

**Instructor: Duncan Mahoney**

**Office: TTL 102**

**Office Hours: M-F, 10AM-1PM by appointment**

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### Course Description and Overview

To instruct students in advanced technical direction topics involving the technical analysis and design of moving scenery and theatrical systems.

### Learning Objectives

Students will learn to:

- Mathematically analyze the forces acting on moving theatrical systems and scenic elements
- Specify materials and equipment appropriate for the stress levels to use in those systems and elements
- Develop basic documentation and shop drawings for dynamic theatrical scenery systems
- Evaluate the safety and risk issues in a particular theatrical automation system.

### Recommended Preparation: Thtr 438

**Required Texts:** Mechanical Design for the Stage, Alan Hendrickson (MDS).  
Scenic Automation Handbook, Gareth Conner (SAH)

**Grading:** 50% homework assignments, 20% midterm, 30% final exam. Overall grading may be curved. I expect homework and exams to be complete, with all steps shown in calculations. Consult the examples in the textbook if you have questions about the process or equations to use. Remember that you may have to use procedures learned in previous chapters to solve these problems.

- Clearly draw or diagram the information given
- Clearly show each step of the math necessary to arrive at your solution
- Submit scans/pictures of your homework before and after lecture if you are zooming

### Homework Grading Rubric (10 points/problem) Exams (varies)

0	0	Copied the problem onto paper
5	10-30%	Copied the problem correctly on to paper, then made an honest attempt that was a train wreck of math and formula errors.
6-7	30-60%	Made errors in application of 1 or more formulas
8-9	60-90%	Made simple math error but used all formulas correctly
10	100%	Arrived at a correct answer using all formulas correctly with no math errors

**Homework:** Homework will be assigned at every class session. It will be due at the next class session. We will work through the solution at the beginning of the next class session. If you have not at least attempted the homework, you will not be able to participate effectively, and you will be wasting your time and everyone else's. **DO NOT FALL BEHIND!** If you are sick, turn in your homework before lecture via email if possible. You are responsible for watching the Zoom recording of the class to get the assignment/s for the next session/s and completing that. Because I will be solving the problems in class, late homework will not be accepted under other circumstances. **Use a pen or pencil to correct your homework that is a different color than the one you used to do your homework.** You will need a **calculator** that can solve powers, roots, and trigonometric functions.

**Weekly Schedule:** (subject to change)

Week 1: Intro to Class, Basic concepts, Safety

Reading due; Preface, Chapters 1 & 13 (MDS)

Week 2: Acceleration, More Safety

Reading due: Chapter 2 (MDS) Chapter 10 (SAH)

Week 3: More Acceleration, Stage Machinery

Reading due: Chapters 3 (MDS) Chapters 1-3 (SAH)

Week 4: Friction, More Machinery

Reading due: Chapters 4 & 29-33 (MDS)

Week 5: Lifting, Motors and Actuators

Reading due: Chapter 5,14 &15 (MDS)

Week 6: Power, Force, Motors and Power Transmission

Reading due: Chapter 6 (MDS) Chapter 4 (SAH)

Week 7: More Power transmission

Reading due: Chapters 16-20 (MDS)

Week 8: Rotational Motion, and More Power

Reading due: Chapters 7 & 21 (MDS) Chapter 5 (SAH)

Week 9: Accelerational Torque, Feedback and Sensing

Reading due: Chapter 8 & 22 (MDS) Chapter 6 (SAH)

Week 10: Frictional Torque, Control

Reading due: Chapter 9 (MDS) Chapters 7-9 (SAH)

Week 11: Lifting Torque, Operation and Integration  
Reading due: Chapters 10 (MDS) Chapters 11-13 (SAH)

Week 12: Power and Torque, Implementation  
Reading due: Chapters 11 & 23-28 (MDS)

Week 13: Combining multiple motions, Implementation  
Reading due: Chapters 12 (MDS) Chapter 14 (SAH)

Week 14: Safety Revisited  
Reading due: Chapters 13 (MDS) Chapter 10 (SAH)

Week 15: Putting it all together, system design

**Final Examination Date: 5/14/2025 due at 10 am**

#### **SDA PRODUCTIONS, ISPS, AND EXTRACURRICULAR ACTIVITIES**

SDA productions, ISPs and Extracurricular Activities\* will not excuse you from any class work. There will be no exceptions made for absences in class, missed or delayed assignments, homework or lack of class participation resulting from your involvement in any of the above. Your grade will reflect your work in this class, independent from work in any other class or activity.

\*Activities that have been officially sanctioned by the larger university (such as marching band, song girls, or varsity sports) are exempt. You must submit official documentation to your professor regarding your participation in an event prior to your absence.

#### **Academic Integrity**

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the [USC Student Handbook](#). All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

Academic dishonesty has a far-reaching impact and is considered a serious offense against the university. Violations will result in a grade penalty, such as a failing grade on the assignment or in the course, and disciplinary action from the university itself, such as suspension or even expulsion.

For more information about academic integrity see the [student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment or what information requires citation and/or attribution.

#### Course Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relation to the class, whether obtained in class, via email, on the internet, or via any other media. Distributing course material without the instructor's permission will be presumed to be an intentional act to facilitate or enable academic dishonesty and is strictly prohibited. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

#### Equity, Diversity & Inclusion + Intimacy in Theatre Consent Culture Statement

Through our pluralistic approach of diverse pedagogies, methodologies, ideologies, and modalities of artistic expression, we invite(engage) and challenge students to expand their breadth and depth of knowledge, complexity, and range of the human experience. Even though we nurture, guide, and challenge our students to embrace the unknown or unfamiliar and step outside of their comfort zones through storytelling/art, we aim to practice effective strategies and offer tools to students mindful of their physical, psychological, social, and emotional wellbeing. In alignment with professional and industry standards, we will integrate core principles and techniques of Intimacy in Theater and Building Cultures of Affirmative Consent. This will provide agency, offer resources and support to the teachers, students, directors, and staff to establish healthy boundaries of consent when working on material that is physically, intimately, or emotionally charged content in both the classroom and production.

#### SDA Student Support & Reporting Form

To facilitate a supportive environment of accountability, SDA has created an internal system of reporting for students to address issues/concerns and to offer feedback or suggestions for improvement. This mechanism provides a pathway for reporting and offering feedback without fear of retaliation or judgment. Any submission filed through this form will be reviewed and processed accordingly through SDA Office of Equity, Diversity, and Inclusion.

To file a report, please visit: <https://bit.ly/SDAstudentreporting>

## Statement on University Academic and Support Systems

### Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. [The Office of Student Accessibility Services](#) (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at [osas.usc.edu](https://osas.usc.edu). You may contact OSAS at (213) 740-0776 or via email at [osasfrontdesk@usc.edu](mailto:osasfrontdesk@usc.edu).

### Student Financial Aid and Satisfactory Academic Progress:

To be eligible for certain kinds of financial aid, students are required to maintain Satisfactory Academic Progress (SAP) toward their degree objectives. Visit the [Financial Aid Office webpage](#) for [undergraduate-](#) and [graduate-level](#) SAP eligibility requirements and the appeals process.

### Support Systems:

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline consists of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-2500

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

**[Diversity, Equity and Inclusion](#)** - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

**[USC Emergency](#)** - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

**[USC Department of Public Safety](#)** - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

Non-emergency assistance or information.

**[Office of the Ombuds](#)** - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

**[Occupational Therapy Faculty Practice](#)** - (323) 442-2850 or [otfp@med.usc.edu](mailto:otfp@med.usc.edu)

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

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