

**ES202W – PRINCIPLES OF GEOLOGY**  
**SEDIMENTARY GEOLOGY AND EARTH SURFACE PROCESSES**

**POLICIES AND PROCEDURES**

Winter Term 2016 - Western Oregon University  
4 CR MWF Lecture 11:00 – 11:50 AM Room 101 Natural Sciences Bldg.  
Lab Options: T 11 AM-1 PM or Wed. 1-3 PM in NS017

INSTRUCTOR:	Dr. S. Taylor	OFFICE:	Rm 210 Natural Sciences Bldg
OFFICE HOURS:	M 2-4 P.M.; W,F 12-1 P.M. By appointment	PHONE:	(w) 838-8398 (cell) 541-760-9216
WEB SITE:	<a href="http://www.wou.edu/taylor">www.wou.edu/taylor</a>	E-MAIL:	<a href="mailto:taylors@wou.edu">taylors@wou.edu</a>

**COURSE DESCRIPTION**

This is an introductory course in Physical Geology that focuses on Earth surface processes, sedimentary systems, and sedimentary rocks. The rock cycle and plate tectonic theory are briefly surveyed at the beginning of the term. Emphasis topics include: sedimentary rocks, sedimentary processes, stratigraphy / time, rock weathering, mass wasting, rivers, groundwater, glaciers, climate change, deserts, and coastal processes.

This is a writing-intensive course that is designed for students who have an interest in Geology, need to fulfill the LACC or writing-intensive requirements, or who plan to major in Earth Science. Course content will generally be qualitative in nature, although basic mathematical skills (through algebra) will be reviewed and utilized to complete the lab exercises. Creative instructor-student interaction will be faithfully encouraged to provide a truly relaxed educational atmosphere.

**REQUIRED TEXTS**

Marshak, S., 2012, **Essentials of Geology (4th Edition)**: Norton & Company, Inc., 648 p. ISBN 978-0-393-12432-3.

Busch, R.M., ed., 2015, **Laboratory Manual in Physical Geology, 10th ed.**: American Geological Institute and National Association of Geoscience Teachers, Pearson, 384 p. ISBN-13: 978-0321944511.

**CLASS NOTES**

A comprehensive set of instructor class notes are available for download via the internet. The class web site is at **URL <http://www.wou.edu/taylor>** ... scroll down the course list and click on the link to the "ES202" home page.

The class notes are available as Adobe Acrobat Reader files (\*.pdf file). Acrobat Reader is free and is installed on many campus PC's. For home installation, Acrobat Reader is also available for download at <http://www.adobe.com>

Based on prior student suggestions, I have assembled my class notes and made them available. These notes are required for the class, and may be freely printed at any campus internet station (e.g. ITC Bldg - Student Lab, Library, local department computer labs). **YOU ARE REQUIRED** to have a copy of the notes by class time during the appropriate week / lecture subject.

I will have the notes on the multimedia projector during lecture. All you have to do is listen, augment notes, and make drawings as I discuss a particular concept. You will not have to "take notes" in the sense of the traditional lecture format, but you will have to pay attention if you want to succeed. It is imperative that you get a copy of the notes, since I will not be allowing time for students to hand copy them during class. The notes are in outline form and are very comprehensive.

## OTHER REQUIRED MATERIALS

Students will also need a scientific calculator, ruler, protractor, colored pencils, and frequent access to a personal computer connected to the internet. You will be required to use these materials during labs and exams. Lab materials will be available as needed. Please plan accordingly.

## EVALUATIONS AND EXPECTATIONS

Student performance will be evaluated on the basis of quizzes, exams, lab exercises, homework, and a term paper. The following is a breakdown of evaluation points and letter grades:

Quizzes (2 x 25 pts ea)	50 pts	11%
Mid-Term Exam	100 pts	23%
Final Exam	125 pts	28%
Term Paper	35 pts	8%
Lab Exercise Portfolio (10 labs x 9 pts ea)	90 pts	21%
Homework Questions (8 x 5 pts ea)	40 pts	9%
Total		440 pts 100%

### Final Grading Scale

Percent Range of Total Points	Letter Grade	Percent Range of Total Points	Letter Grade
94-100%	A	77-79%	C+
90-94%	A-	73-76%	C
87-89%	B+	70-72%	C-
83-86%	B	67-69%	D+
80-82%	B-	63-66%	D
		60-62%	D-
		<60%	F

**Class and Homework Assignments:** There are two types of homework assignments used in this class: (1) "in-class" exercises and (2) "online homework". The in-class exercises will be assigned by the instructor during the lecture period and may include written exercises, pop-quizzes, video review sheets, or other types of assessment tools. In-class work may be assigned to take home or submitted at the end of the period. Online homework assignments are designed as internet-based "take-home" exercises that are submitted electronically by the prescribed due date. Late assignments will not be accepted after the deadline. Special arrangements for turning in late assignments with administrative excuses should be arranged in advance.

