

Mechanization & Automation for Theatre

THEA 22222 Fall 2018

Michael O'Nele

Office: TC 123

Phone: 678-2564

About the Class:

Stage Mechanics is meant to introduce students to basic types of mechanisms, controllers and sensors used to create mechanized and automated scenery.

Teaching Philosophy:

Nearly all of this class will consist of hands on work. You will be designing mechanisms, programming and running equipment. The class may also involve fabrication and other shop work.

Student Expectations:

Attendance is required. If anyone needs help or has questions, at any time, please find me and ask. I am usually in my office or the shop if I am not in class. Three unexcused absences will result in the loss of one full letter grade for the class. Be on time! Four late entries will qualify as 1 absence. If you are sick, call me and leave a message before you skip class! Otherwise I will consider you without excuse!! I expect you to participate in class discussions, as well as in class demos and projects. Please dress appropriately.

Please understand that plagiarism in any form constitutes *academic misconduct* (as defined and discussed in the Student Handbook) and is grounds for *Summary Discipline*. Any attempt to appropriate or submit the work of another person as though it were your own constitutes plagiarism.

Disabilities

In an effort to comply with the American Disabilities Act (ADA), I strongly encourage any student with a disability condition which requires accommodation, or which may affect performance in this course, to bring this to my attention as soon as possible, either in class or in the privacy of my office. I will make a sincere effort to provide reasonable accommodation to your needs.

Texts:

<i>Basic Machines and their uses (Navy) (\$9)</i>	required
<i>Small motor, gear and ... Handbook</i>	required
<i>500 basic machanisms (\$13)</i>	recommended
<i>Machine Design (Hendrix)</i>	recommended

Grade Break Down:

Projects	75%
Written Work (Planning & Design)	25%

Grade Scale:

95-100	A+	90-95	A		
85-89	A-	83-85	B+	80-83	B
75-79	B-	73-75	C+	70-73	C
65-69	C-	63-65	D+	60-63	D
55-59	D-	0-55	F		

Schedule:

Week 1.

Greetings, Class Info, Book Info.
Levers, Wheel & Axle systems, Basic Theatre Machines

Week 2.

Electrics for control systems
Switches, relays, power formulas, electrical safety

Project: Demo Board

Week 3.

Solenoids and electric actuators

Project: Theatre “trick” or latch system (curtain drop, plate crash, sign fall...)

Week 4.

Fluid Power (compressed air, open loop)

Work, power, force & pressure

Project: Movement (rotational movement from linear actuator, compound movement, positioning)

Week 5.

Fluid Power (Hydraulic systems, closed loop)

Project: Movement (and control of closed loop system)

Week 6.

Gear reducers, pulley systems

Power transmission components

Week 7.

Mechanical & Fractional advantage

Project: Implement manual winch drive (apply different gearing strategies)

Week 8.

Motor Fundamentals: AC Motors, DC Motors, Motor Construction

Project: DC motor for small effects (Drill motor)

Week 9.

Motor Controls, Motor feedback & Braking

Week 10 .

Introduction to Control systems: Arduino

Project: Sensor & Relay Control with the Arduino

Week 11.

Programable Logic Controllers, Ladder logic programming

Set up demo equipment

Week 12.

Begin programming

Project: Basic circuit control with PLC

Week 13.

Programing

Thanksgiving Break

Week 14.

Connors System install (all 3 units)

Week 15.

Final Presentations Connors Cueing

