HORRY GEORGETOWN TECHNICAL COLLEGE

INSTRUCTIONAL PACKAGE

TUF 272

Turf Irrigation and Drainage

Effective Term
Fall/2018

INSTRUCTIONAL PACKAGE

Part I: Course Information

Effective Term: Fall 2018

COURSE PREFIX: TUF 272 COURSE TITLE: Turf Irrigation and Drainage

CONTACT HOURS: 7 CREDIT HOURS: 5

RATIONALE FOR THE COURSE:
This course introduces the student to golf course irrigation and drainage systems, their components, operation, and management. It will give them the necessary skills to operate an irrigation system and perform basic troubleshooting and repairs to that system which is one of the most important agronomic tools used by turf managers

COURSE DESCRIPTION:
This course is a study of the principles and practices or irrigation design, installation, and maintenance as it applies to golf courses. Practical application is included.

PREREQUISITES/CO-REQUISITES:
None

REQUIRED MATERIALS: NONE
all material to be provided by the Professor

Please visit the Bookstore online site for most current textbook information. Use the direct link below to find textbooks.

BOOKSTORE.

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

TECHNICAL REQUIREMENTS:
Access to Desire2Learn (D2L), HGTC's student portal for course materials.
WaveNet and D2L email access.

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.

Part II: Student Learning Outcomes

Unit I:

1. List six possible sources of irrigation water for golf courses and some advantages and disadvantages of each source.
2. Identify the different methods of expressing soil and water saline levels and general guidelines for turf growth and development.
3. Calculate the volume of water in ponds and lakes given hypothetical shapes and dimensions.
4. Develop management strategies for dealing with less than desirable water quality levels used for golf course irrigation.

Unit II:

1. List three types of golf course pumping systems and give advantages and disadvantages of each.
2. Explain the difference between end-suction centrifugal, vertical turbine, and flooded suction methods of supplying water to the intake of a golf course pumping system.
3. Describe how a Clayton valve operates and how its opening and closing is controlled.
4. Define the major components of a VFD controlled pumping system such as CPU, pressure transducer, phase inverter, and PLC.

Unit III:

1. Evaluate and select the appropriate sprinkler for a given turf application.
2. Properly space irrigation heads to scale on the green, tee, and fairway of a hypothetical golf hole.
3. Define the terms desired effective coverage, percent head spacing, and wetted diameter.

Unit IV:

1. Perform mathematical computations relating to elevation changes, friction loss in piping, working and static pressures.
2. Properly size pipe and make accurate loop calculations given realistic examples based on GPM flows and expected PSI at sprinkler base of head.
3. Define terms such as SDR, Class Pipe, Pressure Rated Pipe, C Factor, and Velocity as they relate to water movement in irrigation piping.

Unit V:

1. Label the parts of a typical golf course remote control valve.
2. Describe to opening and closing mechanism of an electrical and hydraulic remote control valve.
3. Program the proper information into a computer program for an example three hole golf course.
4. List the various types of golf course irrigation controllers and describe the advantages and disadvantages of each.

Unit VI:

1. Set up a self-leveling level and make necessary adjustments to read it properly.
2. Read a Philly Rod to the nearest 100^{th} of a foot on a consistent basis.
3. Gather field data using a self-leveling level and Philly Rod and plot the information obtained to simulate the installation of a 900-foot tile drain line.

Unit VII:

1. List the components of an automatic irrigation system.
2. Define the terms open, short, partial short, volts, amps, current, and ohms or resistance.
3. Use a volt-ohm meter to troubleshoot a 24-volt electric irrigation circuit.
4. Draw and label the proper method of grounding an irrigation field satellite.

Unit VIII:

1. Compute the precipitation rate (PR) of a specific model and type of sprinkler given the base of head pressure, nozzle size, radius of throw, and layout configuration.
2. Solve problems dealing with sprinkler run times to produce desired depths of precipitation over turf areas.
3. List the variables that affect irrigation scheduling as it relates to daily E.T. values.
4. Define the terms design depth, available moisture content, irrigation interval, and design run time.

