**Musculoskeletal Anatomy**
**PED 301 01**

**Instructor:** J. Grant White  
**Office:** Wh 312  
**Ext.:** 1350  
**E-mail:** gwhite@northland.edu  
**Classroom:** Wh 209  
**Lecture/Lab:** 9:00-10:00 MW  
9:00-11:00 TR  
**Website:** [http://www.northland.edu/oe](http://www.northland.edu/oe)


**Texts:**  

**Writing Help:** **Northland Writing Lab:** Gina Kirsten, Composition Specialist, CSE 222, (715) 682-1341, gkirsten@northland.edu

**Please note:** Students in need of academic or medical accommodation should visit the Disabilities Services page of the Northland College web site: [http://www.northland.edu/student-life-support-disability.htm](http://www.northland.edu/student-life-support-disability.htm)

**Contact:**  
Kathleen Skoraczewski  
Campus Counselor  
Division of Student Life  
Room 202B - Ponzio Campus Center; Ext 1369  
kskoraczewski@northland.edu

**Overview**
This specialized course will consist of an in-depth study of the human skeletal, articular (joints), and muscular systems (structure, function, and interaction). It is designed to meet the needs of students in the Coaching Minor, the Outdoor Education Major, the sciences, and preparatory programs in Occupational Therapy, Physical Therapy, Nursing, and Medicine. As the course progresses, the student will find that this particular grouping of topics provides for a very logical progression and that mastery of each successive topic will enhance learning of the next.

Your instructor believes that each academic discipline develops its own system of thought that is the basis for understanding all existing information in the field and synthesizing new ideas. More than anything else, he hopes to use the course content to help students understand the system of thought in this particular field. While retention of the specific information will be short term (unless reinforced by frequent use), the concepts and ideas that constitute the system of thought will persist and
enable students to recover the forgotten specifics, explore and understand other related information, and remain current, active, and creative in this field.

The instructor will attempt at all times to help students develop concepts from the information taught, learn anatomy rather than memorize it, and relate the material taught to familiar life experiences and to future applications in vocational settings.

It is imperative that students understand that this information is truly alive and useful. Mastery of this material will help them to analyze motion, diagnose movement and technique errors, test for injury and disability, understand mechanisms of injury, design prophylactic and rehabilitative exercises, understand the impact of disabilities affecting the musculoskeletal system, and be an intelligent and informed consumers of the professional and popular literature in this field.

**Outcomes**
- Functional ability to analyze joint movements and determine which muscles produce them
- Functional ability to predict a muscle's function by determining the action lines of its parts and considering the movements available at the joint in question
- Functional understanding of the structure and function of the joint systems covered in class
- Functional ability to devise and prescribe rehabilitative and prophylactic exercises for the joint systems covered
- Functional understanding of common mechanisms of injury for the joint systems covered
- Functional understanding of disabilities produced by injuries and developmental problems affecting the musculoskeletal system

The following is a general progression of the class. Content and timing will vary according to the needs and interests of the class.

**Week 1**
Lecture—Introduction, basics, terminology, planes, axes, anatomic regions
Read chap. 1, Brunnstrom’s 6th.

**Week 2**
Lecture—Nature of bones, types, make-up, parts, bone growth (longitudinal)
Read chap. 2, Brunnstrom’s 6th.

**Week 3**
Monday, 1/19/15, MLK Day: no class
Lecture—Overview bone formation and remodeling, cartilage—types and nature, characteristics of joints, types of joints
Read Handouts and chap. 3, Brunnstrom’s 6th.

**Week 4**
Lecture—Levers and leverage, planes, axes, movements, muscle fiber arrangement, roles in which muscles can act, types of contraction
Read chap. 4, Brunnstrom’s 6th.

**Week 5**
Structure and musculature of the shoulder girdle
Read chap. 5, Brunnstrom’s 6th.
**Week 6**
Shoulder girdle, shoulder structure and musculature
Read chap. 5, Brunnstrom’s 6th.

**Week 7**
Shoulder musculature
Read chap. 6, Brunnstrom’s 6th.

**Week 8**
Shoulder musculature cont., structure of the radio-ulnar joint, wrist and hand,
musculature of the wrist
Read chap. 6, Brunnstrom’s 6th.

**Week 9**
Radio-ulnar joint, wrist and hand, cont., **Wednesday: Mid-Session Break Begins**
Read chap. 7, Brunnstrom’s 6th.

