MT. DIABLO UNIFIED SCHOOL DISTRICT
COURSE OF STUDY

COURSE TITLE: Sports Medicine II
COURSE NUMBER: 8503
CBEDS NUMBER: 4284
DEPARTMENT: Science
LENGTH OF COURSE: One Year
CREDITS PER SEMESTER: 5
GRADE LEVEL(S): 12
REQUIRED OR ELECTIVE: Elective
UC A-G: G (Pending Approval)

PREREQUISITES:
Required – Sports Medicine I

BOARD OF EDUCATION ADOPTION: TBD

COURSE DESCRIPTION:
This *Sports Medicine II* course provides an excellent opportunity for students to continue to explore their interest in the fields of health science and medicine, specifically focused toward careers in athletic training, emergency field medicine and therapeutic services. This course is aligned with California Career Technical Education Model Curriculum Standards and is serving the purpose of being a 12th grade sports medicine pathway capstone CTE course within a four-year medical and biotechnology academy. This class provides a framework of advanced skills for: understanding functional anatomy and kinesiology, building on the concepts of anatomy/physiology learned in *Sports Medicine I.* This course also presents the full scope of athletic trainer aide duties through a lecture/lab/internship format, where students will acquire fundamental practical concepts of training room development; risk management; administrative and legal issues; and hands-on application of theory on evaluation, assessment, prevention, treatment, and rehabilitation of athletic injuries. Internship opportunities are integrated into the course through after-school athletic events assisting medical staff and working with other healthcare professionals. Career technical education standards such as communication, career planning, technology, problem solving, safety, responsibility, ethics, academic skills, technical knowledge and teamwork are incorporated into academic units throughout the course.

COURSE PURPOSE:
This *Sports Medicine II* course is designed to be the capstone course as part of a sports medicine pathway in a medical based academy. The focus of this course is to serve as an application based course that allows students to apply knowledge, theory and skills learned in *Sports Medicine I* and *Sports Medicine II* through a variety of hands-on activities including a 150-hour on campus internship with the school's athletics teams.

Students will continue to learn more advanced skills in sports medicine and athletic training that will continue to build skills that will be beneficial in future endeavors along any path in healthcare.

COURSE OUTLINE:
Section A: Orientation

Unit Objective: Discuss objectives for the course including student expectations, student outcomes, teacher expectations, classroom policies, and procedures.

Unit Competencies:
1. Review course objectives and competencies.
2. Review knowledge of course requirements and grading policies.
3. Discuss class expectations including: class rules, appropriate dress, and behavior and class prerequisites and prior knowledge from *Sports Medicine I*.
4. Discuss the role of this capstone course within the Medical and Biotechnology Academy sequence related to basic skills, future classes and future education and internships/employment.
5. Review classroom/school/athletic facility safety and disaster procedures.
6. Discuss California CTE standards and how they apply to this course within the academy.

Section B: Advanced Foundations in Athletic Training

Unit Objective: Describe the requirements and responsibilities of the athletic trainer and varying sports medicine staff that are involved in a functioning sports medicine program.

Unit Competencies:
1. Explain the function and roles of support personnel in sports medicine.
2. Discuss current trends in the field of sports medicine.
3. Explore career opportunities, education and training requirements for careers in sports medicine.
4. Research and visit colleges and universities that offer educational programs in athletic training and sports medicine related fields.
5. Discuss desirable traits and qualities of personnel on a sports medicine team.
6. Review the importance of professional healthcare associations in sports medicine
7. such as the National Athletic Trainers Association, American Physical Therapy Association, and California Athletic Trainers Association.

Section C: Creating a Successful Athletic Training Program

Unit Objective: Students will understand and describe the standard operating procedures of an Athletic Training Facility.

Unit Competencies:

1. Establish a strategic plan for the athletic training program.
2. Plan and organize a well-designed and functional high school athletic training facility.
3. Identify and validate procedures and policies that should be enforced in the athletic training room.
4. Identify typical daily tasks required for the various areas of the athletic training room.
5. Construct the necessary records that must be documented and maintained by the athletic training staff.
6. Explain budgetary concerns and limitations for ordering supplies and equipment.
7. Review and explain the relevance of performing pre-participation physical exams on athletes that utilize the athletic training facilities.

Section D: Professional and Effective Communication

Unit Objective: Recognize and use appropriate professional communication skills. Unit

Competencies:
1. Use correct and appropriate medical terminology.
2. Demonstrate competent verbal communication skills using appropriate vocabulary, demeanor, and tone in the classroom, athletic training room, and at athletic events.
3. Practice professional verbal skills for problem solving and resolving conflict.
4. Demonstrate active listening skills by giving full attention to what others are saying, taking time to process the points being made, asking appropriate questions, and not interrupting at inappropriate times.
5. Read and interpret written information such as reports, injury documentation, and procedural directions.
6. Generate reports, injury documentation and other written communicative forms applicable to the healthcare profession.

Section F: Roles of Responsibilities of the Athletic Trainer Student Aide

Unit Objective: Review and discuss roles and responsibilities of athletic trainer student aides in assisting with the athletic trainer program including scope of practice, confidentiality, ethics, liability and maintaining of certifications.

Unit Competencies:
1. Identify all members of the school's Sports Medicine team.
2. Identify and discuss the roles of all members of the Sports Medicine team, both professional and interns.
3. Review and adhere to the rules of ethics, confidentiality, and liability considerations.
4. Explain the importance of maintaining positive relationships between athletic trainers, coaches, athletes and parents.

5. Review and communicate daily responsibilities of athletic trainer student aides in the training room and at athletic events.
6. Maintain appropriate relationships and methods of communication with student athletes that are consistent with those in a professional healthcare setting.

Section G: Legal and Ethical Concerns in Sports Medicine

Unit Objective: Explore and understand the ethical, professional, and legal behaviors in sports medicine that are consistent with applicable laws, regulations and healthcare organization norms.