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

Module #4
Materials Covered: Pipe Sizing
****Assessment(s):*** Lab activity.

Learning Outcomes:
1. Describe why pipe sizing in needed in irrigation.
2. Calculate pipe size given demand.
3. Calculate psi based on elevation change.
4. Define terms such as SDR, Class Pipe, Pressure Rated Pipe,.
5. List common variants to Mendelian inheritance patterns.
6. Define the roles of cellular reproduction in living cells.

Module # 2
Materials Covered: Pump Systems
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****Assessment(s):*** Complete in lab assignment.
Identification Format.

Learning Outcomes:
1. Identify the difference between end-suction centrifugal, vertical turbine, and flooded suction methods piece of writing.
2. List three types of pumping systems.
3. Describe how a Clayton valve operates.

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

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	50%
Assignments	20%
Lab Projects	10%
Class Participation	10%
Final Exam	10%
	100%

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

GRADING SYSTEM:
State the College's or departmental grading system as delineated in the Catalog. Please note the College adheres to a 10 point grading scale A = 100 – 90, B = 89- 80, C = 79 – 70, D = 69 – 60, F = 59 and below.

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 (ACADEMIC CALENDAR). 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 eighty percent (80%) of his or her classes in order to be eligible to receive credit for any course. However, due to the varied nature of courses taught at the College, a more rigid attendance policy may be required by individual instructors. At a minimum, a student may be withdrawn from a course(s) after he or she has been absent in excess of ten percent (10%) of the total contact hours for a course. **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, if you use a testing center other than those provided by HGTC, the center may charge a fee for its services.

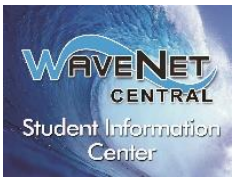
Part V: Student Resources

The Student Success and Tutoring Center (SSTC)

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

1. **Academic coaches** for most subject areas, **Writing Center Support**, and **college success skills.**
2. **On-line student success and academic support resources.**

Visit the SSTC website: Student Success & Tutoring Center and visit the student services tab in your WaveNet account to schedule appointments using TutorTrac. For more information, call: SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455. Room locations and Live Chat is available on the SSTC website.



Student Information Center: WaveNet Central (WNC)

WNC offers to all students the following **free** resources:

1. **Getting around HGTC**: General information and guidance for enrollment!
2. Use the **Online Resource Center (ORC)** for COMPASS support, technology education, and online tools.
3. **Drop-in technology support or scheduled training** in the Center or in class.
4. **In-person workshops, online tutorials and more services** are available.

Visit the WNC website: Wavenet Central. Live Chat and Center locations are posted on the website. Or please call one of the following locations: WNC Conway, 349-5182; WNC Grand Strand, 477-2076; and WNC Georgetown, 520-1473.

10The **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 Jocelyn Williams, Director of Student Development on the Conway Campus Jaime Davis, Counselor/Advisor on the Georgetown Campus or Kristin Griffin, Counselor on the Grand Strand Campus. These individuals 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, gender, national or ethnic origin, age, religion, disability, marital status, veteran status, sexual orientation, gender identity, or pregnancy in educational programs and/or activities.

Title IX Requirements

Horry Georgetown Technical College prohibits the offenses of domestic violence, dating violence, sexual assault, and stalking. Any student who believe he or she has experienced or witnessed discrimination including sexual harassment, domestic violence, dating violence, sexual assault or stalking is encouraged to report such incidents to one of the College's Title IX Coordinators.

> *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 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 Associate Vice President for Student Affairs.	Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Associate Vice President for Human Resources.
Dr. Melissa Batten, AVP 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	**Jacquelyne Snyder, AVP Human Resources** *Section 504, Title II, and Title IX Coordinator* Building 200, Room 212A, Conway Campus PO Box 261966, Conway, SC 29528-6066 843-349-5212 Jacquelyne.Snyder@hgtc.edu