

**University of Nevada Las Vegas  
School of Dental Medicine**

**COURSE SYLLABUS**

**ORTH 8512 - Biomechanics**

Credit Hours: 2

Contact Hours: 30

**1) GENERAL INFORMATION**

- a. Course Director: Dr. James Mah
- b. Course Director Email: james.mah@unlv.edu
- c. Office Location: Building D, Room D245
- d. Office Telephone Number: (702) 774-2535
- e. Department: Clinical Sciences
- f. Type: Required
- g. Day and Time: Tuesday, 10:00-11:00 am  
**Schedule is fluid and subject to change due to the COVID-19 pandemic**
- h. Location(s):
- i. Office Hours: M-F, 9 am to 5 pm, email for appointment

**2) COURSE DESCRIPTION**

This course is an introduction to the fundamentals of orthodontic biomechanics. It provides a broad overview of orthodontic appliances and their utilization. The general stages of orthodontic treatment will be presented and discussed (leveling and alignment, space closure, finishing, retention).

- a. **Prerequisites**
  - i. DDS/DMD degree
  - ii. Enrollment in an Advanced Education Program in Orthodontics & Dentofacial Orthopedics at UNLV SDM

**3) LEARNING RESOURCES**

- a. Required Readings
  - i. Systemized Orthodontic Treatment Mechanics by McLaughlin, Bennett, Trevisi, 2014
- b. Recommended Readings –on network drive
- c. Online  
<http://www.authorstream.com/Presentation/indiandentalacademy-2149279-evolution-orthodontic-brackets-fixed-courses-ida/>

**4) PARTICIPATING FACULTY**

- a. Dr. James Mah

**5) COURSE STUDENT LEARNING OUTCOMES (SLOs)**

At the conclusion of this course, the resident will be able to:

1. Discuss basic biomechanical principles used in orthodontic treatment
2. Describe various differential force systems, identify and calculate vectors and moments involved in tooth movement
3. Differentiate between various orthodontic treatment techniques and appliance systems
4. Identify Andrew's Keys to occlusion
5. Understand anchorage preparation, its importance, types and applicability in orthodontics
6. Describe management of vertical problems, i.e. open/deep bites malocclusions
7. Identify and understand manipulation of extraoral appliances
8. Describe management of AP problems, i.e. extraction space closure, elastics
9. Identify problems and techniques used in finishing

**6) CODA STANDARDS ADDRESSED**

- a. Standard 4. Is the advanced dental education program designed to provide special knowledge and skills beyond the D.D.S. or D.M.D. training and oriented to the accepted standards of the discipline's practice as set forth in the Accreditation Standards?
- b. Standard 4. Does the program include instruction or learning experiences in evidence-based practice, as set forth in the Accreditation Standards?
- c. Standard 4-3.1. Is orthodontic treatment evidence-based?
- d. Standard 4-3.2. Does the advanced dental education program in orthodontics and dentofacial orthopedics require extensive and comprehensive clinical experience, which is representative of the character of orthodontic problems encountered in private practice?
- e. Standard 4.3-3. Does experience include treatment of all types of malocclusion, whether in the permanent or transitional dentitions?
- f. Standard 4-3.4. Treat patients with at least one contemporary orthodontic technique?
- g. Standard 4-3.4. Develop and document treatment plans using sound principles of appliance design and biomechanics?
- h. Standard 4-3.4. Study and critically evaluate the literature and other information pertaining to this field?

**7) EVALUATION**

- a. Grading Scale
  - A = 90-100
  - B = 80-89.9

C = 70-79.9

F = below 70

(Courses that are satisfactory/fail – must indicate here)

- b. Examinations/Quizzes: This course includes 14 quizzes and a final exam. The written exams and quizzes may include multiple choice, true/false, short answer, questions.
- c. Grade Determination:
  - i. 50% Final (Written) Exam
  - ii. 40% Quizzes
  - iii. 10% Attendance and Professionalism
- d. Posting/Notification of Grades: Grades for exams, assignments, and quizzes will be available within 10 business days of the final exam or assignment submission.
- e. Professionalism: As outlined in the UNLV SDM Student Handbook: UNLV School of Dental Medicine Student Code of Professional Responsibilities and Appendices outline the professional behavior expected of students attending UNLV SDM. Failure to act in a professional manner, as determined by faculty, may affect a course grade. Unprofessional conduct may result in failure of course.
- f. Extra Credit: N/A
- g. Remediation: This course offers post-course remediation. Whether the need for remediation is identified by the student or the instructor, the student is encouraged to contact the course director to discuss areas of weakness and performance plans to re-learn or practice skills prior to re-assessment. Post-course remediation is contingent upon the protocol outlined in the Student Handbook.

