



## IS 352.51E, 80362, Science Inquiry II

COURSE SYLLABUS: Fall 2022  
Class meets T 5:00-7:30 pm, CHEC 229

### INSTRUCTOR INFORMATION

**Instructor:** Kenric Davies, MAT

**Office Hours:** By Appointment ONLY W/TH 6:00-8:00 pm via [Zoom](#)

**University Email Address:** [Jeanine.Gaitan@tamuc.edu](mailto:Jeanine.Gaitan@tamuc.edu)

**Preferred Form of Communication:** email

**Communication Response Time:** 24 hours, weekdays only

### COURSE INFORMATION

**Materials** – Textbooks, Readings, Supplementary Readings

Textbook(s) **Required: IS 352 Lab Manual – New Edition** available only at the campus bookstore. These are custom printed. Confirm you get the correct manual.

ISBN: 9781645651543

Software Required: regular MS Office (or equal), Google Drive access

**Recommended Materials:** notebook, calculator, computer, scanner or scanner app, and note-taking materials

### Course Description

Science topics and themes are chosen to emphasize broad concepts highlighted in the Texas and National Science Standards. Topics include fundamental physical and chemical processes such as the chemistry of the environment, macromolecules of life, systems in nature, and the nature of scientific inquiry. The course will be taught using an inquiry-based method, modeling instructional techniques proven effective by current educational research. This course is designed for interdisciplinary majors. It will not count towards a major in the sciences. Prerequisites: Junior-level standing.

#### *Practical description*

Science spans a broad range of topics, from biology to geology to astronomy. More than just a collection of facts, science provides a way of learning about and understanding the world. Scientific study leads to many technological advances. Science can be both fun and interesting to learn. In this course, the nature of science and the scientific method are introduced. Critical thinking is

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emphasized. Primarily chemistry-related topics are covered. These topics include states of matter, atoms, and molecules, the periodic table, chemical reactions, and acids and bases. This course models inquiry-based teaching methods.

## **Topics covered:**

### **Physical Changes**

The purpose of this unit is to introduce students to the small particle theory of gases, liquids, and solids. Through experiments, demonstrations, and movies, they will observe macroscopic phenomena and then, with the aid of computer simulations, try to explain the phenomena in terms of small particle theory. Students will explore the changes of states of matter, consider liquids, and the change of state from gas to liquid. They are introduced to different forms of matter and can be used to distinguish substances from one another, such as the characteristic property of density. Students also examine the differences between solids and liquids. Students will examine the role of energy in physical changes and come up with energy models for the heating and cooling of substances and for changes of state between solids, liquids, and gases.

### **Chemical Reactions**

In this unit, students use the small particle model to explain changes to materials (gases, liquids, or solids) that do not involve changes to the physical identities of the materials. They will explore what happens when materials interact in a way such that their chemical identities change, indicating a chemical reaction. Students will learn about the evidence supporting the claim that a chemical reaction has occurred and to classify materials as pure substances (elements and compounds) and mixtures (solutions and heterogeneous mixtures) according to macroscopic criteria. Students will gather evidence to conclude that mass is conserved during chemical reactions as well as during physical changes. Students will learn about the small particle theory of chemical reactions and that elements and compounds are composed of small particles—atoms, molecules, and formula units and become familiar with both pictorial and chemical equation representations of reactions. Students learn about how elements can be classified and organized and develop a general understanding of the organization of the Periodic Table. Students will learn how the macroscopic organization of the Periodic Table can be simply ‘explained’ in terms of atoms, ions, and the behavior of valence electrons. They will use the Lewis Dot Diagram Model to describe both ionic and covalent bonding, which provides insight as to why molecules or formula units are comprised of very specific numbers of different atoms. Students will use what they have learned to explain everyday chemical and physical phenomena.

### **The Living World**

The main purpose of this unit is to introduce students to the living world around us. Students learn that biological structures at multiple levels of organization perform specific functions and processes that affect life and to relate the functions of different types of biomolecules, including carbohydrates, lipids, and vitamins, to the function of cells.

## **Student Learning Outcomes**

1. Students will gain a better pedagogical understanding.
  - Students will identify and practice different teaching methods.
  - Students will identify different learning styles.
  - Students will be able to determine how teaching and learning styles complement or support material in various situations.
  - Students will better understand the NGSS/TEKs alignment and how that process applies to content delivery.
  - Students will be able to find science lessons appropriate for use in K-8 classrooms and identify which TEKS they satisfy.
2. Students will be better prepared to achieve success by completing the TExES exam.
  - Students will be able to describe the parts of the atom.
  - Students will be able to determine whether a change is physical or chemical.
3. Students will assist the instructor through cooperative learning to provide interesting and practical science knowledge and skills for taking instruction into the classroom and everyday life.
  - Students will learn and practice student-centered instruction.
  - Students will develop a plan for laboratory safety and classroom management through daily practice and techniques.

