

USC School of Dramatic Arts

Theatre 438 Technical Direction
20171—MW—8:00 am-9:50 am
Location: TBD

Instructor: Duncan Mahoney

Office: TTL 102

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

Contact Info: dmahoney@usc.edu 213-743-1968

Course Description and Overview

To instruct students in advanced technical direction topics including basic engineering techniques for analysis of common structural elements used in scenery and rigging.

Learning Objectives

Through lecture, example, and much hands-on practice, students will learn mathematical techniques to analyze the forces acting on simple stage rigging systems and structural scenic elements, and then select materials appropriate for the stress levels to use in those systems and elements. Emphasis will also be placed on appropriate documentation and shop drawings for structural systems.

Prerequisite(s): Thtr 230

Recommended Preparation: Thtr 335

Required Texts: Structural design for the Stage 2nd ed., Alys Holden, Bronislaw Sammler; Stage Rigging Handbook, 3rd ed., Jay O. Glerum.

Recommended texts: The Backstage Handbook, Paul Carter; Scenery for the Theatre, Burris-Meyer, & Cole.

Grading: 50% homework assignments, 20% midterm, 30% final exam.

Homework: Homework will be assigned at every class session. It will be due at the next class session. Write down all the steps in your solution, partial credit will be given for correct procedure in spite of simple math errors. 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 at the next class session you are able to attend, but you are also responsible for contacting a classmate or the instructor to get the assignment/s for the next session/s and completing that as well. Because I will be solving the problems in class, late homework will not be accepted under other circumstances. **Bring a pen or pencil to class that is a different color than the one you used to do your homework.**

Note: This class will involve a LOT of math. You may wish to do a brief review of algebra and trig. You will need a **calculator** that can solve powers, roots, and trigonometric functions. **Bring it to class with you.**

Weekly Schedule: (subject to change)

Week 1: Intro to class, rigging math

Reading: Stage Rigging Handbook, Chapters 1 & 2

Handout: oblique triangle formulas

Week 2: Rigging math

Reading: Stage Rigging Handbook, all of it, then re-read Chapters 1 & 2
Structural Design, Appendix A

Week 3: Forces, stresses, and strains.

Reading: Structural Design, Chapters 1 & 2

Week 4: Forces, stresses, and strains.

Week 5: Stress Analysis for Beams

Reading: Structural Design, Chapter 3

Week 6: Stress Analysis for Beams

Week 7: Geometric Properties

Reading: Structural Design, Chapter 4

Handout: Midterm exam

Week 8: Geometric Properties

Week 9: Geometric Properties & Sawn Lumber Beam Design

Reading: Structural Design, Chapter 5

Week 10: Sawn Lumber Beam Design

Week 11: Sawn Lumber Beam Design & Steel Beam Design

Reading: Structural Design, Chapter 8

Week 12: Steel Beam Design

Week 13: Wood Column Analysis and Design

Reading: Structural Design, Chapter 6

Week 14: Steel Column Analysis and Design.

Reading: Structural Design, Chapter 9

Week 15: Combined loading, plywood, or truss TBD

Final Examination Date: Mon., 5/8/2017 11:00 am-1:00 pm

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, Behavior Violating University Standards <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu/> or to the *Department of Public Safety* <http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other resources.

Support Systems

A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students.

The Office of Disability Services and Programs http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu/> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.