**Exams and Quizzes:** Exams and quizzes will consist of material covered both in lecture and lab periods. Quizzes will be administered once before the mid-term, and again between the mid-term and final. Quizzes are designed to keep the students abreast of their weekly studies, in preparation for the mid-term and final exams. Studying for quizzes is an excellent way to avoid last minute "exam cramming" and poor exam performance.

The final exam will be comprehensive with test material drawn from throughout the term, but will focus mostly on the material covered after the mid-term. Exams and quizzes will generally be a mix of objective questions (e.g. multiple choice, matching, true/false, completion), essay questions, and lab-style problems. Geology is a very visual, 3-dimensional science. *Be forewarned that you will be expected to include sketches and drawings in your essay answers!*

**Exams and Scantron Erasure Mark Policy:** Portions of the class exams may involve use of "scantron" answer sheets. Scantron erasure errors are common in instances where students do not effectively erase all unwanted pencil marks from the answer sheets. Erasure "shadow" marks can result in scantron mistakes with erroneous point subtraction and grade errors. The instructor commonly deals with erasure errors on a case by case basis. One or two erasure errors per exam are no problem and are commonly corrected on the spot. In instances where students claim greater than three scantron erasure errors, the instructor reserves the right to request that the student retake the exam in its entirety.

**Term Paper:** A term paper will be assigned by the instructor during the course of the term. Students will select a relevant topic at that time. Specific topics, methodology, and formatting will be prescribed by the instructor.

**Lab Exercise Portfolio:** The lab exercises represent a significant component of the class. Exercises are based on scientific observation, data analysis, and problem solving. Students will compile a Lab Portfolio consisting of a well-organized 3-ring binder with completed lab exercises. Students will complete approximately one (1) lab exercise per week of the term. A significant portion of exercises will be completed during lab period, however there will also be independent work required outside of the class (i.e. "homework").

A set of Pre-Lab Reading Questions have been prepared to encourage students to read lab material prior to attending class during any given week. Reading the weekly lab prior to attending class will result in better grade performance and permit the class to run more efficiently, maximizing benefits to all participants. The Pre-Lab Reading Questions are to be completed by the student prior to each week's lab session. Students may use their lab manual and text book to answer the Pre-Lab questions. Questions will be reviewed by the instructor during the lab period, and checked for completeness. The Instructor will return the reading questions to students during the lab period, and the work will be formally included as part of the Lab Portfolio.

The pre-labs and weekly exercises will be organized in a 3-ring binder for review by the instructor. Each week's lab entry will be checked for completeness at the beginning of the next lab period. A weekly check-list will be maintained to reward those students who are responsibly completing the assignment on time. It is important to complete assignments on schedule, as the assignments are designed to help students understand lecture concepts and aid in successfully passing the exams. Lab Portfolios will be checked during class time each week. Refer to the attached sheet "Methodology for Completing Weekly Lab Exercises" for instructions on how to complete labs and organize the portfolio.

Lab answer keys will be posted on the class web site by the instructor. It is your responsibility to: (1) check your work against the lab key, (2) make sure you understand how to complete the exercises, (3) get help from the professor if you have trouble with lab exercises, and (4) study / learn the exercise skills and material for the quizzes and exams.

**Outside Class and Lab Assignments:** Class and lab assignments will be worked BOTH during class time and outside of class time each week. You will have lab, reading, and homework assignments that may take up to several hours to complete. Please plan your schedule accordingly. Late assignments will not be accepted after the deadline prescribed by the instructor. Special arrangements for turning in late assignments with administrative excuses should be arranged in advance.

**Make-up Exams, Make-up Labs, and Incompletes:** Under NO circumstances will make-up exams be administered without prior arrangement (at least three days) and good reason, with a signed administrative excuse. Please show up on exam day!

