ELPT 2301 JOURNEYMAN REVIEW (Fall 2015)

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ELPT 2301 JOURNEYMAN'S EXAM REVIEW- INTERMEDIATE

Course Description: Preparation for journeyman electrician licensure with emphasis on calculations and the National Electrical Code (NEC).

End-of-Course Outcomes: Recognize and properly utilize formulas used to solve problems for direct current and alternating current application including single-phase and three-phase; describe proper materials and wiring methods used for wiring; explain license requirements of various jurisdictions and the procedures for applying and testing for licensure; and identify important test-taking skills.

COURSE MATERIAL:

NCCER 2011 Electrical Three Trainee Guide. Pearson 2011

Module 26209-11	Grounding and Bonding`
Module 26301-11	Load Calculations- Branch and Feeder Circuits
Module 26302-11	Conductor Selection and Calculations
Module 26303-11	Practical Applications of Lighting
Module 26305-11	Overcurrent Protection
Module 26401-11	Load Calculations-Feeders and Services

Supplemental: 2014 National Electric Code

WEEKLY SCHEDULE AND ASSIGNED HOMEWORK

Week 1 (8/25) - Introductions and Course Descriptions
Course Objectives and Goals
Lecture on "Conductor Selection and Calculations"

1. Conductor Applications (Branch and Feeder Circuits)
2. Over-current protection in circuits
3. Properties of Conductors (AWG Sizes and Color Codes)
4. Introduction to Voltage Drop
5. Voltage/Amperage

HW: Read "Conductor Selection and Calculations" Pg. 1-19
HW: Review Questions 1-10 Pg. 20.
HW: Supplemental Questions: #8, #13, #14, #15 (Pgs. 21 & 22)

Week 2 (9/1) - Lecture on "Conductor Selection and Calculations" with Classroom participation.

1. Voltage Drop Calculations
2. Resistance Tables and Circular Mils References in the NEC
3. Conversion of Square Mils to Circular Mils
4. Voltage Drop Equations
5. Week 1 Homework Due!

HW: Review for Test 1 on "Conductor Selection and Calculations".

Week 3 (9/8) - **"Conductor Selection and Calculations" TEST 1**.
Lecture on "Practical Applications of Lighting"

1. Discuss foot candles, lumens, and candlepower
2. Types of Lighting Fixtures and various voltages
3. Applications of Lighting and examples
4. Lighting Automation

HW: Read "Practical Applications of Lighting" Pages 1-20
HW: Review Questions 1-10 (Pg. 41)

Week 4 (9/15) - "Practical Applications of Lighting" Lecture and class discussion.

1. Special Purpose Wiring Systems
2. Lighting Control Circuits
3. Review for TEST 2

HW: Review for Test 2 "Practical Applications of Lighting"
HW: Read " Practical Applications of Lighting" Pages 21-40
HW: Review Questions 1-10 (Pg. 41)
HW: Supplemental Questions #6 & #8 (Pg. 42)
HW: Study for TEST 2

Week 5 (9/22) - **"Practical Applications of Lighting" TEST 2** .
Performance Test on "Practical Applications of Lighting".
Week 3 & 4Homework Due!
Lecture on "Over current Protection"

1. Fault Currents
2. Types of Fuses and Breakers
3. Ampere and Interrupting Ratings
4. Fuse Classes
5. Motor Overloads and Short Circuit Protection

HW: "Read Pgs. 1-31 ("Overcurrent Protection")
HW: "Over current Protection" Review Questions: 1-15(Pg. 32)
HW: Supplemental Questions: #5, #6, #14, & #15 (Pgs. 34-35)

Week 6 (9/29) - Lecture on "Over current Protection" with classroom participation.

1. Circuit Breakers
2. Interrupting Capacity Rating
3. Circuit Protection
4. Troubleshooting

Review for TEST 3 "Over current Protection"
HW: Review for Test 3 "Over current Protection"
HW: Complete Week 5 Homework

Week 7 (10/6) - **"Over current Protection" TEST 3.**
Lecture on "Grounding and Bonding".

