I. INTRODUCTION
A. Historical Geology is an introductory one-semester course about the materials and processes of the Earth. Topics included are: minerals, rocks, plate tectonics, continental evolution, earthquakes, volcanoes, weathering and erosion, running water, ground water, mass wasting, and others. The study of regional rocks and minerals, and the opportunity for field observation and collection are provided.
B. This fulfills a Science requirement for completing the core requirements for AA/AS degrees and transfers to other Texas public colleges and universities for BA/BS degrees. This course is required for degrees in geology, environmental sciences, and hydrology/water resources. The course can be occupationally related, serving as preparation for careers in teaching, the earth sciences, military service, engineering, hydrological science, urban planning, and perhaps other fields as well.
C. In support of the objectives of the Texas core curriculum, this course provides significant exercise of students' critical thinking, communication skills, teamwork, and empirical and quantitative skills. These objectives form a foundation of intellectual and practical skills that are essential for all learning.
   A. Critical thinking skills include creative thinking, innovation inquiry, and analysis, evaluation and synthesis of information.
   B. Communication skills include effective development, interpretation, and expression of ideas through written, oral, and visual media.
   C. Teamwork includes the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.
   D. Empirical and quantitative skills include the ability to manipulate and analyze numerical data or observable facts to reach informed conclusions.
D. Prerequisite: None

II. LEARNING OUTCOMES
Upon successful completion of GEOL 1404, Historical Geology, the student will:

   A. Identify and explain the fundamental concepts and theories of historical geology.
   B. Summarize the history and evolution (geological, chemical, and biological) of the Earth.
   C. Identify and describe the major fossil groups and explain the significance of their interrelationships and their relation to the rocks in which they are found.
   D. Interpret the geology of an area when various data are provided, and describe the significant relationships indicated by the data.
E. Defend geology as a worthy field of endeavor.
F. Demonstrate increased knowledge of North American and world geography as it applies to historical geology.
G. Show increased knowledge and comprehension of local, Texas, North American, and world geology.
H. Explain how knowledge of historical geology benefits humanity.
I. Demonstrate the ability to read and interpret physical and geologic maps.
J. Demonstrate the ability to read, comprehend, and interpret geological photos, diagrams, graphs, tables, and models (both physical and mental).
K. Show increased comprehension and appreciation for the history, nature, and methods of science and geology.
L. Display positive attitudinal changes regarding the geosciences.
M. Evaluate the validity of past and present geological concepts, hypotheses, and theories of historical geology.
N. Conclude that the principles of cause and effect and feedback apply directly to the several areas and themes of geology.
O. Work independently and cooperatively to use critical thinking skills during laboratory investigations and field experiences.
P. Apply thought processes and skills learned in the classroom or laboratory setting to real world situations encountered in every-day life.

III. INSTRUCTIONAL MATERIALS

The instructional materials identified for this course are viewable through www.ctcd.edu/books
Students will be required to have a copy of Earth System History 4th edition by Stanley and Luczaj.

IV. COURSE REQUIREMENTS

After studying the material presented in Historical Geology, the student will be able to do the following:

1. Explain what geology is and describe its subparts. (A)
2. Summarize the methods of science. (A)
3. Summarize the various systems that are the principal agents of change in and on the Earth. (A, D)
4. Demonstrate the ability to identify minerals. (A, B, C, D)
5. Demonstrate the ability to identify rocks. (A, B, C, D)
6. Demonstrate the ability to read and interpret geological photos, diagrams, graphs, tables, and models. (A, D)
7. Demonstrate the ability to read and interpret topographic maps. (A, C, D)
8. Compare relative and absolute time, stating how each is determined and used. (A, D)
9. Summarize the modern ideas concerning the forces responsible for large-scale fundamental changes of the Earth's inner and outer regions, and how they relate to catastrophic events that affect humanity. (A, B, D)
10. Describe the subdivisions and significance of the major subdivisions of the Earth's interior. (A, D)
11. Describe the processes and results of mountain building. (A, B, D)
12. Describe the processes of crustal deformation, and the formation of geologic structures. (A, B, D)
13. Describe the theory of plate tectonics and explain how this theory is able to explain the various materials and structures of the Earth's surface. (A, D)
14. Describe the evolution of the Earth (geological, chemical, and biological). (A, B, D)
15. Describe the various mass extinction events that have occurred, their effects on the organisms present at the time, and the theories regarding the cause(s) of these events. (A, B, D)
16. Demonstrate the ability to identify key fossil types found in the geologic record and local area. (A, C, D)
17. Identify and comprehend the importance of key orogenic events from Earth's history. (A, D)

V. EXAMINATIONS

Lecture: 2-6 in class lecture exams and a final exam are given during the semester. The exams given may include any or all of the following types of questions: multiple choice, fill-in-the-blank, matching, true/false, discussion, and identification. The final exam will be comprehensive. Please be advised that your instructor gives challenging exams which involve many levels of question difficulty, including questions which require analysis, synthesis, and other higher-order thinking skills. Point values for exams are determined by your instructor.

Laboratory: 2-4 in class laboratory exams will be given during the semester. These exams may include, but are not limited to, short answer, essay, and identification questions. Please be advised that your instructor gives challenging exams which involve many levels of question difficulty, including questions which require analysis, synthesis, and other higher-order thinking skills. Point values for exams are determined by your instructor.