**Week 10**
Wrist and hand cont.
Read chap. 7, Brunnstrom’s 6th.

**Week 11**
Structure and musculature of the spine
Read chap. 8, Brunnstrom’s 6th.

**Week 12**
Spinal musculature cont., structure and musculature of the pelvis and hip
Read chap. 9, Brunnstrom’s 6th.

**Week 13**
Structure and musculature of the knee
Read chap. 10, Brunnstrom’s 6th.
**Thanksgiving break**

**Week 14**
Knee cont., structure and musculature of the ankle and foot
Read chap. 11, Brunnstrom’s 6th.

The course laboratories will focus on skeletal structure. Students will learn the skeleton segment-by-segment. The procedure for each part will be as follows:

- Lecture presentation on the skeletal segment
- Two 30-minute student study sessions per segment (negotiable according to student progress)
- A visual/written quiz on each segment

The emphasis will be on gaining an understanding of the naming system, relating the names to the structure and function of the bony features, and learning the names rather than memorizing them. This professor prefers to base the rate of progress on student readiness rather than a predetermined schedule.
Further, we will deviate from the standard grouping of bones by Axial or Appendicular
designations, preferring to mix and match with the muscular system being discussed
in lecture. The segments of the skeleton will be covered in the following order:

- Skull and jaw
- Clavicle, ribs, sternum, scapula
- Arm, forearm, hand
- Spine
- Pelvis
- Thigh, leg, foot

**Lecture Exams**
Lecture exams will take the form of a series of guided investigations (take-home
exams) the nature of which will be explained in class. Students will be asked to use
course content to solve problems that are practical and relevant to their future work
and play.

**Lab Equipment**
Required: one human brain per student. You will not be expected to remove it from
your head.

**Grading**
Grades in this class will be calculated on a straight percentage basis. This is
accomplished by dividing the number of points earned by the total number of points
possible. I do not grade on improvement except to the extent that improved scores
will bolster the student’s overall point total. Full and enthusiastic class participation is
expected of all students and should not be viewed as something extra that can be
counted on to compensate for poor performance on written assignments.

The grading scale is as follows: 93-100 A; 90-92 A-; 87-89 B+; 83-86 B; 80-82 B-;
77-79 C+; 73-76 C; 70-72 C-; 67-69 D+; 60-66 D; 0-59 F.

**Attendance**
Due to increasing problems with poor attendance, it has become necessary to restate
and reassert the attendance policy for this class. Understand that a grade in a class,
in effect, certifies that the student has been exposed to the curriculum as described
in the syllabus, has participated in all activities associated with the class, and has
completed all assignments to a degree reflected in the final grade. In other words,
you must attend the class, in order to pass the class!

That being said, the policy for attendance and late assignments with respect to
grading is as follows:

Attendance in this class does count, with 1 point being deducted from your final point
total for each hour of unexcused absence. Excused absences include such things as
illness, certain family obligations, and certain school sponsored activities and trips.
Studying for an exam for another class is not an excused absence on the basis of it
being a school sponsored activity. Misses can be made up by writing and submitting
a paper which covers the material covered in class on the day in question. Under no
circumstances should a student assume that by merely submitting a paper they have
made up for 100% of the class missed. In order to be considered equivalent, the
paper must be of adequate length, substance, and quality, based on the judgment of the professor.

Because this professor has had students run a doctor’s appointment scam as a means to generate excused absences, he will expect students to schedule medical appointments outside of class time. Exceptions will be made for emergencies and extenuating circumstances.

In this class, attendance is taken with an attendance sheet. Any forgeries of signatures (another scam) will result in the hour being counted as an unexcused absence for both the forger and the person for whom the forgery was attempted.

**Late Work**
It is the instructor’s policy to allow the class to negotiate due dates for out of class assignments. That being said, assignments must be turned in on time. There will be a penalty of –5% per day late. Any exceptions must be negotiated in advance.

**Cellular Phones**
Students will be expected to turn-off cell phones for the duration of each class. Students taking calls or texting during class will be asked to turn-off their phones and deposit them on a table at the front of the room. Refusals will result in an invitation to leave class for the day.

**Computers, Tablets, and Handheld Devices in Class**
While students may use electronic devices to do class-related work during class, non-class related uses will not be tolerated. Students using devices inappropriately will be asked to turn them off.

**Bibliography**

*The following relevant titles are part of the Dexter Library collection:*


Functional Anatomy in Sports, by Jurgen Weineck


*Living Anatomy*, by Joseph E. Donnelly

*Color Atlas of Surface Anatomy*, by Kenneth M. Backhouse and Ralph T. Hutchings—living subjects (not dissections), something a little different—will help you to locate deep structures from surface features

*Physical Examination of the Musculoskeletal System*, by Melvin Post

*Clinical Examination of the Injured Knee*, by Cross & Crichton (an excellent book by Australian authors)
Limb Prosthetics, 6th. ed., by A. Bennett Wilson Jr.—Therapeutic and Universal Design majors are encouraged to consult this text on a regular basis as we work on various limb segments. This will be an ideal opportunity to compare prosthetic function to normal function and appreciate the logic of the prosthetic design.

**Anatomy Internet Resources**

Anatomy Corner: [http://anatomycorner.com](http://anatomycorner.com)
American Association of Anatomists: [http://www.anatomy.org/content/knowledge-center](http://www.anatomy.org/content/knowledge-center)

**Orthopaedics Online**


**Bone Quiz Study Aids**

Skeletal System: [https://homes.bio.psu.edu/faculty/strauss/anatomy/skel/skeletal.htm](https://homes.bio.psu.edu/faculty/strauss/anatomy/skel/skeletal.htm)

**Bone Formation:**

Bone Formation YouTube: [http://www.youtube.com/watch?v=p-3PuLXp9Wg](http://www.youtube.com/watch?v=p-3PuLXp9Wg)