## **COURSE REQUIREMENTS**

### **Minimal Technical Skills Needed**

D2L will be used for grades and as a venue/repository of review material and PowerPoints. All work to be graded will be submitted within the D2L platform. Students should have a basic understanding and ability to manage fundamental computer skills such as word processing, spreadsheets, & presentations. We will be using the Google Suite (Google Docs, Sheets, etc) during this course.

### **Instructional / Methods / Activities Assessments**

This class will meet in CHEC 229 from 5:00 -7:30 pm on Tuesdays. Lectures and/or readings will be used to introduce topics. Students are encouraged to ask questions during lectures. However, the primary instructional method for this course will be hands-on activities. Activities will be completed in groups of 3-4. The instructor will assign groups. Groups will be changed 1-2 times during the semester.

Education research shows that learning is enhanced through group work. Students can do more together than they can do on their own.

### **Student Responsibilities or Tips for Success in the Course**

This class requires regular attendance as much of the content is delivered in a hands-on format that will build from one lesson to the next. If you miss a class, you may miss the skills needed for the next and future lessons. Missing even one class can cause a significant gap in your learning and understanding. The best thing you can do to be successful in this class is to not miss class.

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## Grading

Grades will be based on four components:

Exams	45%
Notebook	25%
Homework	20%
In-class activities and labs	10%

Grading scale:

$90\% \leq A < 100\%$
$80\% \leq B < 89\%$
$70\% \leq C < 79\%$
$60\% \leq D < 69\%$
$F < 60\%$

### **Tentative Exam Dates**

- 1) September 26
- 2) November 14
- 3) Finals Week

In order to pass the course, you must achieve a 65 or higher on at least one exam (first exam, second exam, or final), regardless of your average calculated using the above weighting.

## Assessments

**Exams:** There will be two midterms and a final. They will be weighted equally. Midterms will be scheduled at least two weeks in advance. The date will depend on the speed at which the material is covered. See the course outline for approximate dates. Make-up exams will only be allowed for excused absences. See course policies below for details on excused absences.

**Notebook:** Guidelines for the notebook will be provided in a separate document.

**In-class activities and labs:** Activities and labs will be graded. Assignments will be completed as a group, but your effort will determine your individual score. Your lowest grade will be dropped. Group activities can only sometimes be made up.

**Homework:** Homework will be graded. Assignments will be graded individually. Your lowest grade will be dropped.

**Class participation:** You will receive a participation grade for each class day (except the first day and exam days) based on your participation in group activities. The lowest three grades will be dropped.

### *Participation grade calculation:*

1. An absence will result in a zero for the missed class. This includes excused absences. If you have more than 3 excused absences, the resulting zeroes will be dropped before the calculation of your average. (See course policies below for details on excused absences.)
2. Missing 15-35 minutes of class will result in a 20-point deduction. Missing more than 35 minutes of class will result in a 50-point deduction. This includes tardiness, leaving early before finishing all class activities, or missing a portion of the middle of class.
3. The instructor will provide students with their participation through the D2L-Brightspace grade portal.

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# COURSE AND UNIVERSITY PROCEDURES/POLICIES

## Course Specific Procedures/Policies

### Course Specific Policies

Violation of any class policies will be reflected on the student's final grade for the course.

1. Attendance will be taken by sign-in sheet at the beginning of class.
2. The instructor must be notified by email ([Kenric.Davies@tamuc.edu](mailto:Kenric.Davies@tamuc.edu)) about any excused absences **no later than 24 hours after the missed class**. Even if you choose to notify the instructor in person, you **must still follow up with email** within 24 hours of the missed class. If you do not follow this policy, you will have the zero participation grade counted and may not be able to make up a missed exam.
3. You are responsible for obtaining notes and class announcements from missed classes.
4. Excessive absences may result in being dropped from the course.
5. When emailing the instructor, include the **course and section number in the subject line**.
6. You are expected to check your email at least once a day for class announcements. Emails will be sent to the email addresses you provided to MyLeo. Notify the instructor if you would prefer to receive emails at a different address.
7. Homework is due at the beginning of class.
8. Students should fully participate in class activities. Failure to do so will impact the student's class participation grade.
9. Students are expected to be professional and respectful and take responsibility for their learning. If you find yourself struggling, the instructor is available to provide extra help outside of class.

