will be due into the appropriate Schoology Assignment folder prior to the start of class each day. Students turning in late work will earn a 10% penalty for each day the assignment is late. Students will submit their work by scanning their homework pages and uploading it into the Schoology assignment window. Photographs of completed assignments will not be accepted as they are incredibly difficult to read.

STUDENT EVALUATION: GRADING

While pursuing *Chemistry* through Scholé Academy will be “restful,” we also recognize the need to provide grades for students who will be using this course as part of their prepared college transcript. It’s a delicate balance to achieve both restful learning and excellent academic performance. Earning a specific grade should not overshadow achievement goals for mastery of this discipline. Chemistry is one type of science, and mastery in Chemistry will strengthen a student’s understanding and other science disciplines like biology, physics and technology. The student will be assigned the following grades according to the student’s level of achievement: *magna cum laude* (with great praise); *cum laude* (with praise); *satis* (sufficient, satisfactory) and *non satis* (not sufficient).

Ideally, every average student working diligently should do praiseworthy work (*cum laude*). Those who excel beyond this expectation will be the *magna cum laude* students. Students who do adequate but not praiseworthy work be designated *satis*. *Non satis* means lacking sufficiency or adequacy.

Inasmuch as you might be fully on board with this grading method in theory, there will undoubtedly be the need to complete a college transcript with either a numeric or traditional letter grade. Traditional percentage grades will be provided and will be readily accessed on the *Chemistry* Schoology page. Additionally, Dr. Martorana will provide a transcript of that grade to the requesting parent at the end of the academic year.

STUDENT EVALUATION: MASTERY PORTRAIT

Mastery portrait: Students who are prepared to take this class are typically early to late teens, adolescents approaching young adulthood. This developmental stage is an interesting one, brimming with lots of new characteristics. It's imperative, then, that this course not only provide the academic components necessary to achieve mastery of the content of the class (knowledge) and skills associated with analytical thought; but to also help engage the student in development of their moral virtues. These three aspects of the course would comprise the "learning target."

At the completion of this course *cum laude* students will be able to do the following:

- Use metric system and significant figures fluently.
- Mathematically represent atoms and substances, their density, molar mass and molar number.
- Demonstrate a sound understanding of the periodic table and laws.
- Describe various bonds, draw Lewis structures, name compounds, and write formulas.
- Understand and apply molecular theory.
- Balance chemical equations and perform stoichiometric calculations.
- Describe and apply kinetic theory.
- Understand and apply gas laws.
- Gain working knowledge of solutions and acid-base-chemistry theories.
- Appreciate the role of notable figures in chemical history and describe their contributions to the field.
- Students will also be guided in development of the virtues of love, humility, patience, constancy, perseverance, and temperance. They will be expected to fight against vices like pride, dishonesty, envy, and slothfulness.

STUDENT EVALUATION: ASSIGNMENTS, TYPES & WEIGHTS

Dr. Martorana will communicate with students regarding assignment feedback and grading through the free online grading system, Schoology. The teacher will provide students with more detailed information and access to the Chemistry course page.

Students grades will be comprised of:

1. Exams: 40% of the grade
2. Class Participation: 10% of the grade
3. Quizzes: 30% of the grade.
4. Laboratory Reports: 20% of the grade

STUDENT EVALUATION: ACADEMIC DISHONESTY

Students will often take assessment tests and/or quizzes privately at home. Students are on their honor to abide by [Scholé Academy's Learning Philosophy](#) which assumes the personal cultivation of Student-Virtues and honesty described in the Student-Parent Handbook. Additionally, plagiarism is a serious and punishable offense. A plagiarized assignment will result in a failing grade.

THE VIRTUAL CLASSROOM

We will be using the free online “virtual classroom” software provided by Zoom, one of the leading companies that provides such software. The virtual classroom will provide students with interactive audio, text chat and an interactive whiteboard in which texts, diagrams, video and other media can be displayed and analyzed. We will provide students with a link (via email) that will enable students to join the virtual classroom.

Specific information regarding the technology used by Scholé Academy (including required technology) can be found by visiting the [Technology in the Classroom](#) section of the Student-Parent Handbook.

Students will submit documents by scanning and uploading them to their personal computer, then attaching those files as .pdfs to an email. They will submit their work to the *General Chemistry* Schoology assignment page (access granted after enrollment is secured).

ABOUT THE INSTRUCTOR

Dr. Perlita Martorana is delighted to share the awe of God’s universe with young science scholars. She appreciates the value of learning science from a classical Christian model and encourages students to become virtuous young people in God’s Kingdom while they discover their world. She hopes to impart a sense of curiosity and a desire for lifelong learning beyond chemistry to the students.

She earned a B.S. in Biology from UCLA and an M.D. from the UC San Diego Medical School, then completed 3 years of residency in pediatrics. Dr. Martorana loved her pediatrics practice, but felt it was a higher priority to fully devote her time to forming her own children. Her passion for teaching comes from over 20 years of home-educating her four children and other students in schools, churches, and homeschool groups.

She is active in her church and lives in Southern California with her husband, four children, three cats and two dogs. She loves to travel with her family, whether it be museums, mountains, beaches, road trips, or Europe. Dr. Martorana enjoys a good conversation, walking the dogs, reading, and reflecting on the many blessings from God.