1. NEC Requirements for Grounding and Bonding
2. Review NEC Section 250
3. Bonding vs. Grounding
4. Effective Ground Paths
5. Service Requirements and Separately Derived Systems
6. Sizing Grounding Electrodes

Week 5 & 6 Homework Due!
HW: Read "Grounding and Bonding" Pg. 1-34
HW: Review Questions Pg. 1-15 (Pgs. 35-36)

Week 8 (10/13) - Lecture on "Grounding and Bonding" with classroom participation.

1. Grounding above 1000volts
2. Testing Electrodes and measuring resistance
3. Practical Code Requirements for Grounding and Bonding
4. Ground Testing

Review for TEST 4
HW: Review for Test 4 (Grounding and Bonding)
HW: Complete Week 7 Homework

Week 9 (10/20)- **"Grounding and Bonding" TEST 4.**
Performance Test on Grounding and Bonding".
Lecture on "Load Calculations-Feeders and Services
1. Introduction to Load Calculations
2. Basic Steps for Load Calculations

Week 7 & 8 Homework Due!
HW: Read Pg. 1-20 ("Load Calculations-Feeders and Services")
HW: Review Questions 1-15 (Pgs. 34-36)

Week 10 (10/27) - "Load Calculations- "Feeders and Services"
Lecture and Class Discussion
1. Calculate Feeder Opacity
2. Applying Demand Factors
3. Applying Voltage Drop
4. General Loads and Square Footage Clarification
5. Lighting Loads
6. Minimum Service Ratings

HW: Read Pg. 21-40("Load Calculations- Feeders and Services").
HW: Review Questions 16-25 (Pgs. 35-36).

Week 11 (11/3) - "Load Calculations-Feeders and Services" Lecture with class participation
1. Sizing Neutral Conductors
2. Multi-Family Calculations
3. Single-Family Calculations
4. Commercial Calculations
5. Calculating for Restaurants, Schools, and Hotels
6. Motors and Motor Circuits

Review for TEST 5 "Load Calculations- Feeders and Services"
Load Calculation Project
HW: Review for Test 5 ("Load calculations- Feeders and Services").
HW: Handout Calculation for Single-Family Residence.

Week 12 (11/10) - **"Load Calculations- Feeders and Services" TEST 5.**
Lecture on "Load Calculations- Branch Feeders and Circuits"
1. Branch Circuit Ratings
2. Derating and Voltage Drop
3. Discuss NEC Requirements and Changes

HW: Read Pgs. 1-10 (Load Calculations: Branch Feeders and Circuits)

Week 13 (11/17) - Load Calculation Project
"Load Calculations- Branch Feeders and Circuits". Lecture and Class Discussion.

1. Lighting Loads
2. Receptacle Loads
3. Signs and Show Window Loads
4. Residential Branch Circuit Loads
5. Sub-Panels

HW: Read Pgs. 11-19 (Load Calculations- Branch Feeders and Circuits)
HW: Review Questions Pg. 20 1-25
HW: Handout on Load Calculations

Week 14 (11/24) - THANKSGIVING BREAK

Week 15 (12/1) - "Load Calculations- Branch Feeders and Circuits" Lecture and class discussion.

1. Small Appliance Loads.
2. Motors, Air Conditioners, and Heaters
3. Kitchens, and Kitchen Equipment
4. Water Heaters, Dryers, Ranges
5. Water Wells

Load Calculation Project
HW: Review for Test 6 (Load Calculations: Branch Feeders and Circuits").

Week 16 (12/8) - Semester Summary. **TEST 6 "Load Calculations-Branch Feeders and Circuits".**

PERFORMANCE TEST

Performance Test 1 — **26209-11 "Grounding and Bonding"**

1. **Connect #4 AWG to Ground Electrode using GAR Clamp.**
2. **Connect same #4 to Ground in Panel Board.**
3. **Install 10' NM cable between two boxes and secure.**
4. **Install a SP Switch and terminate, including ground cable.**
5. **Size minimum size ground for a 200Amp Service, fed with 3/0 Cable.**
6. **Size the grounding conductor for a 400Amp feeder using parallel runs of 3/0 copper.**
7. **Size the minimum required bonding jumper for a water pipe for a separately derived system (Transformer) where the secondary cables are 500KcMil.**

