



TEXAS CHIROPRACTIC COLLEGE  
Department of Chiropractic Principles, Technique, and Biokinetics

Spring 2012

**COURSE TITLE:** Spinal Biomechanics

**COURSE NUMBER:** CH2220

**COURSE HOURS:** 2 Lecture hours per week  
(Monday, 1300-1400h, L-205; Thursday, 1400-1500h, L-205)

**COURSE CREDITS:** 2

**CONTACT INFORMATION:**

*Course Professor:* Shari Wynd, DC, PhD

*Office:* Iwama Building, Room 220

*Office Hours:* Mon (1200-1300h), Tues (1300-1500h), Wed (1000-1200h), Thurs. (1100-1300h)

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*Edvance 360 Addresses:*

<http://edvance360.com/txchiro/>

*Course Packs:*

Required journal articles are posted on Edvance 360.

**COURSE MATERIALS:**

Students will be responsible for all material covered in lecture. Lecture notes will be made available before the scheduled class. In addition to lecture material, students will be responsible for the information contained within the assigned readings from the required text and journal articles (available in the library). While this material may not be covered specifically in lecture, the information is considered important background information and as such students will be expected to learn this material and be tested on this material. All material taught in this course is cumulative. For example, a student must remember the origins and insertions of specific muscles in order to understand the biomechanical effect of an injury to a muscle.

***Required Text:***

Kapandji IA. The Physiology of the Joints, Vol.3 (6<sup>th</sup> Ed), New York: Churchill Livingstone, 2008.

Peterson, DH and Bergmann, TF. Chiropractic Technique: Principles and Procedures, (2<sup>nd</sup> Ed). St. Louis, MS: Mosby, 2002.

***Recommended Texts:***

Bogduk N. Clinical Anatomy of the Lumbar Spine and Sacrum, 4th ed. New York: Churchill Livingstone, 2005.

Nordin M & Frankel VH. Basic Biomechanics of the Musculoskeletal System, 3<sup>rd</sup> ed. Philadelphia: Lippincott Williams & Wilkins, 2001.

White A & Panjabi M. Clinical Biomechanics of the Spine, 2<sup>nd</sup> ed. Philadelphia: Lippincott, 1990.

Whiting, WC and Zernicke, RF. Biomechanics of Musculoskeletal Injury, (2<sup>nd</sup> Ed). Champaign, IL: Human Kinetics, 2008.

***Required Readings:***

Students will be breaking up into small groups (2 to 3 people). They will then select a journal article from the list of articles provided by the professor. Journal articles will need to be distributed 1 week before the assigned discussion date. All students will be responsible for the material covered by the journal article presented by the group. Article presentation will involve: a summary of the articles subject matter, a critical evaluation of the quality of the article, and a discussion about the usefulness of the article in making clinical decisions.

**COURSE DESCRIPTION:**

This course presents a detailed analysis of the anatomy, normal biomechanics, and pathobiomechanics of the spine and pelvis and how they relate to common clinical problems. Correlations will be made to various clinical presentations using computer case-based program and instructor presentation of cases. The cases will emphasize clinical presentations related to Spinal Biomechanics with contributions from other courses in the curriculum when appropriate.

**PRE-REQUISITES:** Gross Human Anatomy and Embryology I (AN 1746), Spinal Anatomy (AN 1330)

**COURSE COMPETENCIES:**

<i>CCE Clinical Competencies</i>		<i>TCC Clinical Competencies</i>	
Physical Examination	Chiropractic Adjustment or Manipulation	Evidence Based Practice / Research	Physical Therapeutic Procedures
Neuromusculoskeletal Examination	Diagnosis	Communication	Special Populations

**LEARNING OUTCOMES:**

- Integrate knowledge of spinal biomechanics with different clinical presentations.
- Demonstrate the relevance of spinal biomechanics to clinical application.
- Acquire requisite spinal biomechanics knowledge as a foundation for clinical reasoning.