Unit Competencies:
1. Define correct legal terminology and concepts used in a healthcare setting such as negligence, torts, liability, and assumption of risk.
2. Analyze the legal and ethical considerations for athletic trainers within a healthcare setting and become familiar with the *Patient Bill of Rights* and confidentiality laws.
3. Explore measures that can be taken by athletic trainers and coaches that would reduce the risk of legal litigation.
4. Explain the liability placed on product manufacturers.
5. Identify the categories of insurance that are essential for athlete's to be protected legally.
6. Classify the types of insurance that protect athletic trainers and all sports medicine staff who are acting as healthcare providers.
7. Review the HIPAA – Health Insurance Portability and Accountability Act.

Section H: Athletic Event Field Management

Unit Objective: Utilize knowledge of sporting events to create a functional, specialized field set up for varying athletic events on campus that lends itself to a successful athletic training support system for the event's athletes.

Unit Competencies:
1. Identify specific athletic training supplies and equipment needed for baseball/softball.
2. Identify specific athletic training supplies and equipment needed for football.
3. Identify specific athletic training supplies and equipment needed for basketball.
4. Identify specific athletic training supplies and equipment needed for volleyball.
5. Identify specific athletic training supplies and equipment needed for tennis.
6. Identify specific athletic training supplies and equipment needed for track and field.
7. Identify specific athletic training supplies and equipment needed for soccer.
8. Identify specific athletic training supplies and equipment needed for swimming/diving.
9. Identify specific athletic training supplies and equipment needed for weightlifting.
10. Identify specific athletic training supplies and equipment needed for cross-country.
11. Demonstrate proper field and treatment station setup and preparation for baseball/softball events.
12. Demonstrate proper field and treatment station setup and preparation for football events.
13. Demonstrate proper field and treatment station setup and preparation for soccer events.
14. Demonstrate proper field and treatment station setup and preparation for volleyball events.

15. Demonstrate proper field and treatment station setup and preparation for tennis events.
16. Demonstrate proper field and treatment station setup and preparation for basketball events.
17. Demonstrate proper field and treatment station setup and preparation for track and field events.
18. Demonstrate proper field and treatment station setup and preparation for cross-country events.
19. Review and discuss the need for organizational skills and development of event-
20. based checklists to maintain an effective and supportive sports medicine program at athletic events.

Section I: Emergency Action Plan and Preparedness

Unit Objective: Identify the components of a successful emergency action plan and create a procedural emergency plan for the school's athletic venues.

Unit Competencies:

1. Create a procedural emergency action plan for each athletic venue site on campus.
2. Identify who is responsible for making emergency calls and what the procedures will be for making that call.
3. Identify who stays with the injured victim and define their roles in treatment and communication with other responders.
4. Prepare written scripts for communication when making 911 calls.
5. Discuss and review the effectiveness of prior emergency action plans.
6. Discuss how often emergency action plans need to be reviewed and practiced to maintain a safe and calm response to emergencies.

Section J: Sports Equipment and Protective Gear

Unit Objective: Become familiar with sport specific equipment and protective gear as it applies to the roles of injury prevention and treatment for an athletic trainer.

Unit Competencies:

1. Demonstrate the ability to fit sport specific protective equipment properly.
   - Football helmets
   - Football shoulder, hip, thigh, spine, knee pads
   - Mouth guards
   - Running shoes
   - Baseball/softball helmets
2. Demonstrate the ability to fit preventative and therapeutic braces for knees, ankles, wrists and elbows.
3. Differentiate between good and bad features of various models and brands of protective equipment.
4. Contrast the advantages and disadvantages of customized versus off the shelf foot, ankle and knee protective devices.

Section K: On-the-Field Acute Care and Emergency Procedures

Unit Objective: Students will be able to identify medical emergencies, respond to and manage the scene accordingly and provide acute medical care to victims of the medical emergency.

Unit Competencies:
1. Establish and review prior school emergency action plans for protocol/procedures in emergency situations.
2. Demonstrate the proper techniques used in cardio pulmonary resuscitation and how to manage an obstructed airway and explain their importance regarding victims of medical emergencies.
3. Demonstrate proper treatment techniques for various degrees of hemorrhaging (bleeding).
4. Identify the signs of a victim in shock and apply proper treatments.
5. Describe and demonstrate the proper emergency treatments for musculoskeletal injuries.
6. Describe and demonstrate procedures for moving and transporting injured athletes from the field of play.

Section L: Injury Assessment and Evaluation

Unit Objective: Review and demonstrate the methodical injury evaluation process and assessment methods utilized in sports medicine.

Unit Competencies:
1. Describe the systematic process of injury evaluation in sports medicine
2. Demonstrate an understanding of life threatening injury that requires on-field treatment.
3. Demonstrate on-field evaluation techniques using the HOPS (History, Observation, Palpation, Special Tests) assessment method.
4. Demonstrate clinical evaluation techniques using the HOPS (History, Observation, Palpation, Special Tests) assessment method.
5. Explain the importance of bilateral comparison in injury evaluation.
6. Identify and perform ROM (range of motion) and functional special tests to identify musculoskeletal injuries
7. Organize the process for documenting findings based on off-the-field or progress based evaluation.

Section M: Blood borne Pathogens and Standard Precautions

Unit Objective: Students will understand the various methods of transmission of blood borne pathogens between athletes and/or athletic trainers and will demonstrate standardized methods to reduce or prevent exposure to blood borne pathogens.

Unit Competencies:
1. Explain what bloods borne pathogens are and how they can affect athletes and athletic trainers.
2. Describe the transmission methods, signs, symptoms and treatment for the

following blood borne pathogens:
- Hepatitis B
- Hepatitis C
- HIV

3. Explore the pros and cons of athletes infected with blood borne pathogens participating in sports.
4. Evaluate universal precautions as defined by OSHA (Occupational Safety and Health Administration) and how they apply to athletic trainers.

Section N: Training and Conditioning Techniques

Unit Objective: Students will examine the roles of athletic trainer in strength and conditioning by examining the principles of conditioning and analyzing specific techniques used for improving fitness, strength, endurance and flexibility of athletes.

