# EAST EARLY COLLEGE HIGH SCHOOL ADVANCED CHEMISTRY SYLLABUS

## Instructor: Mr. RAFAEL A. BETANCOURT

**2022-2023**

**My Welcome: Welcome to ADVANCED CHEMISTRY. I hope that you will enjoy this semester of ADVANCED CHEMISTRY and will carry that enjoyment of chemistry beyond the end of this class. I will present the information in the most exciting way I know. Also, I will try to present the content in a simple and easy to understand way without compromising the academic rigor.**

**Course Description:**

**This course covers fundamental principles of chemistry for majors in the sciences, health sciences, and engineering. Topics include measurements, fundamental properties of matter, states of matter, chemical reactions, chemical stoichiometry, periodicity of elemental properties, atomic structure, chemical bonding, molecular structure, solutions, properties of gases, and an introduction to thermodynamics and descriptive chemistry. This course is a study of atomic and molecular structure, chemical stoichiometry, chemical binding, states of matter, solutions and colloids, and acid-base concepts**

**Course Objective:**

- **Learn Proper Safety Practice and Measures in the chemistry laboratory.**
- **Practice Basic Lab Techniques of Measurement and Conversion**
- **Perform separation of mixtures using proper technique**
- **Identify physical properties**
- **Observe various chemical reactions and write supporting chemical equations**
- **Calculate empirical and molecular formulas and reaction yield**
- **Apply thermochemical principles to evaluate energy relationships based on specific heat, calorimetry, and temperature changes.**
- **Relate the properties of gases with the gas laws and extend the application of these relationships to reaction stoichiometry, gas mixtures, and effusion/diffusion of gases.**
- **Learn Proper Safety Practice and Measures in the chemistry laboratory.**
- **Practice Basic Lab Techniques of Measurement and Conversion**

- **Perform separation of mixtures using proper technique**
- **Identify physical properties**
- **Observe various chemical reactions and write supporting chemical equations**
- **Calculate empirical and molecular formulas and reaction yield**
- **Apply thermochemical principles to evaluate energy relationships based on specific heat, caloriometry, and temperature changes.**
- **Relate the properties of gases with the gas laws and extend the application of these relationships to reaction stoichiometry, gas mixtures, and effusion/diffusion of gases.**
- **Depict chemical bonding with dot structures and valence bond theory and determine the molecular shapes (geometry) of molecules based on VSEPR and valence bond theory.**

**Contact Information:**


**Instructor: Rafael Betancourt.** **Office Phone: 281-904-9057**
**Office: Room 288** **Office Hours: 7:00 am to 4:30 pm**
**HCC Email: rafael.betancourt@hccs.edu**
**rbetanc1@houstonisd.org** **Office Location: room 228**


**Please feel free to contact me concerning any problems that you are experiencing in this course. Your performance in my class is very important to me. I am available to hear your concerns and just to discuss course topics.**

**Honor Code: East Early College High School embodies a spirit of mutual trust and intellectual honesty that is central to the very nature of learning and represents the highest possible expression of shared values among the members of the school community. The core values underlying and reflected in the Honor Code are:**

- **Academic honesty is demonstrated by students when the ideas and the writing of others are properly cited; students submit their own work for tests and assignments without unauthorized assistance; students do not provide unauthorized assistance to others; and students report their research or accomplishments accurately**
- **Respect for others and the learning process to demonstrate academic honesty**
- **Trust in others to act with academic honesty as a positive community-building force in the school**
- **Responsibility is recognized by all to demonstrate their best effort to prepare and complete academic tasks**
- **Fairness and equity are demonstrated so that every student can experience an academic environment that is free from the injustices caused by any form of intellectual dishonesty**
- **Integrity of all members of the school community as demonstrated by a commitment to academic honesty and support of our quest for authentic learning.**

**Policy on Electronic Devices: Once students enter classroom, all electronic devices should be silenced and put away such that they are not visible. These include cell phones, headphones, ear buds, etc. Students may only use electronic devices if authorized by teacher. Teachers may use electronic devices for instruction purposes at their discretion.**

**Make Up and Late Work: Homework and daily class work will not be given full credit, if accepted late. Evaluation on late work will be done on a case-by-case basis at the discretion of the teacher. Make-up work will not be made-up during class time; this time will be reserved for planned instruction. It is the responsibility of the student to get make-up work and to return it to the instructor in a timely manner.**