### Course Specific Procedures

1. Students are required to take all exams which must be completed before the exams are returned to the class. Exams are 45% of your grade, 15% each.
2. Students will be responsible for their learning and participate in all class activities with a positive, constructive attitude. Professionalism will be practiced.
3. Students will participate and contribute equally in-group activities. Failure to comply will be reflected in the non-compliant student's grade and will not be a detriment to the remaining group members. All collaborative assignments will have an individual grade for each student, dependent upon their contribution, collaboration, content, and professionalism. If there is a conflict within a group, please see me.

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4. Students are welcome to visit during office hours or make an appointment if the posted hours do not fit their need. If you are struggling, seek assistance early, I am here to help you learn.

ALL students have the option to earn an A for this class. However, extra credit is not usually offered. Although I have the right to drop a student for excessive absences, I won't do so. Students have the right to earn an F if they decide not to complete the work. I generally do not offer or approve drops/incompletes for poor effort. Remember you are training to teach, which will affect the next generation of students.

### **Syllabus Change Policy**

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

### **University Specific Procedures Student Conduct**

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](#).

<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: <https://www.britannica.com/topic/netiquette>

### **TAMUC Attendance**

For more information about the attendance policy please visit the [Attendance Procedure 13.99.99.R0.01](#).

<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

### **Academic Integrity**

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

[Graduate Student Academic Dishonesty 13.99.99.R0.10](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf>

### **Students with Disabilities-- ADA Statement**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation

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requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

### **Office of Student Disability Resources and Services**

Texas A&M University-Commerce

Gee Library- Room 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: [studentdisabilityservices@tamuc.edu](mailto:studentdisabilityservices@tamuc.edu)

Website: [Office of Student Disability Resources and Services](#)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

### **Nondiscrimination Notice**

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

### **Campus Concealed Carry Statement**

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](#) document and/or consult your event organizer.

Web url:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

### **A&M-Commerce Supports Students' Mental Health**

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit [www.tamuc.edu/counsel](http://www.tamuc.edu/counsel)

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# COURSE OUTLINE / CALENDAR

The syllabus and/or schedule are subject to change.

## Science

*Standard I.* The science teacher manages classroom, field, and laboratory activities to ensure the safety of all students and the ethical care and treatment of organisms and specimens.

*Standard II.* The science teacher understands the correct use of tools, materials, equipment, and technologies.

*Standard III.* The science teacher understands the process of scientific inquiry and its role in science instruction.

*Standard IV.* The science teacher has theoretical and practical knowledge about teaching science and about how students learn science.

*Standard V.* The science teacher knows the varied and appropriate assessments and assessment practices to monitor science learning.

*Standard VI.* The science teacher understands the history and nature of science.

*Standard VII.* The science teacher understands how science affects the daily lives of students and how science interacts with and influences personal and societal decisions.

*Standard VIII.* The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in physical science.

*Standard IX.* The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in life science.

*Standard XI.* The science teacher knows unifying concepts and processes that are common to all sciences.

[https://tea.texas.gov/sites/default/files/EC\\_6\\_Science\\_Final%283%29\\_0.pdf](https://tea.texas.gov/sites/default/files/EC_6_Science_Final%283%29_0.pdf)

[https://tea.texas.gov/sites/default/files/4-8sci\\_0.pdf](https://tea.texas.gov/sites/default/files/4-8sci_0.pdf)

In science, many of the concepts work in conjunction with others. The weekly outline is general and not specific. (list outline is for a long semester)

<u>Date</u>	<b>(Exam dates are approximate.)</b>		
8/29	Syllabus, Relationships, Nature of <b>Science</b>	10/17 10/24	Elements, Compounds, Mixtures Balancing Chemical Equations
9/5	Properties of Matter	11/7	Acids & Bases, pH
9/12	States of Matter	11/14	<b>Exam 2 – Atoms, Elements, Reactions</b>
9/19	Physical/ Chemical Changes		Sugars and Starches
9/26	<b>Exam 1 – Matter and Physical/ Chemical Changes</b>	11/21 11/28	Fats and Vitamins
10/3	Atoms	12/5	Review
10/10	Periodic Table	12/12	<b>Final Exam (normal class time)</b>

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