### **LEARNING OBJECTIVES:**

1. Recall the functional anatomy (bones, muscles, ligaments) of each region of the spine.
2. Describe the structure and function of the intervertebral disc using biomechanical terminology
3. Describe spinal osteokinematics and osteokinetics using specific anatomical planes and axes.
4. Describe the spinal arthrokinematics and arthrokinetics for each region of the spine (Lumbosacral, thoracic, and cervical)
5. Analyze the osteokinematics of each region of the spine and discuss how various clinical presentations will affect normal biomechanical functioning
6. Analyze the kinematics of each region of the spine and discuss how various clinical presentations will affect normal biomechanical functioning
7. Analyze the joint structure of each region of the spine and discuss the force vectors that must be applied in order to move the joint.
8. Analyze joint angle displacement, velocity and acceleration curves to determine normal and pathological osteokinematics.
9. Discuss the biomechanics of joint injury using concepts of a material's property (i.e. Young's Modulus).
10. Analyze stress/strain (load/elongation) curves to determine material's properties
11. Discuss the time and rate dependency of viscoelastic materials.
12. Compare stress relaxation to creep and discuss their clinical relevance
13. Describe some of the mechanical and neurophysiologic effects of spinal manipulation
14. Perform biomechanical assessments of movement (i.e. bending, lifting, sitting, playing a sport, etc.)

### **TEACHING PHILOSOPHY:**

My job as a professor is to help students develop a comprehensive understanding of spinal biomechanics. I will endeavor to provide the students with up-to-date material that is relevant to their development as clinicians. Understanding biomechanics is essential to the art and science of chiropractic. Through this introductory course, students will become familiar with basic biomechanical concepts that can then be integrated into their clinical reasoning skills. My lectures will be based on my expertise in the area of biomechanics and from the required readings. My goal as a professor is to encourage students to be lifelong learners. As such, I will expect students to read all required chapters and journal articles. Examinations will include questions from these readings.

### **TEACHING METHODS:**

Interactive lectures and

Case presentations during lecture to show the relevance between the basic and clinical sciences

Small group activities (Journal discussion)

Independent learning (required reading from current literature)

### **STUDENT RESPONSIBILITIES**

It is your responsibility to attend at least 90% of the lectures (as per school policy); however, missing lectures may mean a missing a pop-quiz or a key concept that I will highlight in the lecture that may not be in your textbook and/or required readings. You will be responsible for signing in for attendance. If you think that you are close to missing 10% of your classes, you should check with the professor to see how many absences you have accrued. I have outlined the chapters you will be responsible for in the following course outline. You will be responsible for all assigned readings - this means that this material will be covered in midterms and/or finals. To enhance your learning experience, you should prepare before class. Class participation in small group activities and in-class discussions is expected. Participation should be done in a positive manner for the learning process. At all times the students will be expected to demonstrate respect for your peers and your instructor. If at any time you do not understand the material that is being presented, or you need to review quiz or test material, please contact me during my office hours, immediately after class, or by email to set up an appointment.

Participation:	Come to class ready to learn.
Homework:	Review notes, required readings, assigned textbook chapters
Quizzes/Exams:	Four Exams (Three in-class tests, One final) Best three out of five quizzes (8.33 points each) Participation in group presentation (individually graded)

### **GRADING METHOD AND SCALE (pg 49):**

Statement on the Assessment Process and Measurements:

Exams will contain diagram labeling, short answer, and essay questions. They will be graded according to the school standard:

90 - 100	= A
80 - 89	= B
70 - 79	= C
BELOW 70	= F

### **COURSE GRADING SCHEMA:**

	<b><u>Total Points</u></b>	
Student Group Project (presentation of journal article)	25	(11%)
Quizzes (three "pop" quizzes, 8.33 points each)	25	(11%)
Midterm exams (three exams, 25 points each)	75	(34%)
Final Exam (Cumulative)	100	(44%)
<b><u>Total</u></b>	<b>225 points</b>	<b>(100%)</b>

\* A total of 5 quizzes will be given, the best 3 will be used to calculate your final grade.

\*\*Please note that final grades will be rounded to the nearest whole number. For example, a final score of 157 points out of 225 is 69.6%, which will be rounded up to 70% (the minimum score required to pass the course).

### **METHOD OF ASSESSMENT**

Students will be assessed in several different manners: Pop quizzes, written tests, and presentations.