Unit Competencies:
1. Identify sport specific conditioning techniques to improve performance.
2. Define terminology used in conditioning such as fitness, strength, endurance, and flexibility.
3. Evaluate the importance of flexibility, strength, and cardiorespiratory endurance for both athletic performance and injury prevention.
4. Analyze specific techniques and principles for improving flexibility, muscular strength, and cardiorespiratory endurance. Section O: Pathology of Sports Injuries
5. Unit Objective: Students will be able to identify the various types of injuries that may occur to the athlete's body and what forces are responsible for those injuries and how the body responds to injury.

Unit Competencies:
1. Analyze biomechanical movements and factors involved in sports injuries
2. Distinguish the major biomechanical forces occurring in sports injuries.
3. Review the structures of soft tissue and identify the specific mechanical forces that are capable of causing skin, muscle, ligament, tendon, synovial joint, and bone injuries.
4. Define the terminology that describes injuries incurred during sports participation.
5. Compare and contrast the various types of bone fractures and explain how they occur.
6. Identify factors that will impede the tissues healing process.
7. Discuss the healing process of various types of tissue (i.e. cartilage, ligaments, tendons, muscle, nerves)
8. Describe the healing process of bone.
9. Define pain and the variations that occur in athlete's definition of pain.

Section P: Therapeutic Modalities

Unit Objective: Identify principles of therapy and demonstrate various therapeutic techniques utilized during rehabilitation.

Unit Competencies:

1. Recognize the legal ramifications of treating athletes with therapeutic modalities.
2. Describe theoretical uses of various types of modalities.
3. Explore various methods of cryotherapy, thermotherapy, electrotherapy, massage therapy and sound therapy.
4. Apply and demonstrate the ability to effectively use cryotherapy, thermotherapy, massage therapy and electrical therapy techniques to promote tissue response in athletes.
5. Discuss the physiological basis and therapeutic properties of electrical stimulating currents.
6. Describe how massage, traction, and intermittent compression can be used as therapeutic agents.

Section Q: Rehabilitation Through Therapeutic Exercise

Unit Objective: Identify principles and demonstrate various techniques of the exercise used for the purpose of rehabilitation for an injured athlete.

Unit Competencies:
1. Explain how an athletic trainer would approach rehabilitation for injured athletes.
2. Contrast therapeutic exercise versus exercise for conditioning.
3. Discuss the concept of open versus closed kinetic chain exercises.
4. Examine the consequences of sudden inactivity or injury immobilization for an athlete.
5. Recognize the primary components of a rehabilitation program and create an effective program integrating those components for an injured athlete.
6. Investigate the value of using aquatic stability exercise in rehabilitation.
7. Demonstrate the use of mobilization and traction techniques for improving joint motions.

Section R: Nutrition

Unit Objective: Review learned principles of weight gain, weight loss, nutrient function, supplements and eating disorders from Sports Medicine I and apply those foundations to planning out diet and nutrition strategies for athletes to promote overall health and enhance athletic performance.

Unit Competencies:
1. Describe the major functions of carbohydrates, fats, and protein for the human body.
2. Explain the relationships of good nutrition and diet in enhancing performance and preventing injuries.
3. Investigate the advantages and disadvantages of nutritional supplements in an athlete's diet.
4. Analyze the levels of hydration in athletes and how that varies by sport and individual based on diet.
5. Distinguish between body weight and body composition.
6. Recognize and discuss eating disorders.
7. Evaluate methods for accomplishing healthy weight gain and weight loss.
8. Assess body composition by using skinfold calipers and observe the use of hydrostatic methods to assess body composition.
9. Analyze foods and ingredients that play beneficial roles in pre-activity, during activity and post-activity meals.

Section S: Pharmacology and Drugs in Sports

Unit Objective: Recognize the different classes of drugs commonly used in Sports Medicine and identify their effects on the human body.

Unit Competencies:
1. Describe the major foundations of pharmacology and safety precautions that must be taken for legal reasons in administering drugs to the athletic population.
2. Delineate between prescription and non-prescription (over the counter) drugs.
3. Review the most common drug categories used in Sports Medicine, their active ingredients and their effects on an athlete's body.
4. Explore the use of performance enhancing drugs in sports and discuss the ethical, health, and legal issues involved with the roles they play in athletic enhancement.

Section T: Environmental Considerations

Unit Objective: Be aware of the various external environmental conditions that exist that can influence an athlete's performance and lead to injury and illness.

Unit Competencies:
1. Describe the physiology of hyperthermia and hypothermia.
2. Recognize the signs and symptoms of heat stress and identify methods to prevent heat stress and treat athletes suffering from heat stress.
3. Recognize the signs and symptoms of hypothermia and identify methods to prevent and treat athletes suffering from hypothermia.
4. Compare and contrast the benefits and disadvantages of synthetic turf versus natural turf on incidence of injury.

Section U: Advanced Taping and Wrapping

Unit Objective: Build upon the foundations of taping in Sports Medicine I to use advanced techniques with a greater variety of tapes to be practice and become proficient in assorted tape and wrap applications.

Unit Competencies:
1. Review basic taping and wrapping principles and techniques from Sports Medicine I.
2. Demonstrate proper site preparation for various tapings to different body parts.
3. Demonstrate basic and advanced skills in the use of taping in sports.
4. Demonstrate the skillful application of tape for a variety of musculoskeletal injuries and preventative methods.
5. Apply advanced taping and wrapping techniques in field practice at school athletic events and in the athletic training room with the school's athlete population.

Section V: Kinesiology and Biomechanics

Unit Objective: Demonstrate and interpret the principles involved in the mechanics involved with movements of the human body as related to athletic activities.

Unit Competencies:
1. Explain the kinetic chain of movement.
2. Define and discuss agonist and antagonist movement.
3. Identify methods used to determine muscles imbalances in the body and procedures for correction.
4. Analyze varying gaits between athletes and identify effects of a normal and abnormal gait.
5. Identify techniques used to correct gait abnormalities.

Sections W: Advanced Anatomy

Unit Objective: Review the principles of anatomy as studied in Sports Medicine I and build upon those foundations to further explore the anatomical parts of the body that are often involved in athletic injury and illness.