Lab exercises and demonstrations are set up on a weekly basis. Many of the labs require maps, rock samples, and other materials prepared by the instructor. As such, the lab materials will be set up and broken down on a weekly basis. Under NO circumstances will make-up labs be administered without prior

arrangement (at least three days) and good reason, with a signed administrative excuse. Please show up during your assigned lab period. Switching weekly lab periods must be approved by the instructor, prior to attending lab.

Under **NO** circumstances will a grade of "incomplete" be issued in the last week of class. If you find yourself in a situation where you can't complete the required course work, please make arrangements with the instructor prior to the last week of class. Contact the Student Affairs Office (838-8365) for assistance in arranging incompletes.

**Learning Resources and Grade Outcomes:** The class knowledge base will be derived from a combination of the following: (1) independent student reading outside of class; (2) independent student engagement of take-home lab exercises and quantitative problem solving; (3) independent student reading of web resources linked from the class web site; (4) systematic review and memorizing of class notes and ancillary reading materials, as directly linked from class web site and handed out in hard copy during class time; and (5) successful attendance, note taking, and engagement of in-class lectures/labs delivered by the instructor. Instructor lectures are designed as interpretive translations to assist students in understanding the class content and to stay on track with the weekly schedule. Lectures are not intended as the primary knowledge transfer mechanism. Independent student engagement of readings, class notes and lab work outside of class time is the most important pathway to success.

## **ATTENDANCE AND ASSIGNMENT POLICY**

There is a direct correlation between attendance and student performance. Attendance is necessary for students to properly digest intellectual concepts presented in a college classroom format. The in-class assignments are designed to reward students who attend class on a regular basis. Absences with written excuses for medical reasons or university-related functions may be used to arrange make-up work with the instructor. As with incompletes, contact the Student Affairs Office to arrange for written excuses (838-8365).

## **STUDENT HONOR POLICY**

Plagiarism and cheating will not be tolerated. Cheating includes copying others work and using cheat sheets on exams. However, students are encouraged to interact in small groups during lab exercises and class assignments. Specifically, you are encouraged to discuss concepts and ask questions of your student colleagues, but you may not directly copy their work. Cases of cheating and plagiarism will be referred to the appropriate university administrative office.

### **Plagiarism and Writing**

A significant component of research papers involves incorporating others written work into your product. There is a right way and wrong way to approach using others work. The wrong way includes directly copying text from a source, without recognizing where the information originated (this includes internet web sites!!!). In doing this, you are violating federal copyright laws and are being a lazy slouch who can't think for him/her self.

The methods of "paraphrasing" and "author citation" are the best way to avoid direct plagiarism when writing a term paper. The paraphrasing method involves: (1) reading the original work, (2) taking notes on the key terms and concepts, and (3) re-organizing and re-wording the work in your own voice. The author citation method allows a writer to use other's ideas and work, on one critical condition, that the writer cites and recognizes the original author's contribution. Information sources that require paraphrasing and author citation include: text books, journal articles, government publications, internet web sites, encyclopedias, magazines, and newspaper articles. Plagiarism on term papers can be readily avoided by using the paraphrasing and author citation methods. Directly copying other's written material will be considered "cheating" and will be referred to the university administration for disciplinary action (**this specifically includes directly copying text from web sites**).

## **STUDENTS WITH DISABILITIES**

Any student who has a disability that requires accommodation, please make an appointment to see me.

## **A NOTE ABOUT THE LAST WEEK OF CLASS**

Given that the Oregon University System employs the "quarter-method" of academic scheduling, upper division courses are by nature "compressed" with much detailed content to cover in a relatively short period of time. As such, the 10th week of class is as critical to content coverage as the 1st week. Students should anticipate a full slate of "normal" activities during the last week of class, including lectures, lab exercises, quizzes, written reports, etc. The term "dead week" simply means that comprehensive Final Exams are not to be given week 10, unless if agreed upon by the instructor and students. All other activities such as lectures, labs, assignments, paper writing, quizzes etc. are fair game during "dead week". The class is not over until after the final exam in week 11! Plan your schedule accordingly!

## **A NOTE ABOUT LOST OR MISSING WORK**

The instructor will only grade work that is received and physically visible. Any missing work (lab assignments, homework, quiz/test answer sheets) will receive a "0" on the grade sheet. This policy applies to work lost by the student or instructor. If the student demonstrates that the work was turned in, but is missing due to the instructor's incompetence, then the student will be afforded an opportunity to make up the work and resubmit it for graded credit. Otherwise, the student will not receive credit for lost or missing work.

