



INSTRUCTIONAL PACKAGE

ELW 231
Electrical Power Systems

Effective Term
Fall 2022/Spring 2023/Summer 2023

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Part I: Course Information

Effective Term: Fall 2022/Spring 2023/Summer 2023

COURSE PREFIX: ELW 231

COURSE TITLE: Electrical Power Systems

CONTACT HOURS: 5.0

CREDIT HOURS: 3.0

RATIONALE FOR THE COURSE:

This course covers utility operations and utility network topology.

COURSE DESCRIPTION:

This course examines the basic principles of electrical power systems, including transmission lines, generator and transformer characteristics, fault detection and correction, interpretation of line diagrams and performance of per-unit calculations for circuit performance analysis.

PREREQUISITES/CO-REQUISITES:

COMPASS Reading 65 (Same as for ENG 100) Writing 31 (Same as for ENG 100) Pre-Algebra 40 (Same as for MAT 155) Algebra 26.

SAT Reading 380 Math 400 (MAT 101 placement or use COMPASS Math placement)

ACT Reading 14 English 12 Math 16 (MAT 101 placement or use COMPASS Math placement)

ASSET Reading 37 Writing 37 Pre- Algebra 37

Accuplacer Reading 56 Writing 48 Arithmetic 43 Algebra 50

Companion Reading 56 Writing 48 Arithmetic 43 Algebra 50

***Online/Hybrid** courses require students to complete the [DLi Orientation Video](#) prior to enrolling in an online course.

REQUIRED MATERIALS:

Please visit the [BOOKSTORE](#) online site for most current textbook information.

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

ADDITIONAL REQUIREMENTS:

TECHNICAL REQUIREMENTS:

Access to Desire2Learn (D2L), HGTC's student portal for course materials. myHGTC and college email access.

STUDENT IDENTIFICATION VERIFICATION:

Students enrolled in online courses will be required to participate in a minimum of one (1) proctored assignment and/or one (1) virtual event to support student identification verification. Please refer to your Instructor Information Sheet for information regarding this requirement.

CLASSROOM ETIQUETTE:

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring for an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

NETIQUETTE: is the term commonly used to refer to conventions adopted by Internet users on the web, mailing lists, public forums, and in live chat focused on online communications etiquette. For more information regarding Netiquette expectations for distance learning courses, please visit: [Online Netiquette](#).

Part II: Student Learning Outcomes

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

- Demonstrate the ability to test and identify circuit voltage and phasing (de-energized).
- Effectively describe power delivery from generation to meter.
- Properly identify system protection devices and their purpose.
- Effectively read and diagnose fault detection equipment.
- Employ the use of network maps.
- Demonstrate the ability to resolve alternative feeds from looped conductors.

General Education Outcomes

This course fulfills the following General Education Outcomes through transformer trouble shooting. Upon completion of this course, students will be able to:

- Communicate effectively;
- Think critically;
- Self and professional development.

****Students – please refer to the Instructor’s Course Information sheet for specific information on assessments and due dates.***

Effective Professional and Interpersonal Communication (EPIC)

This course fulfills HGTC’s Quality Enhancement Plan for Effective Professional and Interpersonal Communication. Upon completion of this course, students will be able to:

(Check all that apply.)

- Utilize appropriate communication formats when conveying professional and interpersonal thoughts and ideas.

Apply appropriate language when speaking and writing for their chosen field of study or Industry.

Demonstrate appropriate communication techniques when engaging audiences.

****Students – please refer to the Instructor’s Course Information sheet for specific information on assessments and due dates.***

The following is a specific breakdown of competencies and skills developed in this course.

Unit 1

ESSENTIALS FOR LINEMEN

Safe work practices
Installing personal protective grounding
Identifying and managing risks
Emergency procedures

Unit 2

ELECTRIC UTILITY SYSTEMS

Electrical Energy
Generation
Transmission
Distribution

Unit 3

ELECTRICAL UNITS

Potential
Voltage
Current
Power

Unit 4

ALTERNATING CURRENT

Characteristics of AC
AC Power
AC Transmission

Unit 5

V PHASE AND THREE PHASE CIRCUITS

Delta and Wye Circuits
Three phase power

Unit 6

CONSTRUCTION OF POWER LINES

Pole setting
Material identification and preparation

Installation of equipment
Conductor stringing and sagging

Unit 7

CIRCUIT AND LINE PROTECTION

Substation equipment including breakers
Reclosing devices
Fusing
Current
Power
Surge arresting

Unit 8

TRANSFORMER CONNECTIONS

Single phase
Three phase Delta and Wye
Transformer impedance
Transformer currents
Voltage conversion
Troubleshooting

Unit 9

AERIAL DEVICES AND DIGGER DERRICKS

Fleet inspections
Fleet stabilization
Electrical protection for insulated and non-insulated booms
Aerial device and digger derrick operation

Unit 10

RIGGING

Ropes and knot tying
Sling types and lifting methods
Tensioning and sagging conductors

Unit 11

ENERGIZED WORK PRACTICES

Safety in energized environments
Rubber glove work
Rubber protective equipment
Stick work

Part III: Grading and Assessment

EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS*

Students' performance will be assessed and the weight associated with the various measures/artifacts are listed below.

