



**AT 270 – Statistics in Athletic Training and Health Sciences
COURSE SYLLABUS**

AT 270	Statistics	Semester/Year	Spring 2013
Instructor	Michelle Cleary PhD, ATC, CSCS	Classroom	LL B-117
Office Hours	M-W 1:00-3:00 pm, or by appointment	Class Day /Time	T/Th 10:00 am-11:15 am
Office Phone	714-628-2797	Email	cleary@chapman.edu
Location	Reeves 208		

Prerequisites or Co-requisites

Sophomore year of ATEP, consent of instructor, and athletic training major.

Catalog Description

Prerequisite, [MATH 104](#), or consent of instructor. This course covers hypothesis testing and statistical analysis using descriptive, inferential, parametric, and non-parametric types of statistics. Specific focus is also given to evidence-based medicine statistics including use of current best evidence to analyze decision-making in patient care. (Offered spring semester.) 3 credits.

Course Format

This course will be a seminar format consisting of small group work, student-presentations, journal club exercises and computer software use. Additional methods of instruction may be utilized, such as role playing, interactive problem-based learning, and team-based peer learning to promote critical thinking skills involving Athletic Training competencies.

ATEP Program Goals and Objectives

Graduates of Chapman University’s ATEP will acquire the knowledge, demonstrate the skills and possess the professional values required of entry-level, board certified athletic trainers.

Upon completion of the ATEP, the student will:

- Successfully pass the Senior Written & Practical Exit Examinations with a score of 80% or higher
- Meet or exceed the national average for pass rate for first time test-takers on the Board of Certification's entry-level certification examination.
- Behave and perform in an ethical and professional manner during clinical experiences
- Demonstrate a minimum-level of competence in completing the psychomotor competencies and clinical proficiencies associated with entry-level athletic training skills.

Course Goals

In order to demonstrate knowledge of the practice of athletic training, to think critically about the practices involved in athletic training, including the ability to integrate knowledge, skill and behavior, and to assume professional responsibility, the entry-level certified athletic trainer must possess the knowledge and skills to understand professional responsibilities and avenues of professional development to promote athletic training as a professional discipline.

Course Objectives

Upon completion of this course students will understand:

- Types and characteristics of biomedical journals
- Types and characteristics of articles published in biomedical journals
- The process from manuscript to published work: peer review, editorial selection, prepublication editing, post-publication
- The scientific method and scientific hypotheses

- Structure of a research paper, and how it relates to the scientific method
- Types and qualities of abstracts, and problems of abstract-only reading
- How to "browse" a research paper
- Types and characteristics of figures and tables, and implications for reading them
- Accuracy and precision, and main issues of descriptive statistics
- Basic concepts of hypothesis testing (inferential statistics)
- Basic concepts of clinical research design
- Critical appraisal: definition and role in support of clinical practice

Course Student Learning Outcomes

Upon completion of this course, students will be able to:

- Apply the knowledge of Evidence-Based Practice (see competencies below)
- Foundational Behaviors of Professional Practice are basic professional behaviors that permeate professional. These behaviors include:
 - Primacy of the Patient, Advancing Knowledge, and Professionalism.

From: NATA (2011, 5th Ed) Education Competency and Clinical Proficiency Content Areas (see details below).

Required Text and Materials

Required readings come from:

- Salkind N. *Statistics for People Who (Think They) Hate Statistics*, 4th Ed. Thousand Oaks, CA: Sage Publishers. 2012.. **E-textbook available here:**
http://www.coursesmart.com/IR/1793521/9781412979597?_hdv=6.8
- Salkind N. *Study Guide for Statistics for People Who (Think They) Hate Statistics*, 4th Ed. Thousand Oaks, CA: Sage Publishers. 2012.

Additional Reading

Class material may also be derived from:

- Articles assigned for outside of class reading

Supplies

Access to MS Excel is required.

Assessment of Student Learning

The purpose of the assignments is to help engage students in preparatory readings and follow up with content discussed in class. Because each assignment will be made to fit the type of content and instruction, assignments will vary in length and complexity. Points for each assignment will match the length and complexity of the assignment and will be designated when each assignment is given. Students should assume that about one reading or assignment will be due each week, with the details of each assignment provided at least one class period before it is due.