Unit Competencies:
1. Identify the anatomical structures of the musculoskeletal system.
2. Describe the function of skeletal muscle.
3. Describe the structure and function of the motor unit within the nervous system.
4. Describe the structure and function of the bones of the skeletal system.
5. Discuss the composition of connective tissue such as ligaments, tendons and cartilage.
6. Identify key anatomical landmarks on the body that are used for injury identification, treatment methods, and taping.

LABORATORY ACTIVITIES:
Section C: Creating a Successful Athletic Training Program
- *Design and Athletic Training Room Prep*: Students analyze the data from the previous year's sports medicine class as far as what type of injuries were treated in the training room and which injuries were more common. The students create spreadsheets to look at percentages of what consumable supplies were used in treatments and what pieces of sports medicine equipment were used more frequently. Once analysis of the data is complete the students use this data to prep and design their actual training room on campus in anticipation of what will be most beneficial in treating athlete's on campus. The data collected is also used for students to create monthly supply (i.e. bandages, athletic tape, splints, Gatorade, etc.) inventory reports which will then be used to order new product and determine what items and quantities needed to fit the student's budget limitations. Students keep these records on Google Drive using spreadsheets and forms that are monitored and adjusted throughout the school year to consistently keep the training stocked and supplied.

- *Pre-Activity Concussion Testing:* Students perform a series of neurological tests or activities on athletes that include BESS (Balance Error Scoring System) testing and computer based skills baseline assessment tests. Students will conduct these tests on all of the schools athletes and record the results in a school wide spreadsheet that will be used as baseline results to use in comparison to post tests that will be given if an athlete suffers a possible head injury.

Section D: Professional and Effective Communication

- *Student Athletic Trainer Internship:* Sports Medicine II students complete a I50-hour on campus internship working with sports teams. Every day of the internship involves verbal and written communication with athletes, coaches, parents, and other on-campus staff as part of a very hands-on internship where the students prevent, identify, treat and rehabilitate injuries for the school's athletes. Written communication involves completion of medical injury reports, professional emails to coaches and teachers, and injury record logs. Monthly, students analyze the injury and treatment logs and composes a written report to the sports medicine instructor.

Section H: Athletic Event Field Management

- *Athletic Event Observation and Set-Up:* Student athletic trainers are required to observe at least one game for the various sports on campus before beginning the school year. From this observation they must identify: all necessary pieces of equipment needed to play the sport, unique field/venue features, possible injuries of high occurrence for that sport, essential medical equipment needed to treat injuries, and characteristics of athletes for that specific sport. Post observation, students write a report of what they observed for each sporting event. This report is then used to identify sport specific equipment needs that students will prepare prior to the years sporting events and how they will manage injuries for the sport involving: protective equipment fitting, prophylactic taping, and post injury treatments.

Section J: Sports Equipment and Protective Gear

- *Equipment Fitting Practical:* Students meet with athletes at least two weeks prior to start of the sport's season to analyze the equipment to be used by the athlete. The students will analyze body type, role of athlete and any other variables to assist each athlete in properly fitting and adjusting protective equipment to help prevent injury during the course of athletic participation. This occurs for every athlete and every team before the start of that sport's season. Once the equipment is fitted, students create spreadsheets that document equipment for each athlete and copies of those reports are provided to the sports medicine director and coaches.

Section K: On-the-Field Acute Care and Emergency Procedures

- *CPR Practical:* Students use prior knowledge to demonstrate the correct steps in performing cardiopulmonary resuscitation and analyze the variables involved with making this procedure effective in saving the life of someone in cardiac arrest. Students perform CPR skills practical on manikins.

- *Bleeding/Hemorrhage Control Activity:* In this simulated lab activity students must identify the rate at which some is losing blood via laceration or arterial bleed of some sort. Students use formulas of time bleeding vs. surface area of blood pool to determine volume of blood loss. Calculations are recorded to determine severity of the injury and blood loss and then students perform a

hands-on practical skill of bleeding control. Students perform correct techniques of bleeding control through use of in class bandages and tourniquets while also performing proper techniques of body substance isolation procedures such as glove use and removal.

- *Splinting Activity:* Students identify various fractures and dislocations that would require the use of a splint to treat the injury. Students write out a step- by-step procedure for applying a cardboard, SAM, or air/vacuum splint to an injured extremity. After writing out the procedures students will apply a splint using correct techniques to an assigned body part on an athlete.

- *Transporting Injured Athletes Activity:* Students are given a scenario with athletes with various injuries. Students must identify the injured body part and then construct a plan for moving the athlete to a safe environment without compromising the injured area. Students identify various transporting techniques such as two-man seated carries, drags, human crutch and
  backboard carries and then performs the technique on simulated scenarios.

Section L: Injury Assessment and Evaluation

- *Vital Signs Lab Activity:* Students use specific equipment and techniques to analyze heart rate (pulse), blood pressure, respiratory rate, skin signs, and pupil reactivity. In the activity students perform vital sign recording on other students and athletes by using a sphygmomanometer (blood pressure cuff), stethoscope, and penlight to record a blood pressure, heart rate, respiratory rate, and pupil reactivity. Students measure heart rate and respiratory rate for varying lengths of time and then must use mathematical calculations to come up with an accurate standardized medical record or heartbeats or reparations per minute. After completing the skill students then analyze what is an accepted range for each vital sign and explore the various medical conditions that could cause variance outside of that "normal" range. Students then write a conclusion explaining the physiology behind the causes for elevated or decreased heart rate, respiratory rate or blood pressure.

- *On-Field Injury Assessment Simulation Activity:* In this activity student trainers are sent to a simulated scene where an athlete is injured or ill. Students must use knowledge of HOPS assessment procedures to perform a detailed patient assessment on the athlete to determine possible injuries. Once the skill portion is completed students complete a detailed written assessment medical report to document their findings. This activity will progress later in the year into a follow up assessment in the athletic training room once the athlete is removed from the field of play.