## **CHANGE OF SYLLABUS - POP QUIZZES - UNANNOUNCED HOMEWORK ASSIGNMENTS**

The instructor reserves the right to modify the syllabus and class schedule at any time during the term. Students will be notified of such changes in a timely manner. The instructor also reserves the right to administer pop-quizzes and assign unscheduled homework / class assignments at any time. All students will be responsible for completing this work and it will comprise part of the final class grade.

## **FREQUENTLY-ASKED QUESTIONS ABOUT GRADES, STUDY TECHNIQUES AND TUTORING**

*What can I do to pass the class and receive a good grade?* If you want to successfully complete this class and maximize your grade standing, the following techniques are recommended: (1) read your notes before coming to class, (2) attend lecture every day, (3) complete all of the in-class exercises, homework, and lab assignments, (4) read the book weekly, and (5) incrementally study your notes weekly (do not wait until the last minute before the exam).

We will be covering a large volume of material throughout the term. The best approach for success is constant and steady interaction with the course materials. The lectures are designed to provide you a simplified explanation of complex scientific concepts, and present contextually-relevant, real-world examples that will help you comprehend the material. Hence, to benefit from the lectures, you will need to attend class on a regular basis. The class assignments provide an opportunity for self-discovery and interaction with the material, this will help you assess your ability to comprehend and understand the concepts. In addition, the class and lab assignments provide critical "effort points" that will raise your exam and quiz averages. Repeat after me: "the homework is my friend, the homework is my friend, the homework is my friend, please give us extra homework". Developing a weekly study schedule and work ethic will enable you to incrementally build a scientific knowledge base and data dictionary from which to successfully answer exam and quiz questions.

*Why is reading the book important for successfully completing exams and quizzes?* The online class notes are provided in a bulleted, summary format. These were developed by the professor over many years and provide the framework for organizing lecture materials. The lectures are delivered in an informal style with emphasis on contextual relevancy and conceptual visualization. The "disconnection" occurs at exam time, as the questions are written with formal scientific language and terminology. The initial step in correctly answering an exam question, is to first understand the scientific language and what the question is asking. The latter steps involve memory recall, visualization, and interactive comprehension of the scientific concepts. Given that the notes and lectures are organized in a style that differs from the written exam language, reading the book is essential for learning the formal language of science, that which is prerequisite for successful test taking.

*I have followed all of your recommendations, and I still score poorly on quizzes and exams, what more can I do?*

The Learning Center at WOU is available for students to receive additional help and guidance in successfully completing classes. Services include peer-to-peer tutoring, study skills workshops, testing strategies, study-group organization, and structured facilitation. The Learning Center is located in Room 401 of the Academic Programs and Support Building across the street from Natural Science. Contact them at 838-8428. In addition to the Learning Center, the Office of Disability Services is available to help students who may have learning disabilities. Their number is 838-8250, call to make an appointment for an initial disability assessment.

**TENTATIVE COURSE OUTLINE:** This outline should be considered tentative at best. The following schedule may be modified as class ideas evolve throughout the semester.

Abbreviations for Reading Assignments are as Follows: M = Marshak, **Essentials of Geology 3<sup>rd</sup> edition**; AGI = Laboratory Manual in Physical Geology 10<sup>th</sup> edition; "Handouts" = from professor.