Students will be evaluated on the following components of the course:

- Active Participation
- Readings/Article Presentation
- Homework Assignments
- Quizzes and Exams

Active Participation

This course is designed to be learner-centered, meaning student preparation for and participation in class are an integral part of the success of each student. The student will begin the semester with 100 participation points, and points will be deducted for activities/behaviors such as lack of attendance, not participating in discussions, working on non-class materials during class, and other behaviors.

Assignments and exams used to enhance your learning experience in this course include:

- **Readings/Article Presentation:** You are responsible for the material covered in the book *prior to attending class*. Please note that the week's readings are specified in the class schedule on the following pages. In addition to these readings, the instructor may assign supplemental readings throughout the semester. These supplemental readings do not appear on the schedule as these readings will be assigned at the instructor's discretion. You will be assigned an article to present to the class.
- **Homework:** Students will be responsible for the completion of four homework assignments. The purpose of the assignment is to assist students in applying their understanding of the statistical procedures discussed in class as well as to provide an opportunity for students to respond to the readings.
- **Quizzes:** Four quizzes will be given throughout the semester and will require that you read and respond to material in the textbook as well as work out mathematical/statistical procedures discussed in class.
- **Exams:** One mid-term exam and one final exam will be given on the material covered in the class and on the assigned readings. Exams will be based on the readings, material discussed in class, quizzes, and homework assignments.

Final Grades

Will be arrived through scores on attendance, presentations, and written examinations as follows:

Criteria	Points
Attendance/Active Participation/Homework	20%
Article presentation	20%
Quizzes ($n=4$)	20%
Written Exams ($n=2$)	40%
Final Grade Total	100%

Grading Scale

Grades and corresponding grade points will be assigned as follows:

Criteria	Grade	Grade Points	Points from this Class
Excellent	A	4.0	90 - 100% of points available (540-600 points) and perfect attendance
	A-	3.7	
Very good	B+	3.3	80 - 89% of points available (480-539 points) and no more than 3 absences
	B	3.0	
	B-	2.7	
Satisfactory	C+	2.3	70 - 79% of points available (420-479 points) and no more than 3 absences
	C	2.0	
	C-	1.7	
Unsatisfactory	D+	1.3	< 70% of points available (<419 points) and/OR more than 3 absences
	D	1.0	



Minimum passing	D-	0.7	
Failing	F	0.0	

Attendance/Absences

Students are expected to attend all class sessions. Extenuating circumstances should be communicated to the instructor before class is missed. You are responsible for communicating with the instructor and fellow students regarding the material that was discussed in your absence. Course absences *for any reason* (including athletics and ATEP absences) must be made up. Absences in excess of three classes will impact the ability of the student to pass the course. The university recommends that students who are absent 20 percent of the course should be failed. Students who do not attend the first class meeting of a course in which they are registered may be administratively dropped, unless they make arrangements with the instructor prior to the first day of class.

Tardiness

Arriving late or leaving early is not acceptable and repeated occurrences will result in point deductions from course grade. Instructor should be called if student knows they will be late or are sick. 10 points for repeated excused tardiness and 20 points for unexcused occurrences.

Make-up Exams/Course Work

All absences *for any reason* (including athletics and ATEP absences) require make-up work to be submitted on-time. Late work will be accepted for a reduced grade within 1 week of the due date. Work may be submitted until the last day of class for no credit, but may be considered for a passing grade. Unforeseen or extenuating circumstances (i.e., car accident, death in the family) may be considered for full credit if submitted within 1 week of the incident.

Incompletes

The grade of Incomplete may be assigned by an instructor if a student, through circumstances beyond his or her control, has not completed a small portion of a course by the conclusion of the term. The student must request the grade of Incomplete and must propose a date acceptable to the faculty member by which the missing work will be completed. A grade of Incomplete may not be assigned to give a student a chance to do more work to improve a grade. A grade of Incomplete may also be assigned by an instructor if academic integrity is in question at the time grades are due and the instructor requires more time to resolve the issue.

Cell Phone Use

Use of cell phones, including texting and internet searching, are not acceptable. During class cell phones should be either turned off or put on vibrate and should only be answered in emergencies. Students are expected to answer calls outside the class room and should not interrupt class. Under no circumstances will texting be tolerated in class. Step outside or wait. Please arrive and leave class on time to minimize distractions.



Academic Integrity Violations

Chapman University is a community of scholars that emphasizes the mutual responsibility of all members to seek knowledge honestly and in good faith. Students are responsible for doing their own work, and academic dishonesty of any kind will be subject to sanction by the instructor and referral to the University's Academic Integrity Committee, which may impose additional sanctions including expulsion. Please see the full description of Chapman University's Policy on Academic Integrity at www.chapman.edu/academics/academic-integrity.