#### ***Quizzes:***

Quizzes will be short answer and/or descriptive essay questions. Quizzes will be open book based on previous lecture concepts; however, **ONLY** a personal "study sheet" (hand written notes and diagrams on a single 8.5x11 sheet of paper) will be allowed. **Computer-generated notes will not be permitted.** (not notes directly written on PowerPoint lecture slides or notes distributed by other individuals). The "study sheet" will be viewed by the professor prior to commencing the quiz. The professor reserves the right to disallow a "cheat sheet" if there is suspicion that the sheet is not the student's own work.

#### ***Midterms and Final:***

Midterms and final exams will be a composite of short answer, diagram labeling, and essay questions. Tests will be given at the end of each section and are not cumulative. The final is cumulative. Material from lectures, assigned readings, and student presentations will be considered "testable" material. Your final grade is your final grade. If you score an 89.5 you will get an "A" in the course. If you score an 89.2 you will get a "B" in the course. Please **do not** ask me if you can do extra credit to raise your score.

#### ***Test Review Policy:***

Students have **2 weeks** to review your test from the day the grade is posted. After that you may not review your test. Test review must be done in a professional, non-confrontational manner. If at any time during the review, a student is deemed to be acting unprofessionally, the review session will be ended.

Students who do not obtain a score of 70% or better **must** review their test, and perform remedial exercises to ensure that key concepts have been learned. There is no grade associated with the remedial exercises; however, students who complete these exercises should have an easier time preparing for the final exam (which is cumulative).

#### ***In-class group presentations:***

Since good communication skills are a competency that a TCC graduate must possess, the student's ability to communicate will be assessed through in class presentations. In class presentations will be done as a group (2-3 students maximum), and the topic will be determined by the group's choice of article. PowerPoint slides, visual aids, handouts, and demonstrations will be expected throughout the presentation. While presentations will be a group effort, students will be graded individually according to a rubric that will be available to the students before they present. Presentations will occur during Lab Finals week. Sign up for your topic will occur in the first week of classes. Topic assignment will be on first come first serve basis.

Please note: In fairness to the students who present earlier in the term, grades for each group will not be provided until the last group has presented. Details on the contents, duration and grading scheme will be provided in a separate "Project Outline".

**Example Test Questions:**

Contrast and compare the lumbar vertebrae to the cervical vertebrae. Be sure to discuss anatomical differences, primary movement patterns, and specific function of the surrounding musculature.

(Essay question)

Define stress relaxation and provide an example to illustrate how it affects tissue mechanics. (Short answer)

Which ligaments act as brakes for nutation?

**TEST BLUE PRINTS:**

Test blue prints are provided for the student so that they may allocate the appropriate amount of time to understanding the key concepts that they are expected to learn for the test. Students should be advised that all lecture material is testable material.

**Total Available Test Points: 25**

**1. Definitions (as provided in the lecture and/or required readings): 10 points (40%)**

***Skill level:*** Basic (memorization)

***Example question:*** Define kinematics. (2 points)

***Answer:*** Kinematics is the study of the movement of a body without reference to the forces that created the motion.

***Rubric:***

0 points: No reference or incorrect reference to the requested definition.

1 point: Correct reference to the requested definition but missing some key component of the question.

2 points: Correct reference to the requested definition including all key elements presented in the reading and/or lecture material.

**Total questions of this type on the test: 5**

**2. Contrast and compare: 10 points (40%)**

***Skill level:*** Intermediate (utilization of knowledge)

Example: What is the difference between osteokinematics and arthrokinematics?

Answer: Osteokinematics is the study of the relative motion between two body parts. Joint shape, muscle length and strength, and ligament structure will have an influence on the observed motion. An example of this type of study would be the range of motion tests used during orthopedic assessment of the knee. Arthrokinematics is the study of the movement between two joint surfaces. Joint shape and ligament integrity are considered the primary determinants of the observed motion. An example of this type of study would be the assessment of movement between two vertebrae during motion palpation.

Rubric:

0 points: Incorrect explanations and/or inability to compare items.

1 point: Partially correct explanations with no demonstration of the ability to compare items.