### 8) COURSE SCHEDULE (INSTRUCTIONAL SESSIONS)

Session	Topic	Instructor
1	Chapter I. History of Orthodontics	Dr. Mah
2	Chapter II. Appliance Specifications	Dr. Mah
3	Chapter III. Bracket Positioning	Dr. Mah
4	Bonding and Debonding (Chapter XI. Appliance Removal)	Dr. Mah
5	Chapter IV. Arch Form	Dr. Mah
6	Chapter V. Anchorage Control	Dr. Mah
7	Chapter VI. Arch Leveling and Overbite Control	Dr. Mah
8	Chapter IX. Space Closure and Sliding Mechanics	Dr. Mah

9	Chapter VII. Class II	Dr. Mah
10	Chapter VIII. Class III	Dr. Mah
11	Chapter X. Finishing the Case	Dr. Mah
12	Class II Correctors (Part I)	Dr. Mah
13	Class II Correctors (Part II)	Dr. Mah
14	<b>Final Exam</b>	Dr. Mah

9) **SPECIFIC CLASS POLICIES AND PROCEDURES**

**This course abides by the policies and procedures outlined in the most current version of the UNLV SDM Student Handbook.**

- a. Electronic Devices in the Classroom: Audio and video recording devices of classroom activity (**to include remote administration**) may occur only with advanced written permission from the course director and the presenter if the presenter is not the course director.

10) **UNIVERSITY WIDE POLICIES/PROCEDURES (Do not change anything in this section. These are mandated by the University).**

a. **Public Health Directives**

Face coverings are mandatory for all faculty and students in the classroom. Students must follow all active UNLV public health directives while enrolled in this class. [UNLV public health directives](https://www.unlv.edu/coronavirus/health-requirements) are found at <https://www.unlv.edu/coronavirus/health-requirements>. Students who do not comply with these directives may be asked to leave the classroom. Refusal to follow the guidelines may result in further disciplinary action according to the [UNLV Code of Student Conduct](https://www.unlv.edu/sites/default/files/page_files/27/StudentConduct-Code.pdf), [https://www.unlv.edu/sites/default/files/page\\_files/27/StudentConduct-Code.pdf](https://www.unlv.edu/sites/default/files/page_files/27/StudentConduct-Code.pdf), including being administratively withdrawn from the course.

b. **Academic Misconduct**

Academic integrity is a legitimate concern for every member of the University community. We all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility, and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy, and are encouraged to always take the ethical path whenever faced with choices. Students enrolling at UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's educational mission. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another person,

from the Internet or any other source without proper citation of the source(s). See the [Student Conduct Code](https://www.unlv.edu/studentconduct/student-conduct), <https://www.unlv.edu/studentconduct/student-conduct>.

**c. Falsification of Documents or Other Information**

The UNLV Student Conduct Code and the UNLV School of Dental Medicine prohibits the forgery and falsification of any documents or records. This includes, but is not limited to, the forging, altering, misusing, providing or causing any false information to be entered on ANY University or School of Dental Medicine PRINTED OR ELECTRONIC documents, records (including patient records), or identification cards. The falsification of data, improper assignment of authorship of school work or other scholarly activity, claiming another person's work as one's own, unprofessional manipulation of experiments or of research procedures, or misappropriation of research funds will not be tolerated. Commission of any act of forgery or falsification as described will result in disciplinary action and sanctions as stated in the School of Dental Medicine Honor Code.

**d. Consensual Relationships**

UNLV prohibits romantic or sexual relationships between members of the university community when one of the individuals involved has direct professional influence or direct authority over the other. For further information, go to <http://hr.unlv.edu/Policy/consensual.html>.

**e. Observance of Religious Holidays**

As a general rule, a student missing a class or laboratory assignment because of observance of a religious holiday shall have the opportunity to make up missed work. **Students must notify the course director of anticipated absences by the last day of late registration to be assured of this opportunity.** Faculty may give students an additional week to complete missed work, but must set a clear deadline. Note: Student who represent UNLV SDM at any official extracurricular activity shall also have the opportunity to make up assignments, but the student must provide official written notification to the instructor no less than one week prior to the missed class(es).

**f. Classroom Conduct**

Students have a responsibility to conduct themselves in class and in the libraries in ways that do not interfere with the rights of other students to learn, or of instructors to teach. Use of electronic devices such as pagers, cellular phones, or recording devices, or potentially disruptive devices or activities are only permitted with the prior explicit consent of the instructor. The instructor may rescind permission at any time during the class. If a student does not comply with established requirements or obstructs the functioning of the class, the instructor may initiate an administrative withdrawal of the student from the course.

**g. Copyright**

The University requires all members of the University Community to familiarize themselves with, and to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The University will neither protect nor defend you, nor assume any responsibility for employee or student violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional [copyright policy information](https://www.unlv.edu/provost/copyright) is available at <https://www.unlv.edu/provost/copyright>.

