



# **INSTRUCTIONAL PACKAGE**

IMT-161

Mechanical Power Applications

Effective Term  
Fall 2023/Spring 2024/Summer 2024

# INSTRUCTIONAL PACKAGE

## Part I: Course Information

Effective Term: Fall 2023/Spring 2024/Summer 2024

COURSE PREFIX: IMT-161

COURSE TITLE: Mechanical Power Applications I

CONTACT HOURS: 8

CREDIT HOURS: 4

### RATIONALE FOR THE COURSE:

This course serves as a foundation course in the mechatronics curriculum. Specifically, student will be introduced to hydraulic and pneumatic circuits, systems, and best practices for safely working with fluid power systems in an industrial environment. This course serves as a prerequisite and/or co-requisite to all level three, four and five Mechatronics courses.

### COURSE DESCRIPTION:

This course covers mechanical transmission devices, including procedures for installation, removal, and maintenance.

### PREREQUISITES/CO-REQUISITES:

( ( ACCUPLACER Reading Comp 056 and ACCUPLACER Sentence Skills 058) or ( New ACCUPLACER Reading Comp 235 and New ACCUPLACER Sentence Skills 235) or ( COMPANION Reading 056 and COMPANION Sentence Skills 058) or ( SAT Critical Reading 380) or ( ACT Reading 14 and ACT English 12) or ( Multiple Measures English 1) or (Credit level [ENG 032](#) Minimum Grade of C\* or Credit level [ENG 100](#) Minimum Grade of C\* or Credit level [ENG 155](#) Minimum Grade of C or Credit level [ENG 155](#) Minimum Grade of TC or Credit level [ENG 101](#) Minimum Grade of C or Credit level [ENG 101](#) Minimum Grade of TC) ) and (Credit level [MAT 032](#) Minimum Grade of C\* or Credit level [MAT 155](#) Minimum Grade of C or Credit level [MAT 155](#) Minimum Grade of TC or Credit level [MAT 101](#) Minimum Grade of C or Credit level [MAT 101](#) Minimum Grade of TC) or ( ACCUPLACER Elementary Algebra 040 or ACCUPLACER Arithmetic 024 or New ACCUPLACER Arithmetic 220 or New ACCUPLACER Adv Algebra 200 or SAT Mathematics 400 or New SAT Mathematics 350 or ACT Math 13 or Multiple Measures Math 1)\***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:

Students are expected to wear work clothing to include non-slip work shoes, and long cotton trousers or jeans. Additionally, students should come prepared with: Headphones/earbuds for multimedia content, scientific calculator, (TI36x Pro or equivalent), USB flash drive. Colored pens or pencils, ¼ ruled graph paper.

## TECHNICAL REQUIREMENTS:

Access to Desire2Learn (D2L), HGTC's learning management system (LMS) used for course materials.  
Access to myHGTC portal for student self-services.  
College email access – this is the college's primary official form of communication.

## 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\*:

1. Students shall exhibit critical reasoning when confronted with technical day-to-day problems and challenges.
2. Students shall know and demonstrate safe working habits and procedures IAW current OSHA standards.
3. Students shall exhibit competence in the following topics:

#### Mechanical Drives 1

- |                                |                             |
|--------------------------------|-----------------------------|
| ⚙ Power transmission safety    | ⚙ Introduction to shafts    |
| ⚙ Machine installation         | ⚙ Introduction to Bearings  |
| ⚙ Motor mounting               | ⚙ Introduction to Couplings |
| ⚙ Speed shaft measurement.     | ⚙ Shaft alignment           |
| ⚙ Key-seat fasteners           |                             |
| ⚙ Key assembly                 | ⚙ Belt drive concepts       |
| ⚙ Torque and power measurement | ⚙ V-Belt operation          |
| ⚙ Mechanical efficiency        | ⚙ Belt Tensioning           |

- ⊗ Belt tensioning measurement
- ⊗ Chain drive concepts
- ⊗ Chain drive operation
- ⊗ Chain tensioning
- ⊗ Chain tension measurement
- ⊗ Fixed center chain installation
- ⊗ Gear drive concepts
- ⊗ Gear drive designs

## **Mechanical Drives 2**

- ⊗ Conventional V-belt drives
- ⊗ Multiple V-belt drives
- ⊗ Wedge V-belt drives
- ⊗ Variable speed V-belt drives
- ⊗ V-belt configurations
- ⊗ V-belt specifications
- ⊗ V-belt component identification
- ⊗ V-belt drive selection
- ⊗ V-belt maintenance and troubleshooting
- ⊗ Timing belt drives
- ⊗ High torque drive belt drives
- ⊗ Synchronous belt drive selection
- ⊗ Synchronous belt maintenance and troubleshooting.
- ⊗ Lubrication concepts
- ⊗ Oils
- ⊗ Greases