2 points: Partially correct explanations with poor demonstration of ability to compare items. (Lack of detail and/or examples)

3 points: Correct explanations with moderate demonstration of the ability to compare items. (Details present but lacking accuracy and/or no examples)

4 points: Correct explanations with good demonstration of the ability to compare items. (Details present and accurate but no examples)

5 points: Correct explanations with excellent demonstration of the ability to compare items. (Details present and accurate with examples)

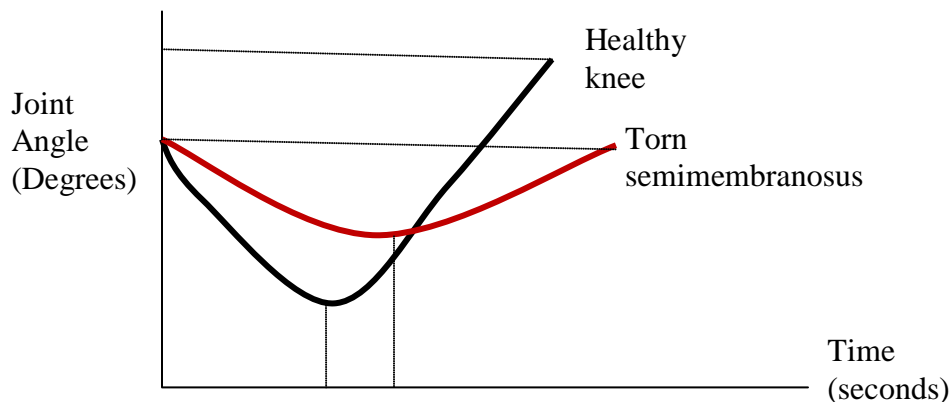
Total questions of this type on the test: 2

3. Analyze/derive and explain your answer: 5 points (20%)

**Skill level:** Advanced (integration of knowledge, clinical reasoning)

**Example:** Draw a joint-angle displacement curve for a healthy knee during the swing phase (from toe-off to heel strike) of the gait cycle. (3 points) Draw a second joint angle-displacement curve demonstrating what would be expected to occur if the semimembranosus tendon was torn. Explain your answer. (2 points)

**Answer:**



During the swing phase, the healthy knee flexes maximally to approximately 60 to 85 degrees (at approximately mid-stance for the opposite leg). At toe off, the healthy knee is flexed to approximately 130 degrees; however, at heel strike, the knee is fully extended (at approximately 180 degrees). Concentric contraction of semimembranosus is required to flex the knee during the swing phase. When the semimembranosus is torn, the ability of the hamstrings to generate the required knee flexion is impaired, resulting in a decreased maximal flexion angle. The pain associated with stretching of the injured hamstrings will also cause inhibition of extension, so the knee will likely not extend completely at heel strike. Finally, since the muscle is injured, it will likely be unable to generate sufficient power to move the knee as quickly when compared to the healthy knee. This will result in a slower swing phase (as indicated by the shift of the curve to the right).

**Rubric:**

- 0 points: Incorrect analysis.
- 1 point: Analysis incomplete/inaccurate and no explanations provided.
- 2 points: Analysis incomplete/inaccurate and some explanations provided.
- 3 points: Correct analysis with marginal or inaccurate explanations
- 4 points: Correct analysis with some explanation; however, key elements remain unexplained.
- 5 points: Correct analysis with complete and accurate explanations

**Total questions of this type on the test: 1**

A written examination requires a different type of studying. Clearly, biomechanical concepts must first be memorized before they can be used in higher order thought processes. Course concepts should be reviewed regularly so that they are not new concepts at the time of the examination.

The written examinations are designed such that it should be possible to get 80% by memorization and utilization of the course key concepts. The remaining 20% of the test score will require a deeper understanding of the course material and therefore will represent a significant challenge to students who still struggle with the key concepts. Students who comprehend the key concepts will also be challenged; however, through logical thought processes, the correct answer will be possible. Written examinations help the student to develop the clinical reasoning skills that they will need for practicing as a Doctor of Chiropractic.

Written examinations are a new concept for students so it is imperative that students practice the sample questions that are provided by the instructor. These questions will be interspersed throughout the lectures. Answers to these questions will not be provided; however, the answers will be readily available in either the lecture notes or assigned readings. Students are encouraged to answer these questions completely (as if they would answer them in an examination). Completed questions can be submitted to the instructor for verification of correctness and/or suggestions for completeness.