VI. SEMESTER GRADE COMPUTATION

The final grade in GEOL 1403 is attained by adding together all points on exams, quizzes, and additional items, including writing assignments. The grade distribution scale is as follows:

<table>
<thead>
<tr>
<th>Points</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100%</td>
<td>A</td>
</tr>
</tbody>
</table>

GEOL 1404
VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM THE INSTRUCTOR

A. Course Withdrawal: It is the student's responsibility to officially withdraw from a class if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file a Central Texas College Application for Withdrawal (CTC Form 59). The withdrawal form must be signed by the student.

CTC Form 59 will be accepted at any time prior to Friday of the 12 week of classes during the 16 week fall and spring semesters. The deadline for sessions of other lengths is:

- 10 week session: Friday of the 8th week
- 9 week session: Friday of the 6th week
- 5 week session: Friday of the 4th week

The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

A student who officially withdraws will be awarded the grade of "W" provided the student's attendance and academic performance are satisfactory at the time of official withdrawal. Students must file a withdrawal application with the college before they may be considered for withdrawal.

A student may not withdraw from a class for which the instructor has previously issued the student a grade of "F" or "FN" for non-attendance.

B. Administrative Withdrawal: An administrative withdrawal will be initiated when the student fails to meet college attendance requirements. The instructor will assign the appropriate grade on CTC Form 59 for submission to the registrar.

C. Incomplete Grade: The college catalog states, "An incomplete grade may be given in those cases where the student has completed the majority of the course work but, because of personal illness, death in the immediate family, or military orders, the student is unable to complete the requirements for a course .... " Prior approval from the instructor is required before the grade of "I" is recorded. A student who merely fails to show for the final examination will receive a zero for the final exam and an "F" for the course.

D. Cellular Phones and Electronic Devices: Cellular phones and other electronic devices will be turned off while the student is in the classroom, laboratory, or
in any other learning situation unless the student receives permission from the instructor to use the device. Failure to turn off these devices may result in point deductions at the instructor's discretion.

E. **American’s with Disabilities Act (ADA):** Disability Support Services provide services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Explore the website at [www.ctcd.edu/disability-support](http://www.ctcd.edu/disability-support) for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

F. **Instructor Discretion:** The instructor reserves the right to final decision in course requirements.

G. **Civility:** Individuals are expected to be cognizant of what a constructive educational experience is, be respectful, and show civility to those participating in a learning environment, including field trips and any other situation whose purpose is to promote or enhance learning. Failure to do so can result in disciplinary action up to and including expulsion. Minimal civility includes:

- Being in class on time;
- Staying in class for the entire class period;
- Informing the instructor prior to class that an unavoidable conflict requires your early departure from class, and thereafter positioning yourself to the exit so that your departure causes a minimum disruption or distraction.
- Avoiding such uncivil conduct as talking, sleeping, reading papers or magazines, or working on some assignment which is not directly pertinent to the learning situation at hand;
- Using socially acceptable language in classroom discussions and elsewhere in learning situations.

Additionally your instructor requires you to take personal responsibility for your actions.

H. **The following specific rules apply to absences:** Each instructor shall keep a record of class attendance. An administrative withdrawal may be submitted when a student’s absences exceed **four (4)** class meetings. The instructor will note administrative withdrawals as the grade of "F Non-attendance" on the roll and record book. As a matter of policy, administrative excuses from classes are not provided for any reason. Regardless of the nature of the absence, students are responsible for completing all course work covered during any absence.
I. For complete information consult the college catalog and Student Handbook.

VIII. COURSE OUTLINE

Unit I: Processes and Techniques.
A. Unit Objective: Upon successful completion of this unit the student will:
   1. Explain the theory of plate tectonics.
   2. Describe the Earth's materials.
   3. Discuss various depositional environments.
   4. Exhibit understanding of how to read maps and stratigraphic columns.
   5. Discuss the principles and techniques used to age date phenomena.
   6. Identify and describe common fossil types.
   7. Discuss the Theory of Evolution

B. Learning Activities:
   1. Read the related text material prior to the lecture.
   2. Lecture and discussion on topics.
   3. Lab exercises covering some/all of the lecture topics.

C. Unit Outline
   Chapter 1: Earth as a System
   Chapter 2: Rock-Forming Minerals and Rocks
   Chapter 3: The Diversity of Life
   Chapter 4: Environments and Life
   Chapter 5: Sedimentary Environments
   Chapter 6: Correlation and Dating of the Rock Record
   Chapter 7: Evolution and the Fossil Record
   Chapter 8: Plate Tectonics
   Chapter 9: Continental Tectonics and Mountain Chains
   Chapter 10: Major Chemical Cycles

Unit 2: History of the Earth
A. Unit Objective: Upon successful completion of this unit the student will:
   1. Describe the different time periods throughout Earth's history.
   2. Discuss how the climate, continents, oceans, and life have evolved through time.
   3. Describe the major mass extinction events throughout Earth's history, their causes and the effects on life.

B. Learning Activities:
   1. Read the related text material prior to the lecture.
   2. Lecture and discussion on topics.
   3. Lab exercises covering some/all of the lecture topics.

C. General Unit Outline
   Chapter 11: Hadean and Archean
   Chapter 12: Proterozoic
Chapter 13: Early Paleozoic
Chapter 14: Middle Paleozoic
Chapter 15: Late Paleozoic
Chapter 16: Early Mesozoic
Chapter 17: Cretaceous
Chapter 18: Paleogene
Chapter 19: Neogene
Chapter 20: Holocene