- *Range of Motion Activity:* In this lab-based activity students perform a series of measurements of range of motion for joints of the ankle, knee, shoulder, hip, wrist and elbow.
  Students record degrees of angles in range of motion on other students and

athletes using a goniometer to help determine flexibility and restrictions of range of motion due to injury. Students explore the differences between active and passive range of motion during this lab and then analyze their data to see
if their athlete falls under acceptable or limited range of motion for each given joint. Analysis and conclusions are then made regarding how the student might create exercises or activities that would promote range of motion for each joint.

- *Joint Special Tests Activity:* Students are assigned one of the major joints of the body (shoulder, elbow, wrist, hip, knee, ankle) and must research special tests used to assess various musculoskeletal injuries to that area of the body. Once the special tests are researched they must be performed on a partner in class and a report is written explaining how that specific test evaluates for a particular injury and anatomically what is being tested on the body.

Section M: Blood borne Pathogens and Standard Precautions

- *Universal Precautions Activity:* Students review the universal precautions against transmission of blood borne pathogens such as gloves, eye protection, facial protection and gowns. Students are given a simulated injury scene with simulated blood and they must demonstrate the proper precautions against blood borne pathogen transmission including proper glove removal.

Section N: Training and Conditioning Techniques

- *Muscle Fatigue Lab:* Students utilize the school weight room to perform a variety of weight lifting activities that are vary common in sport strength straining programs. After exploring these activities, students must identify which exercises isolate specific muscle groups. Students will record data for each individual muscle group that includes numbers of repetitions, sets and amount of weight needed to fatigue the muscle. Once data is collected students analyze the data to determine percentages of use that fatigue each muscle group and in turn determine conclusions on which muscles groups offer the greatest amount of strength for the arms, legs and body core.

- *Physical Ability Testing:* Students find an athlete on campus and put the athlete through a physical ability-testing program. The student has the athlete complete a series of seven physical tests including flexibility, strength and endurance tests. The sports med student then evaluates the athlete's strength and conditioning based on the results of the tests and data collected. The student then analyzes the data in comparison to other athletes in the same sport and of similar body type. Once comparisons have been completed the student creates a strength and conditioning plan for the athlete and monitors their progress over the course of a month.

Section P: Therapeutic Modalities

- *Cryotherapy and Thermotherapy Lab Activity:* In this activity students will investigate the effectiveness of using cryotherapy (cold) and thermotherapy

(heat) techniques as therapeutic treatment for the body's tissues. Students perform tests on various methods of cryotherapy such as ice bath immersion and ice bag with compression and thermotherapy such as heat packs and hydro collator packs. Data is then recorded regarding skin temperature and sensation felt by the athlete. Students then graph and analyze their data to determine conclusions on what methods of therapy are most effective on accomplishing manipulation of tissue to perform a specific therapeutic effect. Students then conclude why and when you would use cryotherapy and thermotherapy in the treatment of athletes.

- *Electrical Stimulation Practical:* Students will demonstrate the proper use of EMS (electrical muscle stimulators) and TENS (transcutaneous electrical nerve stimulation) in a therapeutic process. Students practice using EMS/TENS units and record data collected from an athlete when various levels of electrical current are passed through the muscles of the quadriceps, biceps, triceps and gastrocnemius. Students then analyze the data to determine what the proper amount of electrical stimulation would be to aid in rehabilitation of muscle atrophy and pain management.

Section Q: Rehabilitation Through Therapeutic Exercise

- *Rehabilitation Exercise Practical Activity:* In this activity students are assigned a specific part of the body (ankle, knee, hip, back, shoulder, wrist) and must create a functional rehabilitation plan based on therapeutic exercise techniques. Students use training room and weight room equipment such as Physioballs, medicine balls, free weights and resistance bands to practice various exercise developed by the student. When exploring these exercises the student must record the muscle groups that are being addressed and then determine which exercises would be beneficial to rehabilitate their assigned injured body area. Once all of the exercise investigation is complete each student completes a ten-exercise rehabilitation plan for an athlete that would have injuries specific to his or her assigned body part. Students create a presentation that will be used during the year to demonstrate and inform any athlete that may incur any of the assigned injuries.

Section R: Nutrition

- *Nutrition Analysis Activity:* Students track their diet for one week using the program *Super Tracker* at myplate.gov. This program gives them a report that breaks down their consumed food into nutritional categories such as calorie, protein and fat intake. Students then use this data to analyze their diet and determine whether they are meeting recommended percentages for caloric and nutrient intake. After analyzing the data they graph and write out a report on their conclusions, which also includes positive and negative effects on the body shown by the data for their diet.

- *Hydration Lab:* Students perform calculations using body weight, height and activity levels to determine the amount of water that is needed through a day

for an assigned athlete. Once they have that data they look more closely at what quantities of water need to be consumed at various stages of activity (pre-activity, during activity, post-activity). Students then go with their athlete to a sporting event and weigh the athlete prior to the activity and after the activity to determine amounts of weight loss due to water loss and then determine if their athlete has remained hydrated throughout the activity. Based on the data collected from this lab the student then must create a plan for the athlete to increase or maintain proper hydration levels through water consumption.

Section U: Advanced Taping and Wrapping

- *Various Taping and Wrapping Activities:* Throughout the school year students perform taping and wrapping techniques on each other and athletes as part of their field internship. Students keep a taping notebook, which includes their own written procedures, drawings and diagrams of the taping and purposes for each taping. Students have a skills sign off packet for their tapings in which they must complete a minimum of three tapings or wrappings for each technique (ankle taping, turf toe taping, low-dye taping, Achilles tendon taping, thigh wrapping, groin wrapping, shoulder wrapping, elbow hyperextension taping, wrist taping, wrist hyperextension taping, thumb taping, buddy taping) that is observed by the sports medicine teacher. Once the student has shown understanding and competence in each taping they will be allowed to apply taping techniques to athletes as part of the internship program. Each taping skill is documented by the student including a report with reason for completing the taping treatment and goals wanting to be accomplished by the treatment. These activities build upon foundations learned in Sports Medicine I and include more advanced taping techniques and an increased variety of tapes used for more specific and advanced techniques.