<u>Week</u>	<u>Dates</u>	<u>Class Content</u>	<u>Reading Assignment</u> (author / page)	<u>Lab Exercise</u>
1	Jan 4,6,8	Class Policies, Introduction, Overview of Earth	M: p. 1-8, Chap 1 M: Appendix A Lab: Handouts	Lab 1: Overview of Scientific Methods / Techniques-Take Home
<b>Lab 1 Take-Home Assignment; NO FORMAL LAB MEETING WEEK 1; Lab Classes Begin Week 2</b>				
<b>Homework assignment – Week 1: Print out all of the course notes available on the class web site and organize them in a three-ring binder. Class note binders will be checked during the Week 2 Lab Session.</b>				
2	Jan 11,13,15	Overview of Tectonics, Matter, Minerals, Rocks	M: Chap 2-3, p. 93-109 M: p. 175-183 Lab: AGI p. 31-95	Lab 2: Review of Minerals, Rocks, and Tectonics
3	Jan 20,22	Sedimentary Processes, Matter, Minerals, Rocks	M: p. 138-139, Chap 6 Lab: AGI p. 127-135	Lab 3: Sedimentary Rocks
<b>NO CLASS JANUARY 18 - Martin Luther King Day</b>				
4	Jan 25, 27, 29	Sedimentary Rocks II, Stratigraphy, Time	M: Chap 6, 10 Lab: AGI p. 127-135 Lab: AGI p. 136-154	Lab 4: Intro to Sedimentology and Stratigraphy
<b>Quiz 1 Monday January 25</b>				
5	Feb 1,3,5	Weathering, Soils, Mass Wasting	M: p. 138-150, Chap 13 Lab: AGI p. 195-226	Lab 5: Topographic Maps and Aerial Photographs
6	Feb. 8,10,12	Fluvial Processes and Landforms	M: Chap 14 Lab: AGI p. 249-272	Lab 6: Fluvial (River) Systems/Landforms
<b>Mid-Term Exam, Monday Feb. 8; Feb. 12 – Last Day to Drop W/o Grade Penalty</b>				
7	Feb. 15,17,19	Groundwater	M: Chap 16 Lab: AGI p. 273-292	Lab 7: Groundwater
8	Feb 22,24,26	Glaciers, Glacial Processes, Climate Change	M: Chap 18, 19 Lab: AGI p. 293-316	Lab 8: Glacial Systems, Climate
<b>Cyber Friday February 26: No In-Person Lecture Meeting; Web-Based Assignment</b>				
9	Feb 29, Mar 2,4	Deserts, Eolian Processes, Desert Landforms	M: Chap 17 Lab: AGI p. 317-332	Lab 9: Desert Processes/Landforms
<b>Quiz 2 Monday Feb 29</b>				
10	Mar 7,9,11	Oceans, Coastal Processes, Coastal Landforms	M: Chap 15 Lab: AGI p. 333-348	Lab 10: Coastal Processes/Landforms
11	Mar 14-18	<b>Finals Week (FINAL EXAM - Check Schedule)</b>		

## Homework Assignments / Web-Based Practice Quizzes

The homework assignments are designed as online exercises using your textbook, the internet, and campus software called "Moodle". I have prepared a set of online, fill-in-the-blank homework questions that are keyed to chapter readings in your textbook. By using the Moodle software, your homework exercises are administered and graded online. This eliminates much paperwork on my end, and makes your homework seem more like a video game (which makes it slightly more enjoyable for both of us). Individual weekly homeworks will be available for one week at a time throughout the term. **You will only be able to complete and submit the assigned online homework during the availability time. If you miss the deadlines you will receive a "zero" for the homework. Pay attention to the dates listed below!**

**The following are procedures for accessing the online homework assignments:**

- (1) You will have an individual student account set up on Moodle with a username and password.
- (2) The Moodle website may be accessed in the following ways:
  - (a) from the class homepage (www.wou.taylor ... follow the links to ES202 ... then follow the links to "Moodle" in the Homework Assignments section), or
  - (b) by surfing to the following URL in your web browser: **moodle.wou.edu**
- (3) Once at the site, go to the "Login Box" at the upper right corner of the page.
- (4) Enter your WOU Email student username- **This will be the same as your student server username.**
- (5) Enter the last 4 digits of your student ID number for the password. **Your password will be the last 4 digits of your "V no.", just like your student server account, until you change it.**
- (6) Once you are logged in, look for the "Change Password" icon... you can change your password at any time!
- (7) Click on the "Homework Assignment" icon.
- (8) Click on the homework assignment you wish to complete, and begin the online assignment.
- (9) **For each question, type in an answer in the blank box provided and click on the "save answer" radio button. When finished with all questions in the homework, click on "Finish". IF YOU DON'T SEE YOUR "HOMEWORK GRADE" AFTER YOU SUBMIT, THEN YOU DID NOT FOLLOW THE ABOVE INSTRUCTIONS. REMEMBER TO "SAVE ANSWER" FOR EACH QUESTION AND "FINISH" WHEN YOU HAVE COMPLETED THE HOMEWORK.**
- (10) You may stop and begin the assignment as many times as you wish, but only until you click "submit for grading".
- (11) **Make sure you print a hard copy of your homework answers and/or save them as a file on your local drive! The print out will be your hard-copy record that you completed the work. IF YOU DO NOT SAVE A HARD COPY OF YOUR WORK, AND THE COMPUTER RECORDS IT AS "0" THEN YOU WILL RECEIVE A "0"... SAVE A HARD COPY OF ALL YOUR WORK AS A BACK-UP RECORD.**
- (12) Homework assignments will be posted and open on a weekly basis. This is a standing homework assignment and it is your responsibility to check in every week and accomplish the task. Pay attention to the deadlines, the instructor will not be reminding you, this will be on "auto pilot".