Performance Test 2: **26301-11 " Load Calculations-Branch and Feeder Circuits"**
N/A (Knowledge based Module)

Performance Test 3: **26302-11 "Conductor Selection and Calculations**
N/A (Knowledge based Module)

Performance Test 4: **26303-11 "Practical Applications of Lighting"**

1. **Tour a selected area and identify types of Light Fixtures, and purpose. Identify the Lighting Class of Service.**
2. **Using Manufacturers' catalogs, select the appropriate Light Fixtures for specific lighting requirements**

Performance Test 5: **26305-11 "Overcurrent Protection"**
N/A (Knowledge based Module)

Performance Test 6: **26401-11 "Load Calculations- Feeders and Services"**
N/A (Knowledge based Module)

GRADES

TEST 1 (10 POINTS)	**10**
TEST 2 (10 POINTS)	**10**
TEST 3 (10 POINTS)	**10**
TEST 4 (10 POINTS)	**10**
TEST 5 (10 POINTS)	**10**
TEST 6 (10 POINTS)	**10**
PERFORMANCE TEST 1	**5**
PERFORMANCE TEST 2	**5**
HANDOUT 1	**0**
HANDOUT 2	**0**
Review 1	**5**
Review 2	**5**
Review 3	**5**
Review 4	**5**
Review 5	**5**
Review 6	**5**
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POINTS POSSIBLE:	***100***

100-90 POINTS = A

89-80 POINTS = B

79-70 POINTS =C

69-60 POINTS =D

59 POINTS AND UNDER IS FAILING

BRAZOSPORT COLLEGE GUIDELINES

STUDENTS WITH DISABILITIES

BC is committed to providing equal education opportunities to every student. BC offers services for individuals with special needs and capabilities including counseling, tutoring, equipment, and software to assist students with special needs. Please contact Phil Robertson, Special Populations Counselor at 979-230-3236 for further information.

ACADEMIC HONESTY

Brazosport College assumes that students eligible to perform on the college level are familiar with the ordinary rules governing proper conduct including academic honesty. The principle of academic honesty is that all work presented by you is yours alone. Academic dishonesty including, but not limited to, cheating, plagiarism, and collusion violates both the policies of this course and the Student Code of Conduct. Any occurrence of academic dishonesty will be referred to the Dean of Student Services for prompt adjudication and will at a minimum result in one grade lower in this course.

Please refer to the Brazosport College Student Guide & Calendar for more information.

ATTENDANCE AND WITHDRAWAL POLICY

During each class period we will be learning basic skills/knowledge of the construction industry. If you miss a class, it is your responsibility to schedule any make-up test, homework, or in class assignment with the instructor.

If you fall behind in this class it is your responsibility to withdraw from the class. Because you stop attending class, it does not mean that you have officially withdrawn from class. To officially withdraw and receive a "W" in this class, you need to complete a withdrawal form before the official deadline.

During class, cell phones and pagers are to be turned off or set in "vibrate" mode for the entire class period. Texting is not allowed in this class. If you are expecting a call or text of an emergent nature, please inform me before class to make arrangements in handling the call.

ASSIGNMENTS AND MAKE-UP POLICY

Students are responsible for completing all reading and homework assignments prior to class. There will be a test and a performance lab for each module. In order to receive NCCER credit for the module, you must pass the written test with a minimum score of 70. You have three attempts to achieve a score of 70; however you must waited 48 hours before repeating the test.
Your highest score will be used for the course grade.

COMPUTER USAGE

Computers are to be used for class assignments only. If you are using classroom computers for personal use during class, you will be asked to leave immediately. You will be counted absent and receive a zero for any work assigned during the class period. This includes homework as well as in-class assignments.

Required course materials are available at the Brazosport College bookstore, on campus or online at http://www.brazosport.edu/bookstore. A student of this institution is not under any obligation to purchase a textbook from the college bookstore. The same textbook is/may also be available from an independent retailer, including an online retailer.