Section V: Kinesiology and Biomechanics

- *Range of Motion Activity:* In this lab-based activity students perform a series of measurements of range of motion for joints of the ankle, knee, shoulder, hip, wrist and elbow.
  Students record degrees of angles in range of motion on other students and athletes using a goniometer to help determine flexibility and restrictions of range of motion due to injury. Students explore the differences between active and passive range of motion during this lab and then analyze their data to see if their athlete falls under acceptable or limited range of motion for each given joint. Analysis and conclusions are then made regarding how the student might create exercises or activities that would promote range of motion for each joint.

- *Joint Special Tests Activity:* Students are assigned one of the major joints of the body (shoulder, elbow, wrist, hip, knee, ankle) and must research special tests used to assess various musculoskeletal injuries to that area of the body. Once the special tests are researched they must be performed on a partner in class and a report is written explaining how that specific test evaluates for a particular injury and anatomically what is being tested on the body.

KEY ASSIGNMENTS:

Section A: Orientation

- Students will write a 300 word essay outlining their path through the medical and biotechnology academy sequence and explaining the topics learned at each grade level through the academy.

- Students will create multiple charts that show the progression of classes through the medical academy pathway. These charts will depict progression of classes and classes needed for graduation and application to state colleges.

- Students will review the Sports Medicine II handbook that includes safety procedures, protocol for internship program, skills competencies and class requirements.

Section B: Advanced Foundations in Athletic Training

- Students research the various professional organizations in sports medicine such as NATA and CATA and write a 400-word essay explaining the various roles of these organizations in regulating athletic trainers.
- Students are to visit a local college or university that offers a program in a sports medicine related field and write a 300 word essay that lays out the requirements needed to attend that institution.
- Students complete a graphic organizer that compares and contrasts the different personnel involved in a sports medicine program and how they work together to form the medical umbrella of "sports medicine."

Section C: Creating a Successful Athletic Training Program

- Students create a spreadsheet that lists the equipment and supplies needed to create functional high school level athletic training room and then write a 400 word essay making a claim as to why the listed equipment and supplies play an integral role in maintain a successful athletic training room.
- Students meet as a team to create posters for the training room that outline procedures and rules for athletes that visit the training room.
- Students meet in groups to create digital forms/spreadsheets to track inventory of athletic training room supplies.
- Budget Project: Students are given a budget for the entire school year. After identifying supply and equipment needs from previous assignment students must plan out future orders and expenditures based on available budget and must prioritize needs for the athletic training room. This is completed by creating spreadsheets that list monthly orders to a supplier and a written essay that describes why the items ordered were prioritized and how quantities were determined based on previous year's usage.
- Students perform an activity in which they rotate stations (bandaging, taping,

exercise/therapy, splinting, whirlpool, ice/heat) in the athletic training and must demonstrate competency in using the equipment set up at each station. Students will verbalize the purpose, goals and procedures for using the equipment.

Section D: Professional and Effective Communication

- Students will create a short dialogue in groups that demonstrates their understanding of medical terminology by using the proper vocabulary found in a healthcare facility or environment.
- Students use online resources and textbook to investigate how to properly complete an injury report including SOAP notes. Students will then practice filling out these injury reports throughout the year when documenting injuries to athletes on campus.
- Students will be given a hypothetical athletic injury situation. In pairs, one student will role-play as the injured athlete and the other as the student athletic trainer. Based upon the responses given by the inured athlete, the students must create an accurate injury report form to submit to the school's athletic trainer.

Section F: Roles of Responsibilities of the Athletic Trainer Student Aid

- Students write a 400-word essay in response to reading the sports medicine student trainer handbook, which outlines the roles of all members of the student athletic trainer team.
- Students set up a professional meeting via phone or email with the coaching staff of each sport on campus at the beginning of the year to discuss their role at athletic events and open the lines of communication between coaches and sports medicine student trainers.
- In groups, students brainstorm and complete a graphic organizer that outlines the key responsibilities of students during shifts in the athletic training room.
- Students write a 300-word essay addressing the prompt "What is an appropriate relationship between a student athletic trainer and their peers who are athletes?"

Section G: Legal and Ethical Concerns in Sports Medicine

- Students research the laws of RIPPA in their textbook and online and write a 300 word essay regarding the importance of patient privacy and how they will strive to maintain the privacy of all those that they treat.
- Students complete a vocabulary assignment defining legal terminology (negligence, liability, scope of practice, assumption of risk) and then write a 200-word essay describing a scenario in process of athletic training in which these terms may arise.
- Students research online the laws regarding product liability for protective equipment in sports and then check the equipment for their assigned sports to guarantee that the equipment meets those standards and documents all equipment in a spreadsheet with the results.

Section H: Athletic Event Field Management

- Students visit each athletic venue on campus and write a 300-word essay explaining how they would set up a station for the athletic trainer at each venue.
- Students create a checklist form on Google Drive that documents the sports medicine equipment needed for each sport and venue on campus.
- Students use graphic organizers to complete a compare and contrast of equipment needed for practices versus games and home events versus away events for all sports on campus.

Section I: Emergency Action Plan and Preparedness

- Students research various emergency action plans for high school, college, and professional sports venues and take notes in graphic organizers for comparison to our school.
- In teams, students create a functional Emergency Action Plan for the campus that includes individual plans for each athletic venue. Students must complete emergency information cards for each athlete, a PowerPoint presentation describing venue emergency plans, maps for emergency access to each venue, protocol for calling 911 and roles of each member of the sports medicine staff, and binders that contain all of the stated emergency protocols for each coach on campus.

Section J: Sports Equipment and Protective Gear

- Students must use their textbooks and computers to research all of the protective equipment available to athletes that participate in their assigned sports. After becoming knowledgeable in the protective equipment for their sport, the group must create a PowerPoint that will teach other students and the athletes about the uses of the equipment and demonstrate how to properly fit the equipment to an athlete.
- During the student trainer internship, the students assist coaches in the fitting and documentation of equipment handed out to individual athletes including football helmets, football shoulder pads, baseball helmets, and any optional protective equipment that is checked out through the athletic training room. This information will be documented by students in Google Drive as a shared spreadsheet so that it can be accessed by all members of the sports medicine staff and coaches.
- Students perform an activity where various knee, ankle, wrist and elbow braces and pads are used to practice fitting to athletes. Students then will write a 300-word essay describing how the brace effectively helps prevent injury or protect an injured body part.
- Students write a 400-word essay that compares and contrasts the advantages and disadvantages of customized ankle and knee protective braces versus off-the-shelf models.

