Glendale College

Course Outline of Record Report

Course ID 010751

Created - February 2025

THTR132 : Lighting Power Distribution and Networking

General Information

Author:	• Melody Gunter
Course Code (CB01) :	THTR132
Course Title (CB02) :	Lighting Power Distribution and Networking
Department:	T ART
Proposal Start:	Spring 2026
TOP Code (CB03) :	(1006.00) Technical Theater*
CIP Code:	(50.0502) Technical Theatre/Theatre Design and Technology.
SAM Code (CB09) :	Clearly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000653139
Curriculum Committee Approval Date:	02/26/2025
Board of Trustees Approval Date:	04/22/2025
Last Cyclical Review Date:	02/26/2025
Course Description and Course Note:	THTR 132 is the study of power distribution and networking of lighting used in the live entertainment industry. Students receive an in-depth analysis of the common practices within entertainment lighting of the distribution of power and data networking systems used in live events, such as concerts and theatrical performances.
Justification:	New Course
Academic Career:	• Credit
Mode of Delivery:	• In-Person
Author:	• Melody Gunter
Course Family:	Scenic and Lighting, Technical Theatre: Stagecraft/Building

Academic Senate Discipline

Primary Discipline:	• Theater Arts
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

☐ Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

- Grade with Pass / No-Pass Option

Course Support Course Status (CB26)

Course is not a support course

General Education and C-ID

General Education Status (CB25)

Not Applicable

Transferability

Transferable to both UC and CSU

Transferability Status

Pending

Units and Hours

Summary

Minimum Credit Units (CB07)	3
Maximum Credit Units (CB06)	3
Total Course In-Class (Contact) Hours	90
Total Course Out-of-Class Hours	72
Total Student Learning Hours	162

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

☐ Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	2	4
Laboratory Hours	3	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	36

Laboratory	54
Studio	0
Total	90

Course Out-of-Class Hours

Lecture	72
Laboratory	0
Studio	0
Total	72

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Prerequisites, Corequisites, Recommended Corequisites, and Recommended Preparation

No Value

Entry Standards

Entry Standards	Description
No value	No value

Course Limitations

Cross Listed or Equivalent Course	Description
No value	No value

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Laboratory
Methods of Instruction	Discussion
Methods of Instruction	Demonstrations
Methods of Instruction	Collaborative Learning

Out of Class Assignments

- Observation of intelligent and conventional lighting used live
- Participation in or observation of live events on campus using intelligent and conventional lighting

Methods of Evaluation	Rationale
Exam/Quiz/Test	Midterm Exam
Project/Portfolio	Individual projects based on power distribution and data networking
Exam/Quiz/Test	Quizzes based on different types of power distribution and data networking and their applications in live events
Activity (answering journal prompt, group activity)	Practical class work surrounding the hands-on use of power distribution and data networking
Other	Class Participation
Exam/Quiz/Test	Final Exam

Textbook Rationale

This is a classic text. It is the standard text for Automated Lighting. There is no equivalent.

Textbooks

Author	Title	Publisher	Date	ISBN
Cadena, Richard	Automated Lighting: The Art and Science of Moving and Color-Changing Lights	Routledge	2017	9781138850897

Other Instructional Materials (i.e. OER, handouts)

No Value

Learning Outcomes

Course Objectives

Analyze the electricity and electronics of a lighting instrument in order to understand how power should be distributed.

Experiment with a variety of power distribution and data networking systems in order to understand their differences and similarities.

Inspect and assess the power distribution of a single light plot for the designated venue.

Assess the capabilities of digital networking for intelligent light.

Examine the connectivity and control of lighting in order to better understand how power and data should be distributed.

SLOs

Distinguish main elements of data networking in lighting. Expected Outcome Performance: 70.0

Demonstrate safe working habits when dealing with electrical safety and troubleshooting. Expected Outcome Performance: 70.0

Assess the power distribution of a single lighting set up. Expected Outcome Performance: 70.0

Demonstrate an understanding of how intelligent light and conventional light operates during a live production and the need for appropriate power distribution and networking. Expected Outcome Performance: 70.0

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No

Is this proposal submitted in response to learning outcomes assessment data?

No

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Power Distribution Systems—Supply, Distribution Panels, and Portable Power Distribution Units, Circuits, and Dimmers (8 hours)

- Types of electrical power sources
- Distribution panels: structure, components, and operation
- Portable power distribution units: applications and safety considerations
- Circuit design and load balancing
- Dimmers: types and their impact on lighting performance
- Grounding and bonding principles for safety

Data Distribution System—Cables, Splitters, Amplifiers, Gateways, and DMX Connectors (8 hours)

- DMX512 protocol: overview and structure
- Types of data cables
- Splitters and amplifiers
- DMX gateways and network integration
- Proper use and troubleshooting of DMX connectors
- Managing signal latency and interference

Electricity and Electronics—Current, Voltage, Resistance, Power, and Energy (2 hours)

- Ohm's Law and its application in lighting systems
- AC vs. DC power: behavior and impact on lighting equipment
- Power calculations: watts, amps, and voltage relationships
- Energy efficiency considerations in lighting setups

Electrical Planning and Preparation (2 hours)

- Load calculations and capacity planning
- Selecting appropriate circuit breakers and distribution methods
- Pre-show electrical system checks and best practices
- Emergency power planning and backup solutions