## **Laser Shaft Alignment**

- ✶ Laser Shaft Alignment Applications
- ✶ Laser Shaft Alignment System Set-up.
- ✶ Rough Alignment
- ✶ Laser Shaft Alignment Installation
- ✶ Laser Shaft Alignment Operation.
- ✶ Determining Shaft Alignment Tolerances in a Power Transmission System
- ⓘ Installation of Vibration Dampers

- ⊗ Spur gear operation
- ⊗ Spur gear installation
- ⊗ Spur gear analysis
- ⊗ Multiple shaft gear analysis
- ⊗ Multiple shaft drive installation
- ⊗ Sleeve couplings

- ⊗ Lubricant management
- ⊗ Elastomeric couplings
- ⊗ Flange couplings
- ⊗ Rim and face shaft alignment method
- ⊗ Reverse indicator alignment method
- ⊗ Chain couplings
- ⊗ Grid and gear couplings
- ⊗ Coupling selection
- ⊗ Coupling maintenance and troubleshooting
- ⊗ Silent chain drives
- ⊗ Multiple strand systems
- ⊗ Chain selection
- ⊗ Chain lubrication
- ⊗ Chain maintenance and troubleshooting

- ✶ Determining Shaft Alignment Tolerances given Machine Installation

## **Vibration analysis**

- ⓘ Set-up and use of a Vibration Meter
- ⓘ Identify "Natural" Frequency
- ⓘ Effects of Sympathetic Vibration
- ⓘ Installation of Vibration Isolators

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

## **GENERAL EDUCATION OUTCOMES:**

Please delete the section if this course is not part of the Gen Ed PLO assessment artifact process.

This course fulfills the following General Education Outcomes through the (list the appropriate assessment). Upon completion of this course, students will be able to:

(Check all that apply.)

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

### **EFFECTIVE PROFESSIONAL AND INTERPERSONAL COMMUNICATION (EPIC):**

Please delete the section if this course is not part of the EPIC process.

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.

## **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	20%
Assignments	20%
Labs	30%
Shop Practices	5%
Class Participation	5%
Final Exam	20%
	<hr/>
	100%

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

### **GRADING SYSTEM:**

The following grades are used:

A - EXCELLENT: used in GPA calculations; carries a value of 4 quality points and earns credit hours.  
 B - ABOVE AVERAGE: used in GPA calculations; carries a value of 3 quality points and earns credit hours.

C - AVERAGE: used in GPA calculations; carries a value of 2 quality points and earns credit hours.

D - BELOW AVERAGE: used in GPA calculations; carries a value of 1 quality point and earns credit

hours.

F - FAILURE: used in GPA calculations; carries a value of 0 quality points and earns 0 credit hours. (Hours attempted are used in GPA calculations.)

I - INCOMPLETE: does not affect GPA calculations; defaults to "F" automatically after one term if the incomplete work has not been completed and generates 0 quality points and 0 credit hours. (See special note below.)

WF - WITHDRAWN FAILURE: used in GPA calculations; carries a value of 0 quality points and earns 0 credit hours. (Hours attempted are used in GPA calculations.)

W - WITHDRAW: not used in GPA calculations; carries a value of 0 quality points and earns 0 credit hours. May be utilized when extenuating circumstances warrant.

Note: Regarding a grade of "I" (Incomplete): A grade of Incomplete ("I") is assigned when the student does not complete work or take the final exam due to illness or for other reasons over which the student has no control. This grade is given only with the approval of the professor involved. An incomplete must be completed by the end of the following term. Otherwise, the grade becomes an automatic failure ("F").

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.

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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 [ssc@hgtc.edu](mailto:ssc@hgtc.edu) or self-schedule in the Penji iOS/Android app or at [www.penjiapp.com](http://www.penjiapp.com). Email [ssc@hgtc.edu](mailto:ssc@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.



## HGTC LIBRARY:

Each campus location has a library where HGTC students, faculty, and staff may check out materials with their HGTC ID. All three HGTC campus libraries are equipped with computers to support academic research and related school work; printing is available as well. Visit the [Library](#) website for more information or call (843) 349-5268.

## STUDENT TESTING:

Testing in an **online/hybrid** course and in **make-up exam** situations may be accomplished in a variety of ways:

- Test administered within D2L
- Test administered in writing on paper
- Test administered through Publisher Platforms (which may have a fee associated with the usage)

Furthermore, 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, Title VII, 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, Section 504, and Title II Coordinator*

Building 1100, Room 107A, Conway Campus

PO Box 261966, Conway, SC 29528-6066

843-349-5228

[Melissa.Batten@hgtc.edu](mailto: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**

*Affirmative Action/Equal Opportunity Officer and Title IX Coordinator*

Building 200, Room 205B, Conway Campus

PO Box 261966, Conway, SC 29528-6066

843-349-5212

[Jacquelyne.Snyder@hgtc.edu](mailto:Jacquelyne.Snyder@hgtc.edu)