New York City College of Technology, CUNY
Entertainment Technology Dept.
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ENT 3400 - Stage Rigging and Mechanics
2 cl hrs, 2 lab hrs, 3 cr
Pre-requisites: ENT 3320 Technical Production

Course Description:

The course familiarizes the student with the basic principles of stage and event rigging, the equipment in general use and the appropriate safety practices and procedures used in the industry

By the end of the course the student should be able to:

- Estimate weights of objects and determine loads imposed on the rigging system
- Identify and properly connect essential rigging hardware
- Tie a selection of important knots
- Operate a counterweight rigging system
- Rig a theatrical aluminum truss on chain hoists
- Specify complete lists of materials required for basic rigging situations

Required Texts:

Stage Rigging Handbook, third edition, by Jay O. Glerum, 7
Backstage Handbook by Paul Carter, 3rd Edition. Broadway Press. ISBN: 978-0911747393
Recommended Reading:
Wire Rope Users Manual, Wire Rope Technical Board, 1993
Entertainment Rigging, Harry M. Donovan, 2002

Required Equipment:

A scientific calculator with pi, root, square, and trig functions; 25' tape measure, pen or pencil, tie line.
NOTE: You are required to bring your equipment to every class meeting!

Grades:

Your grade will be determined as follows:

Lab Participation	10%
Homework	35%
Quizzes	5%
Mid-Term Exam	20%
Final Exam	20%
System Design Project	10%

NOTE: If you miss a quiz or test due to an unexcused absence, you will receive a zero for that test or quiz. Quizzes are typically given to ensure that you do the reading, and may contain questions not covered in class. Do the reading!

The rating of lab participation is completely at the instructor's discretion, and includes evaluation of attention, effort, improvement, contribution to discussions, and willingness to practice hands-on skills.

The midterm and final exams are administered as open-book tests. The textbook, handouts, notes, and completed homework assignments are allowed for the student's reference.

Homework will be assigned for every lecture, and will be due the following week. Keep up with the homework, as you will be able to use your corrected assignments as reference during the mid-term and final.

Learning Outcomes

After taking this class, the student will be able to...	**This will be demonstrated by...**
• Estimate weights of objects and determine loads imposed on the rigging system	Homework, exams
• Identify and properly connect essential rigging hardware	Homework, exams, lab work
• Tie a selection of important knots	Homework, exams, lab work
• Operate a counterweight rigging system	Homework, exams, lab work
• Rig a theatrical aluminum truss on chain hoists	lab work
• Specify complete lists of materials required for basic rigging situations	Homework, exams, lab work

Gen Ed Learning Outcomes

After taking this class, the student will be able to...	This will be demonstrated by...
Use quantitative and qualitative analysis to describe and solve problems	Homework, exams, lab work
Demonstrate Intellectual honesty and personal responsibility.	Homework, lab work

Weekly Schedule			
Date	**Day**	**Topic**	**Homework Due**
W/1		**Lecture:** Intro, Math Review, Forces, Equilibrium, Free Body Diagram **Lab:** Simple Beam with point load	
W/2		**Lecture:** Stress/Strain, Bridles, Resultants, Allowable Loads **Lab:** Bridle installation and analysis	Homework 1 Read *SRH* pp 1-41
W/3		**Lecture:** Mechanical Advantage, Block and Tackle **Lab:** Block and Fall practice	Homework 2 Read *SRH* pp 42-64
W/4		**Lecture:** Hemp Rigging **Lab:** Spotline Rigging Setup	Homework 3 Read *SRH* pp 65-111
W/5		**Lecture:** Counterweight Rigging **Lab:** Counterweight Operation	Homework 4 Read *SRH* pp 112-165
W/6		**Lecture:** Motorized Rigging and Chain Hoists **Lab:** Hoist safety and operation	Homework 5 Read *SRH* pp 166-188 Read Chain Hoist Handout
W/7		Mid-Term	
W/8		**Lecture:** Problem Solving and Cable Terminations **Lab:** Swage and Cable Clip application	Homework 6 Read *SRH* pp 189-228
W/9		**Lecture:** Truss Rigging, Spanset Technique **Lab:** Truss Assembly	Read Truss Handout
	No Class – Spring Recess		
	No Class – Spring Recess		
W/10		**Lecture:** Hardware Specification **Lab:** Hardware Assembly and Installation	Homework 7 Read Hardware Handout
W/11		**Lecture:** Tracking and Traveling Rigs **Lab:** Traveler Curtain Installation	Homework 8
W/12		**Lecture:** Weight Estimation, Center of Gravity Calculation **Lab:** Center of Gravity; hoisting irregular objects	Homework 9
W/13		**Lecture:** System Design Principles and Process **Lab:** Work on System Design Project	Homework 10
W/14		**Lecture:** Final Review **Lab:** Knots, hardware, assembly – skills review	System Design Project
W/15		Final Exam	
Note: Schedule is always subject to change			