#### **POLICY INFORMATION:**

**All policy information below can be found in your student handbook. For specific procedures on how each policy is enforced, see the Student Handbook.**

#### **Attendance Policy (pg 55):**

Regular and punctual attendance of all scheduled classes and laboratories is expected. A student is subject to academic penalty if absences exceed 10%. Absences exceeding 20% subject a student to dismissal from a course. **Three incidences of tardiness may constitute an absence.** If justifiable cause can be shown for the absenteeism, the student may be permitted to make up missed assignments and maintain enrollment in the class.

This course is 13 weeks with two contact hours each week and a final two hour exam in the 14<sup>th</sup> week. A total of three absences constitute 10% of this course's allotted time. While efforts to notify students about their attendance status will be made, it is the **student's responsibility** to keep track of their own attendance. The **fifth** absence will be subject to **academic penalty**. On the **sixth** absence, a student will be **dismissed** from the course. Attendance will be taken at the beginning of class. If a student arrives late, it is their responsibility to notify the instructor at the end of class that they were present. Three instances of tardiness will constitute an absence. Student who enter the class after 50% of the lecture material was covered will be marked absent. Students may not leave a lecture (unless there is an emergency). You will not be allowed back into class and will be given an absent on your attendance record. Failure to notify the instructor immediately following class will constitute an absence.

**Missed Examinations (pg 54):**

Students must notify faculty before missing any examination. If an examination is missed for good and sufficient reason and the student has notified the faculty member in advance, a make-up examination may be given subject to a fee of \$40.00. The fee for the make-up examination is a minimum of \$75.00 if a standardized patient is required for the exam. Additional required standardized patient hours may increase this \$75.00 minimum fee. All intra-term examination must be made up prior to final examinations. Missed final examinations must be made up within the first week of the next semester. A student may be allowed a maximum of two missed examination dates for good and sufficient reason per trimester. These two missed examination dates are for all enrolled courses in a trimester, not for each individual course. Any request for additional make-up examinations will require documentation substantiating the absence and must be approved by the Dean of Academic Affairs.

In-class "pop-quizzes" are not subject to this make-up policy. There will be **NO** make-up quizzes.

**Other Classroom Policies**

Professional behavior is expected while the student is in the classroom. As such, the following classroom policies will be in effect:

- 1) Cell phone use is prohibited during class. This includes the sending and receiving of voicemail and/or text messages. Cell phones should be turned off during class.
- 2) Class will begin on the hour and end 10 minutes before the next hour. Sufficient time is therefore allotted for the student to prepare for the next class. Leaving early and/or wandering in and out of class is considered unprofessional and demonstrates disrespect for the learning environment.
- 3) The classroom dress code is casual except for presentations. Students should wear business casual attire for presentations. Please see the Student Clinic Guidelines for what constitutes "Business Casual".
- 4) There will be **NO** use of computers during class time.
- 5) The lectures presented to the students during class time are the property of the professor and of TCC. Digital recording of the lectures will be allowed; however, the recorded lecture material **must** be for personal use. No posting of the recorded lecture is permitted on any web-based community. Sale and/or unauthorized distribution of lecture material will result in disciplinary action.
- 6) Midterms will be held during classroom hours. Students will be expected to leave all of their personal affects at the front of the classroom. Items that are permitted during the examination will be: a pencil, an eraser, a pen, a watch or other time piece. Cell phones will not be permitted on your person during exams. If you require extra time due to a documented disability, you must inform the professor before the exam begins so that special arrangements for you to take the test can be made.
- 7) If you require a dictionary for English translation, you must present it to the professor prior to commencing the exam. The dictionary must not have ANY personal markings or writing in it. No electronic translators will be permitted.
- 8) Student grievances will be dealt with according to the Students Code of Conduct (pg 35).