**Note:** Pay attention to the availability dates, once the deadline has passed you are out of luck! You have unlimited time and an unlimited number of tries to correctly answer and submit the questions. Your highest score will be recorded as the grade.

**Note:** Print a hard copy of your questions and answers from the browser icon... this will be your written record of completing the assignment! It will also serve as a study guide with practice questions that will be on the exam.



**Tips and Tricks for Completing the Online Homework:**

- (1) Read the text chapter in question before you start. The text readings are listed on the schedule above.
- (2) Log-on to Moodle and print out a copy of the homework questions.
- (3) Answer the questions on paper with your textbook, prior to working and submitting them online.
- (4) Log-on to Moodle and finish the online assignment.
- (5) Print a copy of your completed online homework, this is your hard-copy record that you completed the assignment (remember - if there is a way for a computer to make a mistake, it will happen to you!).

**Homework Assignment Schedule**

No.	Topic	Marshak Text Chapter(s)	Online Availability Dates
1	Minerals, Rocks Tectonics	Chap 1,2,3,4	01/04/16 - 01/15/16
2	Sedimentary Rocks Geologic Time	Chap 6, Chap 10	01/15/16 - 01/22/16
3	Weathering / Mass Wasting	Interlude B, Chap 13	01/22/16 - 01/29/16
4	Rivers	Chap 14	01/29/16 - 02/05/16

*Note: No Homework the Week of Feb. 5-Feb 12; Midterm Exam*

5	Groundwater	Chap 16	02/12/16 - 02/19/16
6	Glaciers	Chap 18	02/19/16 - 02/26/16
7	Deserts	Chap 17	02/26/16 - 03/04/16
8	Coasts	Chap 15	03/04/16 - 03/11/16

**Marshak Essentials of Geology 3<sup>rd</sup> and 4<sup>th</sup> Edition Chapter Content Comparison**

	Marshak 3 <sup>rd</sup> Edition		Marshak 4 <sup>th</sup> Edition	
Earth in Context/Solar System	Chap. 1	p. 9-32	Chap. 1	p. 9-34
Plate Tectonics	Chap. 2	p. 33-67	Chap. 2	p. 35-60
Minerals	Chap. 3	p. 68-84	Chap. 3	p. 71-87
Rocks Overview	Interlude A	p. 85-91	Interlude A	p. 88-96
Igneous Rocks	Chap. 4	p.92-110	Chap. 4	p.97-118
Volcanism	Chap. 5	p. 111-137	Chap. 5	p. 119-147
Sediment Overview	Interlude B	p. 138-151	Interlude B	p. 148-162
Sedimentary Rocks	Chap. 6	p. 152-174	Chap. 6	p. 163-188
Metamorphic Rocks	Chap. 7	p. 175-193	Chap. 7	p. 189-209
Rock Cycle	Interlude C	p. 194-199	Interlude C	p. 210-216
Earthquakes	Chap. 8	p. 200-231	Chap. 8	p. 217-251
Earth Interior	Interlude D	p. 232-239	Interlude D	p. 252-264
Mountain Building	Chap. 9	p. 240-265	Chap. 9	p. 265-291
Fossil Record	Interlude E	p. 266-275	Interlude E	p. 292-304
Geologic Time	Chap. 10	p. 276-297	Chap. 10	p. 305-328
Earth History Overview	Chap. 11	p. 298-p.320	Chap. 11	p. 329-352
Energy and Mineral Resources	Chap. 12	p. 321-350	Chap. 12	p. 353-385
Hydrologic Cycle	Interlude F	p. 351-360	Interlude F	p. 386-396
Landslides/Mass Wasting	Chap. 13	p. 361-377	Chap. 13	p. 397-416
Rivers	Chap. 14	p. 378-403	Chap. 14	p. 417-444
Oceans/Coasts	Chap. 15	p. 404-429	Chap. 15	p. 445-472
Groundwater	Chap. 16	p. 430-450	Chap. 16	p. 473-496
Deserts	Chap. 17	p. 451-468	Chap. 17	p. 497-514
Glaciers	Chap. 18	p. 469-498	Chap. 18	p. 515-544
Global Climate Change	Chap. 19	p. 499-518	Chap. 19	p. 545-568