Section K: On-the-Field Acute Care and Emergency Procedures

- Students participate in a role-play scenario in which they demonstrate proper assessment techniques for injury evaluation and follow a written procedure for patient/athlete assessment.
- Students complete accurate SOAP notes and HOPS forms for a given list of 10 injury scenarios.

- In groups, students will create a "how to" video, poster, diagram, website, or PowerPoint for how to perform CPR or any other first aid technique learned in the CPR/first aid certification portion of the class.
- Students create a poster or video demonstrating the steps of completing one of the basic vital sign skills (blood pressure, pulse, pupil reactivity, respiratory rate/quality).
- In groups, students complete an analysis of all the possible injuries to an assigned body part. Students research all treatments for possible injuries and then create a 3-minute video demonstrating the treatments for those injuries that may include a taping, first aid technique or rehabilitation exercises demonstration.
- Students demonstrate how to properly immobilize an athlete with a spinal injury through the steps of a c-spine procedure.

Section L: Injury Assessment and Evaluation

- Students participate in a role-play scenario in which they demonstrate proper assessment techniques for injury evaluation and follow a written procedure for patient/athlete assessment.
- Students complete accurate SOAP notes and HOPS forms for a given list of 10 injury scenarios.
- Students research "special tests" for evaluation of a joint and demonstrate the performing of those special tests in class on an athlete that has suffered an injury.

Section M: Blood borne Pathogens and Standard Precautions

- Students create a flipbook demonstrating the proper use and removal of gloves as a precaution against blood and bodily fluids.
- Students research online the current OSHA precautions related to emergency field medicine and outline their notes in a graphic organizer.
- Students use the textbook and online research to write 300-word essay describing the proper disposal of biohazard and sharps.

Section N: Training and Conditioning Techniques

- Students read a journal article "12 Common Mistake of High School Strength and Conditioning Program" and then write a 500 word essay addressing how these mistakes could be addressed in a program for their sport's athletes.
- Students create a functional "warm-up" and "cool-down" procedure for their assigned sports and create a poster and presentation that will be presented to the coaches and athletes for each sport.
- Students research beneficial exercises for an assigned sport to enhance performance and then create a 10-exercise workout program to promote strength and flexibility that is displayed in a PowerPoint presentation.

Section 0: Pathology of Sports Injuries

- Students define the terms ligament, tendon, muscle, cartilage and bone and then complete a graphic organizer that lays out the differences between each type of tissue and the specific functions of each in the human body.

- Students examine a series of X-rays and write a 300-word essay explaining the different types of fractures that are displayed and what characteristics distinguish each fracture.
- Students complete an activity where they create joints using chopsticks as bones and then use their models to demonstrate the various types of stress (torsion, tension, compression, shearing) placed on bone and joints and observe how the joint will be injured based on applying those forces to their model.

Section P: Therapeutic Modalities

- Students use the textbook and online research to determine the benefits of electrical muscle stimulation and write a 400-word essay describing how EMS may be used to retard muscle atrophy and promote muscle growth.
- Students create a book with procedures and diagrams on the proper application of cryotherapy and thermotherapy such as ice bath immersion, ice/heat pack application and whirlpool use for athletes.

Section Q: Rehabilitation Through Therapeutic Exercise

- Students are assigned an athlete with a shoulder, knee or ankle injury. The student must create a functional 3 month rehabilitation program that outlines the phases of acute care, early exercises, immediate exercises, advanced exercises and sport specific exercises that will result in a full recovery to play. Products of this assignment are a poster demonstrating the exercises and PowerPoint outlining the sequence and time frames for each phase of rehabilitation.
- Students complete a compare and contrast graphic organizer comparing and contrasting exercise for rehabilitation versus exercise for conditioning.
- Students write a 400-word essay addressing the prompt "Describe the dangers of inactivity for an athlete following a musculoskeletal injury."
- Students use the campus pool to demonstrate techniques in rehabilitation exercise that can be performed in an aquatic environment.
- Students write a 300-word essay addressing the benefits of traction on the joints and bones prior to and following injury.

Section R: Nutrition

- Students use BMI (body mass index) charts to determine the BMI of well-known athletes and write a 300-word essay describing why BMI charts are often times inaccurate.
- Students complete a hydration calculation worksheet that shows the methods in determining proper hydration levels for athletes based on height, weight and activity levels.
- Students are assigned a fictitious athlete that has a goal to enhance their performance (i.e. weight loss, weight gain, muscle gain, etc.) and they must create a menu for one week's duration that will meet the nutritional requirements in caloric intake, protein and fat levels to meet this athlete's goals. Students create a menu in a spreadsheet, a 600-word essay describing how their menu meets the needs for their athlete, and nutritional report that is supplied by *Super Tracker* on myplate.gov based on their menu being entered into the program.

Section S: Pharmacology and Drugs in Sports

- Students write a 600 word persuasive essay in response to a journal article about performance enhancing drugs in professional sports. Half of the students address the topic as the athlete that is using PEDS while the other half address the article as the organizations testing for performance enhancing drugs.
- Students create a poster depicting the different classifications of drugs used as treatments and performance enhancers and how they affect the athlete's body.

Section T: Environmental Considerations

- Students use online research to explore the differences between artificial turf, field turf and natural turf (grass).
- Students create a PowerPoint presentation that displays the characteristics of artificial turf and natural turf and presents this to the athletes while communicating the importance of wearing the proper shoes on each surface and encourage the athletes to get the proper footwear for each surface.