**COURSE OUTLINE BY WEEK:**

Week	Date	Topic	Reading Assignment
1	Jan 9	<ul style="list-style-type: none"> <li>• <b>NO Class - New Student Orientation</b></li> </ul>	
	Jan 12	<ul style="list-style-type: none"> <li>• Introduction to course; syllabus, course objectives, reading assignments, tests, grading etc.</li> <li>• Divide into groups of 4 to 5 people.</li> <li>• Sign up for presentation date.</li> <li>• Spine Anatomy review</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 1 (Kapandji)</li> </ul>
2	Jan 16	<ul style="list-style-type: none"> <li>• <b>NO Class - Martin Luther King Day</b></li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
	Jan 19	<ul style="list-style-type: none"> <li>• Introduction to Biomechanics <ul style="list-style-type: none"> <li>○ Terminology</li> <li>○ Conventions</li> <li>○ Planes of the body</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 2 (Peterson and Bergmann)</li> </ul>
3	Jan 23	<ul style="list-style-type: none"> <li>• Introduction to Biomechanics <ul style="list-style-type: none"> <li>○ Force vectors</li> <li>○ Application of vectors to understanding movement</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 2 (Peterson and Bergmann)</li> </ul>
	Jan 26	<ul style="list-style-type: none"> <li>• Introduction to Biomechanics <ul style="list-style-type: none"> <li>○ Newton's Laws</li> <li>○ Application of Newton's laws to chiropractic</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 3 (Whiting and Zernicke)</li> </ul>
4	Jan 30	<ul style="list-style-type: none"> <li>• Introduction to Biomechanics <ul style="list-style-type: none"> <li>○ Mechanics of materials (part 1)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 3 (Whiting and Zernicke)</li> </ul>
	Feb 2	<ul style="list-style-type: none"> <li>• Introduction to Biomechanics <ul style="list-style-type: none"> <li>○ Mechanics of materials (part 2)</li> <li>○ Lever systems</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 3 (Whiting and Zernicke)</li> </ul>
5	Feb 6	<ul style="list-style-type: none"> <li>• <b>MIDTERM I - Format: Short answer and essay. Total points = 25.</b></li> </ul>	<ul style="list-style-type: none"> <li>• Refer to Test Blue Print</li> </ul>
	Feb 9	<ul style="list-style-type: none"> <li>• Lower Cervical Biomechanics <ul style="list-style-type: none"> <li>○ Anatomy review</li> <li>○ Osteokinematics</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 5, pg 210- 272 (Kapandji)</li> </ul>

		<ul style="list-style-type: none"> <li>○ Arthrokinematics</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 5 (Peterson and Bergman, pg 152-188)</li> </ul>
6	Feb 13	<ul style="list-style-type: none"> <li>• Biomechanics of lower cervical SMT <ul style="list-style-type: none"> <li>○ Arthrokinematics (review)</li> <li>○ Adjusting procedures</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 5 (Peterson and Bergman, pg 152-188)</li> </ul>
	Feb 16	<ul style="list-style-type: none"> <li>• Upper Cervical Biomechanics <ul style="list-style-type: none"> <li>○ Anatomy review</li> <li>○ Osteokinematics</li> <li>○ Arthrokinematics</li> </ul> </li> <li>• Biomechanics of upper cervical SMT <ul style="list-style-type: none"> <li>○ Arthrokinematics (review)</li> <li>○ Adjusting procedures</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 5 (Peterson and Bergman, pg 152-188)</li> <li>• Chapter 5, pg 190- 209 (Kapandji)</li> </ul>
7	Feb 20	<ul style="list-style-type: none"> <li>• <b>NO class - President's day</b></li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
	Feb 23	<ul style="list-style-type: none"> <li>• Thoracic Spine (TS) Biomechanics <ul style="list-style-type: none"> <li>○ Anatomy review</li> <li>○ Osteokinematics</li> <li>○ Arthrokinematics</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 4 (Kapandji)</li> <li>• Chapter 5 (Peterson and Bergman, 188-233)</li> </ul>
8	Feb 27	<ul style="list-style-type: none"> <li>• Pathobiomechanics of the TS <ul style="list-style-type: none"> <li>○ Scoliosis</li> <li>○ Thoracic spine deformities</li> </ul> </li> <li>• Biomechanics of thoracic SMT</li> </ul>	<ul style="list-style-type: none"> <li>• Article TBD</li> <li>• Chapter 5 (Peterson and Bergman, pg 188-233)</li> </ul>
	Mar 1	<ul style="list-style-type: none"> <li>• Lumbar Spine Biomechanics <ul style="list-style-type: none"> <li>○ Anatomy review</li> <li>○ Osteokinematics</li> <li>○ Arthrokinematics</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 3 (Kapandji)</li> <li>• Chapter 5 (Peterson and Bergman, pg 188-233)</li> </ul>
9	Mar 5	<ul style="list-style-type: none"> <li>• <b>MIDTERM II: Format: Short answer and essay. Total Points = 25</b></li> </ul>	<ul style="list-style-type: none"> <li>• Refer to Test Blue Print</li> </ul>
	Mar 8	<ul style="list-style-type: none"> <li>• Intervertebral disc biomechanics <ul style="list-style-type: none"> <li>○ Structure and composition</li> <li>○ Function</li> <li>○ Arthrokinematics</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 1, pg 20-34. (Kapandji)</li> <li>• Article TBD</li> </ul>