**Student Success: Expect to spend at least twice as many hours per week outside of class as you do in class studying the course content. Additional time will be required for written assignments. The assignments provided will help you use your study hours wisely. Successful completion of this course requires a combination of the following:**

- **Reading the textbook**
- **Attending class in person and/or online**
- **Completing assignments**
- **Participating in class activities**

**There is no short cut for success in this course; it requires reading (and probably re-reading) and studying the material using the course objectives as a guide.**

**As your teacher, it is my responsibility to:**

- **Provide the grading scale and detailed grading formula explaining how student grades are to be derived**
- **Facilitate an effective learning environment through learner-centered instructional techniques**
- **Provide a description of any special projects or assignments**
- **Inform students of policies such as attendance, withdrawal, tardiness, and making up assignments**
- **Provide the course outline and class calendar that will include a description of any special projects or assignments**
- **Arrange to meet with individual students before and after class as required**

**As a student, it is your responsibility to:**

- **Attend class on time**
- **Participate actively by reviewing course material, interacting with classmates, and responding promptly in your communication with me**
- **Read and comprehend the textbook**

- **Complete the required assignments and exams**
- **Ask for help when there is a question or problem**
- **Keep copies of all paperwork, including this syllabus, handouts, and all assignments**
- **Attain a raw score of at least 50% on the departmental final exam**

**What is POGIL?**
**POGIL is an acronym for Process Oriented Guided Inquiry Learning.**

**POGIL originated in college chemistry departments in 1994; there are now well over 1000 implementers in a wide range of disciplines in high schools and colleges around the country.**

**POGIL uses guided inquiry – a learning cycle of exploration, concept invention and application – as the basis for many of the carefully designed materials that students use to guide them to construct new knowledge.**

**POGIL is a student-centered strategy; students work in small groups with individual roles to ensure that all students are fully engaged in the learning process.**

**POGIL activities focus on core concepts and encourage a deep understanding of the course material while developing higher order thinking skills.**

**POGIL develops process skills such as critical thinking, problem solving, and communication through cooperation and reflection, helping students become lifelong learners and preparing them to be more competitive in a global market.**

**A Process Oriented Guided Inquiry Learning (POGIL) classroom or lab consists of any number of students working in small groups on specially designed guided inquiry materials. These materials supply students with data or information followed by leading questions designed to guide them toward formulation of their own valid conclusions - essentially a recapitulation of the scientific method. The instructor serves as facilitator, observing and periodically addressing individual and classroom-wide needs.**

**POGIL is a research-based learning environment where students are actively engaged in mastering course content and in developing essential skills by working in self-managed teams on guided inquiry activities. It is both a classroom and laboratory technique that seeks to simultaneously teach content and key process skills such as the ability to think analytically and work effectively as part of a collaborative team.**

**POGIL is based on research indicating that**

- **Teaching by telling does not work for most students,**

- **Students who are part of an interactive community are more likely to be successful**
- **Knowledge is personal; students enjoy themselves more and develop greater ownership over the material when they are given an opportunity to construct their own understanding.**

**POGIL can be implemented wholesale or as an occasional variant on regular class meetings. Either way, the effective use of POGIL involves several elements:**

- **The material: effective guided inquiry exercise**
- **Successful learning team: students are assigned specific roles that rotate periodically.**
- **A new role for the instructor: the instructor acts as the facilitator of learning**
- **PLEASE USE RED INK FOR THE INITIALS AND THE SIGNATURE.**
- **ALL POGIL DOCUMENTS MUST BE COMPLETED BY HANDWRITTEN IN ORDER TO RECEIVED FULL CREDICT. _____**

**GRADING POLICY**

- **Percentage Weightings for Student Assessment Components**

| Assessment mode | Percentage (CHEM) | Student' Initials |
|---|---|---|
| **SUMMATIVE ASSESSMENT** | **40%** | |
| • End of Topic Test/ Quizzes<br>• Mayor projects<br>• Essays | | |

| | | |
|---|---|---|
| **FORMATIVE ASSESSMENT** | **60%** | |
| • **Classwork**<br>• **Homework/CK-12**<br>• **Lab documents**<br>• **POGIL DOCUMENTS** | | |
| **TOTAL** | **100%** | |

- **FALL/SPRING SEMESTRAL EXAMS RUBRIC**

| ASSESSMENT MODE | PERCENTAGE | Student' Initials |
|---|---|---|
| FREE RESPONSE SECTION | 50% | |
| PRACTICAL WORK | 35% | |
| CHEMISTRY ESSAY/ 3 SLIDES POWER POINT | 25% | |
| ACS RESULT | POINTS ADD TO THE SEMESTRAL GRADE | |
| | | |
| TOTAL | 110% | |