ATEP Integrity Policy

The Athletic Training Education Program enforces a zero tolerance policy regarding violations of academic integrity. No credit will be given for exams/assignments where academic integrity is compromised. All violations will be reported to the Chapman University Academic Integrity Committee. Any violation of the Academic Integrity Policy at Chapman University may result in the student being removed from the Athletic Training Education Program.

Violation Examples	Recommended Sanction
Copying answers or cheating on an exam	F for the course
Plagiarism (see handout on Blackboard for examples)	F for the course
Claiming the work of another student as your own	F for the course

Plagiarism

Representing the words, research findings, or ideas of another person as your own in any academic exercise [At their discretion, faculty may submit student work to plagiarism-detection software, such as www.turnitin.com for review.]

Course Calendar

The following is a week by week review of materials to be covered, reading assignments, and assignment due dates **Assignments Due***, **DB=Discussion Board**, **WB= Workbook**; **MC=Multiple Choice**, **Ex=Exercises**. *** All assignments due at 10 am as indicated.

Date	Tuesday	Thursday
Week 1 01/29/13	Stress reduction session, Intro to Excel Obtain ILLiad Account	Very Basic! Math Review and Searching for best evidence (PubMed, EBSCO, CINHAL) Read Appendix E and Ch 1
Week 2 02/05/13	Types of Evidence and clinically relevant questions (PICO) Post answers on DB: Ch 1- Q1,2,4,6 Read/discuss assigned article in class	EBP-Disablement Models and Use of Statistics and Journals Answer questions on DB: Part I- Disablement Models
Week 3 02/12/13	Measures of Central Tendency Read Ch 2, WB Ch 2: MC1-3, Ex 1-3; Answer questions on DB: Searching the Cochrane Library	Critically apprising the evidence (PEDro, SORT, CEBM) Complete EBP tutorial Module 1; post screen print of completion on DB
Week 4 02/19/13	Common methods of outcomes assessment	Sensitivity & Specificity



	Answer questions on DB: Part II: Clinical Outcomes Assessment	Answer questions on DB: Patient- and Clinician-Rated Outcome Measures
Week 5 02/26/13	Variability Read Ch 3; Answer WB Q1-6; Ex Q1,2	Data Distribution and Charts Read Ch4; Answer WB MCQ1-9; Ex Q1,2
Week 6 03/05/13	Relationships between Variables (Correlations) Read Ch 5; Answer WB MC Q1-17; Ex Q1 Complete EBP tutorial Module 2; post screen print of completion on DB	Reliability and Validity Read Ch 6; Answer WB MC Q1-28 (even); Ex Q2, 4
Week 7 03/12/13	Hypotheses and Probability Read Ch 7 & 8 Answer WB Ch 7 MC Q1-20; and WB Ch 8 MC Q1-13; Ex Q1	Significance and One-Sample Z test Read Ch 9 & 10 Answer WB Ch 9 MC Q1-19; EX Q1; and Ch 10: MC Q1-5, Ex Q1-2
Week 8 03/19/13	Comparing Means- Independent T-Tests Read Ch 11	Answer WB Ch 11: MC Q1-14; Ex Q1
03/26/13	Spring Break – No Class	Complete online training module: NIH Online Training for Protection of Human Subjects
Week 9 04/02/13	Mid-Term Exam (Ch 1-9, online) Post NIH training certificate to DB	FWATA-Sacramento, CA (no Class) Complete EBP tutorial Module 3; post screen print of completion on DB
Week 10 04/09/13	Comparing Means- Dependent T-Tests Read Ch 12	Answer WB Ch 12: MC Q1-7; Ex Q1
Week 11 04/16/13	Analysis of Variance Read Ch 13	Answer WB Ch 13: MC Q1-6; Ex Q2,3
Week 12 04/23/13	Correlations Read Ch 15	Answer WB Ch 15: MC Q1-4; SA Q1,2; SPSS Q1
Week 13 04/30/13	The 10 Commandments of Data Collection Read Ch 21	Catch up, if needed
Week 14 05/07/13	Review week	
Week 15 05/14/13	Final Exam	

***I reserve the right to make changes to the syllabus and tentative course schedule as necessary**

Students with Disabilities Policy

In compliance with ADA guidelines, students who have any condition, either permanent or temporary, that might affect their ability to perform in this class are encouraged to contact the Office of Disability Services. If you will need to utilize your approved accommodations in this class, please follow the proper notification procedure for informing your professor(s). This notification process must occur more than a week before any accommodation can be utilized. Please contact Disability Services at (714) 516-4520 or (www.chapman.edu/students/student-health-services/disability-services) if you have questions regarding this procedure, or for information and to make an appointment to discuss and/or request potential accommodations based on documentation of your disability. Once formal approval of your need for an accommodation has been granted, you are encouraged to talk with your professor(s) about your accommodation options. The granting of any accommodation will not be retroactive and cannot jeopardize

the academic standards or integrity of the course.