**h. Disability Resource Center (DRC)**

The [UNLV Disability Resource Center](https://www.unlv.edu/drc) (SSC-A, Room 143, <https://www.unlv.edu/drc>, telephone 702-895-0866) provides resources for students with disabilities. Students who believe that they may need academic accommodations due to injury, disability, or due to pregnancy should contact the DRC as early as possible in the academic term. A Disabilities Specialist will discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours, so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

**i. Identity Verification in Online Courses**

All UNLV students must use their Campus-issued ACE ID and password to log in to WebCampus-Canvas. UNLV students enrolled in online or hybrid courses are expected to read and adhere to the [Student Academic Misconduct Policy](https://www.unlv.edu/studentconduct/misconduct/policy), <https://www.unlv.edu/studentconduct/misconduct/policy>, which states that “acting or attempting to act as a substitute for another, or using or attempting to use a substitute, in any academic evaluation or assignment” is a form of academic misconduct. Intentionally sharing ACE login credentials with another person may be considered an attempt to use a substitute, and could result in investigation and sanctions, as outlined in the Student Academic Misconduct Policy. UNLV students enrolled in online courses are also expected to read and adhere to the [Acceptable Use of Computing and Information Technology Resources Policy](https://www.it.unlv.edu/policies/acceptable-use-computing-and-information-technology-resources-policy), <https://www.it.unlv.edu/policies/acceptable-use-computing-and-information-technology-resources-policy>, which prohibits sharing university accounts with other persons without authorization. To the greatest extent possible, all graded assignments and assessments in UNLV online courses should be hosted in WebCampus-Canvas or another UNLV-managed platform that requires ACE login credentials for access. Instructions for course that use remote examinations can be found under Administration of Remote Exams section above.

**j. Incomplete Grades**

The grade of “I” (Incomplete) may be granted when a student cannot complete the course for reason(s) beyond the student’s and/or school’s control in accordance with the UNLV Dental Medicine handbook. Graduate students receiving “I” grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the period indicated, a grade of “F” will be recorded, and the student’s GPA will be adjusted accordingly. Students who are fulfilling an Incomplete grade do not register for the course, but make individual arrangements with the instructor who assigned the “I” grade.

**k. Library Resources**

Librarians are available to consult with students on research needs, including developing research topics, finding information, and evaluating sources. To make an appointment with a subject expert for this class, please visit the [Libraries’ Research Consultation](#) website, <https://guides.library.unlv.edu/appointments/librarian>. You can also [ask the library staff](#) questions via chat and text message at <https://ask.library.unlv.edu/>.

**l. Rebelmail**

Rebelmail is UNLV’s official email system for students and by University policy, instructors and staff should only send emails to students’ Rebelmail accounts. Rebelmail is one of the primary ways in which students receive official University communications, information about deadlines, major Campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the University. Emailing within WebCampus-Canvas is also acceptable.

**m. Tutoring**

The Academic Success Center (ASC) provides tutoring and academic assistance for all UNLV students taking UNLV courses. Students are encouraged to stop by the ASC to learn more about subjects offered, tutoring times and other academic resources. The ASC is located across from the Student Services Complex, #22 on the current UNLV map. Students may learn more about tutoring services by calling: 895-3177 or visiting the tutoring web site at: <http://academicsuccess.unlv.edu/tutoring/>.

**n. UNLV Writing Center**

One-on-one or small group assistance with writing is available free of charge to UNLV students at the [Writing Center](#), <https://writingcenter.unlv.edu/>, located in the Central Desert Complex, Building 3, Room 301 (CDC 3–301). Walk-in consultations are sometimes available, but students with appointments receive priority assistance. Students may make appointments in person or by calling the Center, telephone 702-895-3908. Students are requested to bring to their appointments their Rebel ID Card, a copy of the instructions for their assignment, and two copies of any writing they have completed on their assignment.

**o. Diversity Statement**

As an institution of higher learning, UNLV represents a rich diversity of human beings among its faculty, staff, and students, and is committed to aspiring to maintain a Campus environment that values that diversity. Accordingly, the University supports understanding and appreciation of all members of its community, regardless of race, sex, age, color, national origin, ethnicity, creed, religion, disability, sexual orientation, gender, gender identity, marital status, pregnancy, genetic information, veteran status, or political affiliation. Please see [University Statements and Compliance, https://www.unlv.edu/about/statements-compliance](https://www.unlv.edu/about/statements-compliance). A successful learning experience requires mutual respect and trust between the students and the instructor. Accordingly, the instructor asks that students be willing to listen to one another's points of view, acknowledging that there may be disagreements, keep discussion and comments on topic, and use first person, positive language when expressing their perspectives.