Section U: Advanced Taping and Wrapping

- Students complete a skills packet on advanced taping and wrapping techniques (Achilles tendon taping, ankle taping, patellar tendon taping, low- dye taping, groin wrap, thigh wrap, turf toe taping, elbow hyperextension taping, thumb taping).
- Students create a poster that displays the different types of tape in sports medicine and lists the uses for each type of tape.
- Students apply taping skills in the internship portion of the class, taping and wrapping the school's athletes for practices and games.

Section V: Kinesiology and Biomechanics

- Students perform a gait analysis on a sample of athletes. Students measure the length of gait and properties of the athletes gait and then analyze the recorded data to determine the athlete's gait properties and compare them to proper gait. Students then create a written report to give to the athlete's to discuss the effects of their gait on performance and possible injury.
- Students create a handout with a functional plan to correct improper gait for heel walking, toe walking or muscle imbalance.
- Students create a visual diagram showing the difference between agonist and antagonist muscle movement through various exercises that demonstrate each.

Sections W: Advanced Anatomy

- Students use sticker dots to label anatomical landmarks of the foot and ankle, knee, pelvis, shoulder, wrist and hand on a partner in class.
- Students complete a table in which they must identify the major skeletal muscle groups of each part of the body and describe what movement is created by the contraction of that muscle.
- Students complete a patellar reflex activity and must write a short 200 word essay describing how reflexes help protect athletes during activity.
- Students use various colored pieces of yarn to attach to a skeletal muscle to

identify connective tissue in the body with different colors representing ligaments, tendons and fascia.

INSTRUCTIONS METHODS and/or STRATEGIES:

A. Lecture, PowerPoint Presentations, and Class Discussion
- All topics covered in the course outline are presented to the class through the above methods. Lecture and PowerPoints are designed to provide students with frontloaded information regarding covered topics and class discussions will include teacher guided questions, role-play, student questions, critical thinking, and problem-solving tasks.

B. Visual Aids
- Anatomical human models, charts, diagrams, graphs, photographs, and videos will be used throughout the lectures and discussions to emphasize key topics listed in the course outline section.

C. Hands-On Activities/Skills Labs
- A major portion of this course is taught in a hands-on and practical skills method. So much of the content is skills based that students need to be able to demonstrate the ability to perform a technique or skill to truly obtain the learning objective. Students will learn through hands-on activities such as taping, wrapping, performing CPR demos, administering first aid treatments, testing for injuries by applying stress tests, checking for vital signs, and administration of treatments for particular athletic injuries.

D. Internship
- A major portion of this course is the senior level internship that makes up 150 hours outside of school hours. In this internship students apply practical skills of taping, wrapping, 1st aid, rehabilitation, therapeutic modalities, injury documentation and exercise physiology to the student athletes on campus. This internship is performed under the supervision of the sports medicine director and serves as the major practical application of sports medicine and athletic training theory.

E. Demonstration
- Teacher will demonstrate many of the techniques and skills to be learned as a visual modality prior to students performing the hands-on application.

F. Labs
- Skills labs for taping, wrapping, and injury treatment will be performed throughout the year in which students must look as visual data or signs to problem solve and come to a conclusion as to how to treat the athlete.

G. Independent Research

- Students will research varying topics throughout the school year as pertaining to the anatomical topics learned as well as for major projects such as the healthcare career project as part of their cross-curricular academy projects.

H. DVDs/Video
- Video clips, documentaries, and instructional videos will be used to emphasize content in a visual format and as real life application to content covered during lecture.

ASSESSMENTS INCLUDING METHODS and/or TOOLS

A. Written Assignments
Writing assignments will show student competencies in sports medicine by using proper spelling of medical terms and abbreviations at all times. Essays and class writings will be assessed for proper spelling and grammar and students are expected to write in complete sentences and paragraph format for all written response. Vocabulary writing assignments will be looked at with the intent that students have a greater meaning of key medical vocabulary terms.

B. Written Tests/Quizzes
Written tests and quizzes will be used to assess the student's content understanding and ability to process the information expected to be learned and demonstrate understanding of its meaning in written form.

C. Group/Individual Projects

Projects will be used as tool for students to find deeper meaning in topics covered throughout the year and will be assessed on the idea that the project reinforced content learning expectations if completed by the student or group.

D. Observation
Informal observation will be used to assess students learning in skills based applications such as taping and treatment skills as they are covered during the course.

E. Evaluation of Practical Hands-On Skills
Will be used as formal assessment of the student taking in information verbally and visually and being able to process the information and repeat it in steps that will be applied to a practical purpose of treatment to an injury. This formal evaluation will be used to show that the student has mastered key hands-on sports medicine skills throughout the course.

Evaluation of Internship Students are observed and evaluated based on practical performance in real-life medical based applications of working with the school's athletes in the role of an assistant student athletic trainer. Informal observation will be used to assess students along with weekly internship reports and any documentation turned in by student interns in the form of injury reports, logs, and athletic training room inventory reports.

INSTRUCTIONAL MATERIALS:

Textbooks:
Title: Principles of Athletic Training: A Competency Based Approach
Edition: 14th
Publication Date: 2011
Publisher: McGraw-Hill
Author(s): Prentice, William and Arnheim, Daniel
Usage: Primary Text
Covered in its near entirety during the course of the year.

Title: Orthopedic Taping, Wrapping, Bracing & Padding
Edition: 1st
Publication Date: 2006
Publisher: F.A. Davis Company
Author(s): Beam, Joel W. Usage:
Secondary Text
Approximately 50 pages used as reference for lab practicals in taping, wrapping and bracing.

Title: Guidelines for CPR, First Aid and AED for Community Rescuers
Edition: 2010
Publication Date: 2010
Publisher: EMS Safety Services, Inc.
Usage: Primary Text
Covered in its entirety during CPR and First Aid certification portion of the course.

Title: Anatomy Coloring Book
Edition: 4th
Publication Date: 2011
Publisher: Kaplan Inc.
Author(s): McCann, Stephanie and Wise, Eric
Usage: Secondary Text
Used as visual reinforcement for anatomical lessons and labeling.
Approximate number of pages: 80

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2. Sandy-Johnson Shaw

3. Marie Schirmer, School Support Administrator