- **GRADING: The standard HISD grading scale will be followed:**

| LETTER | PERCENTAGES |
|---|---|
| A | 100 - 90 |
| B | 89 - 80 |
| C | 79 - 75 |
| D | 74 - 70 |
| F | 69 and below |

- **RETAKE EXAMS and CORRECTION of EXAMS POLICY. THE STUDENTS MUST ATTEND TO TUTORIAL SESSIONS BEFORE BEING ALLOWED TO REKATE ANY ASSIGMENT WITHIN 3 ACADEMIC DAYS AFTER RECEIVING THE CORRESPONDING GRADE. _____**

**Make Up and Late Work: Homework and daily class work will not be given full credit, if accepted late. Evaluation on late work will be done on a case-by-case basis at the discretion of the teacher. Make-up work will not be made-up during class time; this time will be reserved for planned instruction. It is the responsibility of the student to get make-up work and to return it to the instructor in a timely manner**.

- **RE-DO HOMEWORK POLICY _____**
- **RE-DO LABS POLICY _____**
- **LATE HOMEWORK POLICY _____**
- **EXTRA WORK POLICY _____**
- **SAFETY VIOLATION POLICY:**
    1. **FIRST VIOLATION _____**
    2. **SECOND VIOLATION _____**
    3. **THIRD VIOLATION _____**

    **THE SAFETY CONTRACT WILL BE VOID AFTER THE THIRD VIOLATION AND THE STUDENT MUST DO ANOTHER SAFETY TRAINING ( SATURDAY ).**
- **THE MAXIMUN GRADE OF THE RETAKE, RE-DO HOMEWORK, AND LATE WORK IS 75%**

**Chemistry Classroom Rules and Expectations**

**Tardiness**

**When a student enters the classroom after the bell, that student will often miss instruction or directions. The situation may also become a distraction to the other students.**

**Therefore, I'm enforcing the following concerning tardiness:**

**1st and 2nd Offense—Verbal Warning**

**` Every 3rd Offense—after-school detention with parental notification**

**Habitual—Conference & Office referral**

**Classroom Environment**

**A proper learning environment mirrors respect for each other and your environment.**

**I believe no student should prevent me for teaching and another student from learning. For the classroom to remain a learning environment for everyone, the following rules will be enforced:**

| CLASSROOM RULES | STUDENT' INITIALS |
|---|---|
| Follow directions the first time they are given | |
| Be in class on time | |
| Do not interrupt the normal flow of the class instructions: remain engage during lectures. | |
| Do not eat food or candy during class. Gum chewing is not allowed | |
| Come to class with all materials and be ready to begin working | |

**FALL SEMESTER**

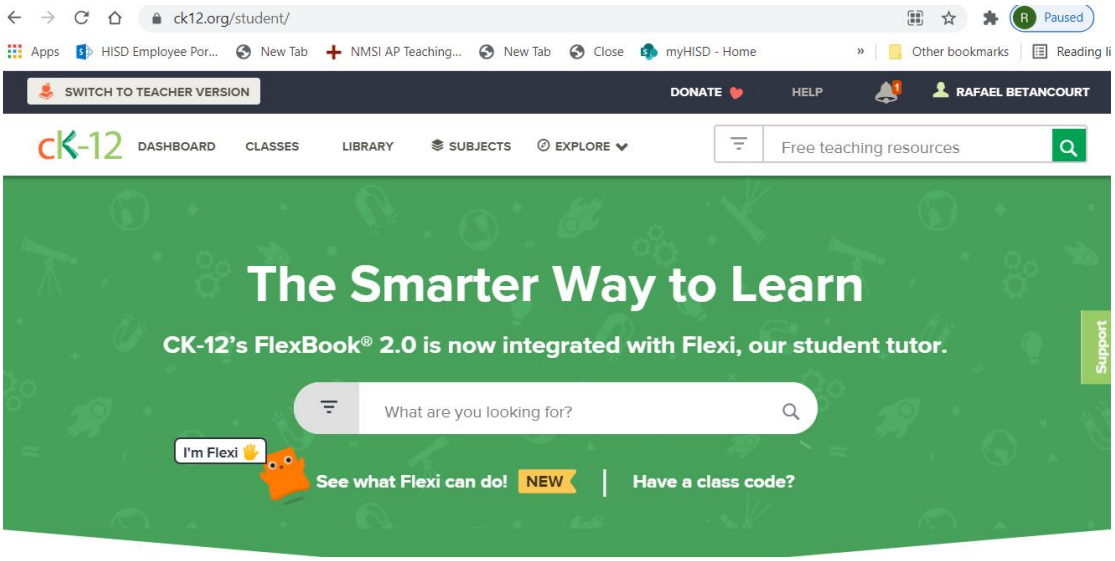
| TOPIC | CYCLE |
|---|---|
| 1. FUNDAMENTAL CONCEPT OF MATTER | 1ST CYCLE |
| 2. THE PERIODIC TABLE | 1ST CYCLE |
| 3. ATOMIC AND NUCLEAR CHEMISTRY | 2ND CYCLE |
| 4. COMBINING ELEMENTS | 2ND CYCLE |
| 5. CHEMICAL REACTIONS | 3RD CYCLE |
| 6. FALL SEMESTRAL EXAM (Practical+ essay + free response) | 4th CYCLE |