EVALUATION*

| | |
|-------------|------|
| Tests | 30% |
| Exam | 30% |
| Assignments | 40% |
| | 100% |

****Students, for the specific number and type of evaluations, please refer to the Instructor's Course Information Sheet.***

GRADING SYSTEM:

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the [academic calendar](#) for deadlines for add/drop. You must attend at least one meeting of all of your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of 80 percent (80%) of their classes in order to receive credit for any course. Due to the varied nature of courses taught at the college, some faculty may require up to 90 percent (90%) attendance. Pursuant to 34 Code of Federal Regulations 228.22 - Return to Title IV Funds, once a student has missed over 20% of the course or has missed two (2) consecutive weeks, the faculty is obligated to withdraw the student and a student may not be permitted to reenroll. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

For online and hybrid courses, check your Instructor's Course Information Sheet for any required on-site meeting times. Please note, instructors may require tests to be taken at approved testing sites, and if you use a testing center other than those provided by HGTC, the center may charge a fee for its services.

Part V: Student Resources



THE STUDENT SUCCESS AND TUTORING CENTER (SSTC):

The SSTC offers to all students the following **free** resources:

1. **Academic tutors** for most subject areas, **Writing Center support**, and **college success skills**.
2. Online **tutoring** and academic support resources.
3. Professional and interpersonal communication **coaching** in the EPIC Labs.

Visit the [Student Success & Tutoring Center](#) website for more information. To schedule tutoring, contact the SSTC at sstc@hgtc.edu or self-schedule in the Penji iOS/Android app or at www.penjiapp.com. Email sstc@hgtc.edu or call SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455, or go to the [Online Resource Center](#) to access on-demand resources.



STUDENT INFORMATION CENTER: TECH Central

TECH Central offers to all students the following **free** resources:

1. **Getting around HGTC:** General information and guidance for enrollment, financial aid, registration, and payment plan support!
2. Use the [Online Resource Center \(ORC\)](#) including Office 365 support, password resets, and username information.
3. **In-person workshops, online tutorials and more services** are available in Desire2Learn, Student Portal, Degree Works, and Office 365.
4. **Chat with our staff on TECH Talk**, our live chat service. TECH Talk can be accessed on the student portal and on TECH Central's website, or by texting questions to (843) 375-8552.

Visit the [Tech Central](#) website for more information. Live Chat and Center locations are posted on the website. Or please call (843) 349 – TECH (8324), Option #1.

STUDENT TESTING:

Testing in an **online/hybrid** course may be accomplished in a variety of ways:

- Test administered within D2L
- Test administered in writing on paper
- Test administered through Publisher Platforms

Further more tests may have time limits and/or require a proctor.

Proctoring can be accomplished either face-to-face at an approved site or online through our online

proctoring service. To find out more about proctoring services, please visit the [Online Testing](#) section of the HGTC's Testing Center webpage.

The **Instructor Information Sheet** will have more details on test requirements for your course.

DISABILITY SERVICES:

HGTC is committed to providing an accessible environment for students with disabilities. Inquiries may be directed to HGTC's [Accessibility and Disability Service webpage](#). The Accessibility and Disability staff will review documentation of the student's disability and, in a confidential setting with the student, develop an educational accommodation plan.

Note: It is the student's responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided.

STATEMENT OF EQUAL OPPORTUNITY/NON-DISCRIMINATION STATEMENT:

Horry-Georgetown Technical College prohibits discrimination and harassment, including sexual harassment and abuse, on the basis of race, color, sex, national or ethnic origin, age, religion, disability, marital or family status, veteran status, political ideas, sexual orientation, gender identity, or pregnancy, childbirth, or related medical conditions, including, but not limited to, lactation in educational programs and/or activities.

TITLE IX REQUIREMENTS:

All students (as well as other persons) at Horry-Georgetown Technical College are protected by Title IX—regardless of their sex, sexual orientation, gender identity, part- or full-time status, disability, race, or national origin—in all aspects of educational programs and activities. Any student, or other member of the college community, who believes that he/she is or has been a victim of sexual harassment or sexual violence may file a report with the college's Chief Student Services Officer, campus law enforcement, or with the college's Title IX Coordinator, or designee.

*Faculty and Staff are required to report incidents to the Title IX Coordinators when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

INQUIRIES REGARDING THE NON-DISCRIMINATION/TITLE IX POLICIES:

Student and prospective student inquiries concerning Section 504, Title II, and Title IX and their application to the College or any student decision may be directed to the Vice President for Student Affairs.

Dr. Melissa Batten, VP Student Affairs

Title IX Coordinator

Building 1100, Room 107A, Conway Campus

PO Box 261966, Conway, SC 29528-6066

843-349-5228

Melissa.Batten@hgtc.edu

Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Vice President for Human Resources.

Jacquelyne Snyder, VP Human Resources

EEO and Title IX Coordinator

Building 200, Room 212A, Conway Campus

PO Box 261966, Conway, SC 29528-6066

843-349-5212

Jacquelyne.Snyder@hgtc.edu