10	Mar 12 through 16	<ul style="list-style-type: none"> <li>• <b>No Class - Student Spring Break</b></li> </ul>	
11	Mar 19	<ul style="list-style-type: none"> <li>• Mechanical and neurophysiological effects of SMT</li> </ul>	<ul style="list-style-type: none"> <li>• Article TBD</li> </ul>
	Mar 22	<ul style="list-style-type: none"> <li>• SI Joint Biomechanics <ul style="list-style-type: none"> <li>○ Anatomy review</li> <li>○ Osteokinematics</li> <li>○ Arthrokinematics</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 2 (Kapandji)</li> <li>• Chapter 5 (Peterson and Bergman, pg 233-282)</li> </ul>
12	Mar 26	<ul style="list-style-type: none"> <li>• Biomechanics of SI Joint Spinal Manipulative Therapy (SMT)</li> <li>• Biomechanical Assessment of the SI and LS spine</li> <li>• Pathobiomechanics of the SI and LS spine</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 5 (Peterson and Bergman, pg 233-282)</li> </ul>
	Mar 29	<ul style="list-style-type: none"> <li>• <b>MIDTERM III: Format: Short answer and essay. Total Points = 25</b></li> </ul>	<ul style="list-style-type: none"> <li>• Refer to Test Blue Print</li> </ul>
13	Apr 2	<ul style="list-style-type: none"> <li>• <b>Design a Case:</b> Biomechanics of Thoracic Spine Injuries</li> </ul>	<ul style="list-style-type: none"> <li>• Article TBD</li> </ul>
	Apr 5	<ul style="list-style-type: none"> <li>• <b>Design a Case:</b> Biomechanics of Lumbar Spine Injuries</li> </ul>	<ul style="list-style-type: none"> <li>• Article TBD</li> </ul>
14	Apr 9	<ul style="list-style-type: none"> <li>• <b>Student Presentations</b></li> </ul>	
	Apr 12	<ul style="list-style-type: none"> <li>• <b>Student Presentations</b></li> </ul>	
	TBA	<ul style="list-style-type: none"> <li>• <b>FINAL EXAMINATION: Format: 2 parts: Part 1 (closed book) Short answer. Part 2 (study sheet) Essay Total Points = 100</b></li> </ul>	<ul style="list-style-type: none"> <li>• Refer to Test Blue Print</li> </ul>



**Confirmation of Receipt and Understanding of Course Syllabus  
Spinal Biomechanics  
(CH2220)**

**FALL 2010**

I, \_\_\_\_\_ have received a copy of the course syllabus and have read and understand its contents.

The professor (Dr. S. Wynd, DC, PhD) has reviewed the key points contained within the syllabus during class time and acknowledge that the verbal review of the syllabus is not meant to replace my own personal review of its contents.

I agree that it is my responsibility to refer to the syllabus for information regarding the test dates and project dates.

I understand that the lecture schedule, as written in the syllabus, may be altered to accommodate the needs of the class to spend more or less time on specific objectives.

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



## Student Honor Code

Faculty Name: Shari Wynd, DC, PhD

Course: Spinal Biomechanics, CH2220

I have read Texas Chiropractic College's policy on Academic Dishonesty as published in the 2008-2010 Student Handbook, understand its provisions, and pledge my honor that I will not violate it.

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Printed Name

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Signature

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Date