Overcurrent, Over-Voltage, and Over-Temperature Protection (2 hours)

- Circuit breakers, fuses, and their applications
- Surge protection devices (SPDs) and transient voltage suppression
- Thermal management: cooling systems and heat dissipation in fixtures
- Fire hazards and safety compliance in stage lighting

Digital Electronics and Data Transmission (4 hours)

- Analog vs. digital signals in lighting control
- Signal encoding and decoding in DMX and Ethernet networks
- Latency, bandwidth, and data compression in lighting networks
- Noise reduction and interference mitigation techniques

Building a DMX Data Network (4 hours)

- Planning a scalable DMX network layout
- Network redundancy and failover strategies

Remote Device Management (RDM)—Physical Layer and Discovery (2 hours)

- RDM protocol overview and implementation
- Common troubleshooting techniques for RDM communication

Ethernet-Based Lighting Control (2 hours)

- Introduction to Art-Net, sACN, and other Ethernet-based protocols
- Network hardware: routers, switches, and network configuration
- Advantages of Ethernet-based lighting control vs. DMX
- IP addressing and subnetting basics for lighting networks

Maintenance, Troubleshooting, and Repair (2 hours)

- Common electrical and networking issues in lighting systems
- Best practices for diagnosing and resolving connection problems
- Routine maintenance for dimmers, fixtures, and control equipment
- Proper handling and storage of cables and connectors

Total Hours: 36

Laboratory/Studio Content

Power distribution systems—supply, distribution panels and portable power distribution units, circuits, and dimmers (7 hours)

- Types of electrical power sources
- Distribution panels: structure, components, and operation
- Portable power distribution units: applications and safety considerations
- Circuit design and load balancing
- Dimmers: types and their impact on lighting performance
- Grounding and bonding principles for safety

Data distribution system—cables, splitters, amplifiers, gateways, and DMX connectors (7 hours)

- DMX512 protocol: overview and structure
- Types of data cables
- Splitters and amplifiers
- DMX gateways and network integration
- Proper use and troubleshooting of DMX connectors
- Managing signal latency and interference

Electricity and electronics—current, voltage, resistance, power, and energy (3 hours)

- Ohm's Law and its application in lighting systems
- AC vs. DC power: behavior and impact on lighting equipment
- Power calculations: watts, amps, and voltage relationships
- Energy efficiency considerations in lighting setups

Laying out the lighting system (8 hours)

- Reading and Interpreting Lighting Plots
- Determining Power Requirements
- Mapping DMX and Network Topologies
- Fixture Placement and Positioning
- Routing Power and Data Cables
- Patch Assignments and Addressing
- System Testing and Optimization
- Adapting to Venue-Specific Constraints

Overcurrent, over-voltage, and over-temperature protection (3 hours)

- Circuit breakers, fuses, and their applications
- Surge protection devices (SPDs) and transient voltage suppression
- Thermal management: cooling systems and heat dissipation in fixtures
- Fire hazards and safety compliance in stage lighting

Digital electronics and Data transmission (6 hours)

- Analog vs. digital signals in lighting control
- Signal encoding and decoding in DMX and Ethernet networks
- Latency, bandwidth, and data compression in lighting networks
- Noise reduction and interference mitigation techniques

Building a DMX data network (6 hours)

- Planning a scalable DMX network layout
- Network redundancy and failover strategies

Remote Device Management (RDM)—physical layer and discovery (3 hours)

- RDM protocol overview and implementation
- Common troubleshooting techniques for RDM communication

Ethernet-based lighting control (1.5 hours)

- Introduction to Art-Net, sACN, and other Ethernet-based protocols
- Network hardware: routers, switches, and network configuration
- Advantages of Ethernet-based lighting control vs. DMX
- IP addressing and subnetting basics for lighting networks

Maintenance, troubleshooting, and repair (4.5 hours)

- Common electrical and networking issues in lighting systems
- Best practices for diagnosing and resolving connection problems
- Routine maintenance for dimmers, fixtures, and control equipment

- Proper handling and storage of cables and connectors

Lighting Power Distribution and Networking Crew Work (5 hours)
- Understanding the roles within the power and networking crew
- Crew Communication and Coordination
- Safety Protocols and Procedures
- Efficient Cable Management
- Load-In and Strike Procedures
- Documentation and Labeling

Total Hours: 54

Additional Information

Repeatability

Not Repeatable

Justification (if repeatable was chosen above)

No Value

Is it possible this course will have a material fee?

No Value

I have contacted my library liaison (https://campusguides.glendale.edu/faculty/liaisons):

No Value

What term(s) will this course be offered?

No Value

Will any additional resources be needed for this course? (Click all that apply)

No Value

If additional resources are needed, add a brief description and cost in the box provided.

No Value

Resources

Did you contact your departmental library liaison?

Yes

If yes, who is your departmental library liason?

Adina Lerner (Technology & Aviation, Visual & Performing Arts)

Did you contact the DEIA liaison?

No

Were there any DEIA changes made to this outline?

No

If yes, in what areas were these changes made:

No Value

Will any additional resources be needed for this course? (Click all that apply)

- New Equipment

If additional resources are needed, add a brief description and cost in the box provided.

The Entertainment Technology Academy is currently acquiring equipment to support this and other new courses.