CASPER COLLEGE COURSE SYLLABUS
GEOL 2000, 01 – Geochemical Cycles and the Earth System

Semester/Year: Fall 2015

Lecture Hours: 3 **Lab Hours: 2** **Credit Hours: 4**

Class Time: 1:00 -2:50 p. m. **Days**: MWF **Room:** TM 123

Instructor's name: Dr. Kent Sundell.

Instructor's Contact Information:

Office: Tate Museum Room 103

Office Phone: 268-2498 (O) or 307-259-5258 (cell/text)
Please call prior to 10:00 p.m.

Email:
ksundell@caspercollege.edu.

Office Hours: MWF 8-9 am
MW 12-1 pm

Course Description:
Geology applied to the complete Earth System including Lithosphere, Hydrosphere, Atmosphere and Biosphere interactions, emphasizing rock associations and geochemical cycles on a global scale. We explore the origin of the elements and the solar system, which is a framework of understanding Earth. We then examine the interactions between the components of the Earth System and how it has changed over geologic time, recognizing that rocks provide a record of these past changes. This knowledge helps understand where our earth resources come from and the effects their utilization may have on the system. Understanding Earth's past chemical cycles helps us better assess the future

Prerequisites: GEOL 1100.

Objectives:
This course is designed for geology majors and general science students wanting to see the larger picture of how solid rocks and minerals of the Earth have been continually affected by the chemical interactions with the hydrosphere, biosphere and atmosphere throughout Earth's history. An increased understanding of the origin and dynamic nature of the Earth. Teach quantification of the chemical and physical processes involved in a changing Earth over billions of years of geologic time. To understand the origin of the Earth within the solar system and its uniqueness among the planets. The origin of Earth's atmosphere, hydrosphere, lithosphere and solid interior will be reviewed. The primary dynamic chemical and physical changes throughout Earth's history will be learned. How aspects of Earth's hydrologic and tectonic systems affect chemical cycles will be reviewed. Learn how

the use of isotopes in studying Earth's past environmental and climatic changes may help forecast future change.

Outcomes: **Portions of the following in CC gen ed**
1. Demonstrate effective oral and written communication
3. Solve problems using critical thinking and creativity
6. Use appropriate technology and information to conduct research
8. Use quantitative analytical skills to evaluate and process numerical data

The student is expected to become fluent in general geologic terminology and to understand dynamic processes that continually change the Earth over time. The outcomes will be assessed by regularly scheduled exams, problem solving in labs, writing, pictorial and oral dialogue between the instructor and student throughout the course.

Methodology:
This course will consist of a series of lectures, demonstrations, discussions, problems and field trips, designed to review the main facets of physical geology in greater detail than an introductory course and from a global perspective. The lectures will explain and expand upon the material in the text and will provide up- to-date coverage of what is known in the field of geology. Students are expected to make every effort to attend class meetings, turn in all assigned problems, attend field trips, carefully read all assigned material, and, above all, ask questions when confused or unsure .

Evaluation Criteria:
Student evaluation will be as objectively as possible through the use of regularly scheduled exams and weekly laboratory problem sets. Participation in the day to day give and take of the classroom is an important aspect of a college education. Therefore, students will be expected to attend each and every class meeting and enter into discussions and question-and-answer sessions.

APPROXIMATE POINT DISTRIBUTION
Lecture is approximately 70 % of your final grade

Exam I	150 points
Exam II	150 points
Exam III, Final	150 points
Lab Grade (8 biweekly problems)	200 points
Field trips	20 points extra credit
TOTAL POINTS POSSIBLE: Approximately	650 points

Grade Cutoffs : A : 90 %+ ; B : 80 - 89 % ; C : 70 - 79 % ; D : 60 - 69 % ; F : < 60 %

EXAMS: The exams will be some combination of multiple choice, short answer, and essay. If you have difficulty writing essay answers on exams please contact the Casper College Writing Center for help as soon as possible (before the first exam). Some questions will ask for simple facts. Others will concentrate on solving problems through the application of geological knowledge. I reserve the right to curve exam scores if I decide it is necessary.

Make-up Exams: If you must miss an exam, you will be allowed to make it up only if you contact me prior to your absence with a believable, significant excuse or have an official Casper College excuse for medical or emergency absences. I return all exams to students, so make - up exams will consist of mainly essay questions which I will write separately from the regular exam.

LAB: The lab section will count as approximately 30% (200 points) of your final grade; It consists of eight biweekly problem sets.

FIELD TRIPS: Several local impromptu field trips may be taken during established class time as the topic and weather dictate. Always be prepared to go to the field on Fridays if the weather looks favorable.

Required Text, Readings, & Materials:
The Earth System, 2nd or 3rd ed., by Kump, Kasting and Crane; Pearson Prentice-Hall 2004-2011; other instructional materials, including website readings, may be assigned from time to time.

Class Policies: Last Date to Change to Audit Status or to Withdraw with a W Grade: 11/12/15

Official Means of Communication: Casper College faculty and staff will employ the student's assigned Casper College email account as a primary method of communication. Students are responsible to check their account regularly.

Student Rights and Responsibilities: Please refer to the Casper College Student Conduct and Judicial Code for information concerning your rights and responsibilities as a Casper College Student.

Chain of Command: If you have any problems with this class, you should first contact the instructor in order to solve the problem. If you are not satisfied with the solution offered by the instructor, you should then take your problem through the appropriate chain of command starting with the department head, then the school dean, and lastly the vice president for academic affairs.

Academic Dishonesty - Cheating & Plagiarism: Casper College demands intellectual honesty. Proven plagiarism or any form of dishonesty associated with the academic process can result in the offender failing the course in which the offense was committed or expulsion from school. See the Casper College Student Code of Conduct.

ADA Accommodations Policy: It is the policy of Casper College to provide appropriate accommodations to any student with a documented disability. If you have a known accommodation in this course, please make an appointment to see me at your earliest convenience. To request academic accommodations, students must first consult with the College's disability Services councilor located in the Gateway Building, Room 344, (307) 268-2557, bheuer@caspercollege.edu

Schedule of Topics Covered:

WEEK	TOPIC - READING
Aug. 24	Introduction. Origin of Solar System and Earth -
Aug. 31	The Moon and other planets -
Sep. 7	Geologic Systems on Earth - Ch. 1,2,3 **No class Sept. 7 (Labor Day)**
Sep. 14	Plate Tectonics (PT) – Ch. 7
Sep. 21	Plate Tectonics (PT) – Ch. 7
Sep. 28	Minerals, rocks, and chemistry – Why and where in PT system - **Exam I**
Oct. 5	Atmosphere (origin and interaction with hydrosphere) - Ch . 4, 5, 6
Oct. 12	River systems and ocean systems Ch. 4,5,6 **No class Fall Break Oct 19 & 20**
Oct. 19	Earth circulation systems **-** Oxygen Isotopes
Oct. 26	Biosphere -Origin of Life - Carbon Isoptopes, photosynthesis and oxygen. – Ch. 8,9.
Nov. 2	Geochemical cycles – Carbon Cycle- Burial and weathering of organics Ch. 10, 11, 12
Nov. 9	Other geochemical cycles (Nitrogen, Iron, etc) **Exam II.**
Nov. 16	Climate change in the Pleistocene Ch. 12
Nov. 23	Glacial systems - Ch. 14 **No class Thanksgiving Nov. 25-27**
Nov. 30	Glacial systems
Dec. 2	Climatic Change – Glaciers to deserts – Icehouse to Greenhouse Ch. 15
Dec. 14	Final Week Dec.10-13. **Final Exam III** as scheduled. All Readings