**SPRING SEMESTER:**

| TOPIC | CYCLE |
|---|---|
| 7. SOLUTIONS | 4th CYCLE |
| 8. ACID AND BASES AND REACTIONS | 4TH CYCLE |
| 9. BEHAVIOR OF GASES | 5TH CYCLE |
| 10. THERMOCHEMISTRY | 5TH CYCLE |

| | |
|---|---|
| **11. OXIDATION / REDUCTION** | **6TH CYCLE** |
| **12. ORGANIC CHEMISTRY** | **6TH CYCLE** |
| **13. SPRING SEMESTRAL EXAM (practical, MCQ, structure Question and essay)** | **6th** |

**ONLINE RESOURCES**




| PERIOD | CODE | SIGN IN ADDRESS |
|---|---|---|
| A1 | ak20u | https://www.ck12.org/group/1329032/ |
| A3 | df32x | https://www.ck12.org/group/1329004/ |
| B1 | dzhia | https://www.ck12.org/group/1329007/ |
| B2 | euk6s | https://www.ck12.org/group/1329010/ |
| B4 | y2kav | https://www.ck12.org/group/1329013/ |

**INSTRUCTIONS:**

- **Type the Last name and First name in capitals letters.**
- **The password for your class should be:**

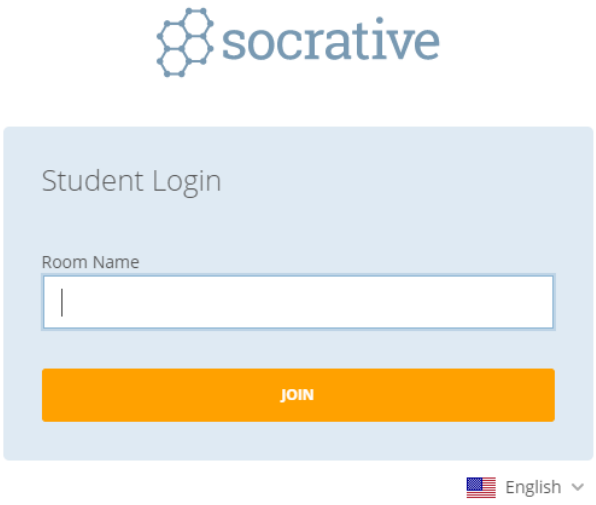
| PERIOD | USERNAME | PASSWORD |
|---|---|---|
| A1 | LAST FIRST NAME | A1ADVCHEM |
| A3 | LAST FIRST NAME | A3ADVCHEM |
| B1 | LAST FIRST NAME | B1ADVCHEM |
| B3 | LAST FIRST NAME | B3ADVCHEM |
| B4 | LAST FIRST NAME | B4ADVCHEM |

1. **KHAN ACADEMY**
   **https://www.khanacademy.org**

2. **PTABLE**
   **www.ptable.com**

3. **ANIMATIONS: phet Colorado EDU**
   **https://phet.colorado.edu/**

4. **SOCRATIVE ROOM**
   **www.socrative.org**




**EECHSBETANCOURT**
**Students are going to register as follow:**
**PERIOD, LAST NAME FIRST NAME**
**Students can take three opportunities for taking the quizzes or test. I will select the best grade from the three attempts.**

**I have read, understood, and agreed to adhere to the above class policy.**

**Student name (print) _____ Date: _____**

**Parent name (print) _____ Date_____**