Upon individual and advanced request, this syllabus and all instructor-developed materials in this course will be provided in alternate forms (such as large print, negative image, etc.)

Specific Competencies covered in this course are:

Evidence-Based Practice (EBP). Evidence-based practitioners incorporate the best available evidence, their clinical skills, and the needs of the patient to maximize patient outcomes. An understanding of evidence-based practice concepts and their application is essential to sound clinical decision-making and the critical examination of athletic training practice.

Evidence-based practitioners incorporate the best available evidence, their clinical skills, and the needs of the patient to maximize patient outcomes. An understanding of evidence-based practice concepts and their application is essential to sound clinical decision-making and the critical examination of athletic training practice. Although conducting research is important to the profession of athletic training and to the graduate-level Master of Science degree, practicing in an evidence-based manner should not be confused with conducting research. EBP focuses on the knowledge and skills necessary for entry-level athletic trainers to use a systematic approach to ask and answer clinically relevant questions that affect patient care by using review and application of existing research evidence. Using a systematic approach provides the building blocks for employing evidence-based practice.

One strategy, among others, is to use a five-step systematic approach to solving clinical problems:

- 1) Create a clinically relevant question using a pre-defined question format (e.g., PICO= Patients, Intervention, Comparison, Outcomes; PIO = Patients, Intervention, Outcomes);
- 2) Search for the best evidence;
- 3) Critically analyze the evidence;
- 4) Integrate the appraisal with personal clinical expertise and patients' preferences; and
- 5) Evaluate the performance or outcomes of the actions.

All items listed in parentheses (e.g.) are intended to serve as examples and are not all encompassing or the only way to satisfy the competency.

KNOWLEDGE AND SKILLS

EBP-1. Define evidence-based practice as it relates to athletic training clinical practice.

EBP-2. Explain the **role of evidence** in the clinical decision making process.

EBP-3. Describe and differentiate the **types** of quantitative and qualitative research, research **components**, and **levels of research evidence**.

EBP-4. Describe a **systematic approach** (e.g., five step approach) to create and answer a clinical question through review and application of existing research.

EBP-5. Develop a relevant **clinical question** using a pre-defined question format (e.g., PICO= Patients, Intervention, Comparison, Outcomes; PIO = Patients, Intervention, Outcomes).

EBP-6. Describe and contrast research and literature **resources** including databases and online critical appraisal libraries that can be used for conducting clinically-relevant searches.

EBP-7. Conduct a **literature search** using a clinical question relevant to athletic training practice using search techniques (e.g., Boolean search, Medical Subject Headings) and resources appropriate for a specific clinical question.



EBP-8. Describe the differences between narrative reviews, systematic reviews, and meta-analyses.

EBP-9. Use standard criteria or developed scales (e.g., Physiotherapy Evidence Database Scale [PEDro], Oxford Centre for Evidence Based Medicine Scale) to **critically appraise** the structure, rigor, and overall quality of research studies.

EBP-10. Determine the **effectiveness and efficacy** of an athletic training **intervention** utilizing evidence-based practice concepts.

EBP-11. Explain the theoretical foundation of **clinical outcomes assessment** (e.g., disablement, health-related quality of life) and describe common methods of outcomes assessment in athletic training clinical practice (generic, disease-specific, region-specific, and dimension-specific outcomes instruments).

EBP-12. Describe the **types of outcomes measures** for clinical practice (patient-based and clinician-based) as well as types of evidence that are gathered through outcomes assessment (patient-oriented evidence versus disease-oriented evidence).

EBP-13. Understand the **methods of assessing patient status and progress** (e.g., global rating of change, minimal clinically important difference, minimal detectable difference) with clinical outcomes assessments.

EBP-14. **Apply and interpret** clinical outcomes to assess patient status, progress, and change using psychometrically sound outcome instruments.