RENG 225 – Tower Climbing and Rescue

2012 Spring Semester
2 Credit (3-hour lecture/laboratory each week)
Pre-requisites: None

INSTRUCTORS:

Dr. Philip V. Hofmeyer, 108 Shannon Hall
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Dr. Benjamin D. Ballard, 108 Shannon Hall
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OFFICE HOURS:

Wednesday and Thurday from 8:30 – 10:00 AM. If necessary, students are also encouraged to make appointments to see the instructor at other times. Students with disabilities who require accommodations to fully-participate in the course activities are requested to contact the instructor within the first two weeks of the semester.

COURSE DESCRIPTION:

RENG 225 is a 2-credit hour class (3 hours of lecture/laboratory each week) designed to give hands-on experience for those entering the residential wind turbine industry. Initial focus is on tower climbing standards, terminology of the tower climbing industry, and competent climber expetations and duties. The course will emphasise working safetly at heights, teamwork in stressful conditions, and fall protection equipment inspection. Students will be held to the National Association of Tower Erectors Authorized Climber and Competent Climber standards. Prospective students should be aware that this course is physically demanding and requires the willingness to be at heights. Must be able to lift 50 pounds and climb a ladder. Spring semester.

EXPECTED COURSE OUTCOMES:

The overall objective of this course is to provide the student with hands-on experience of working at heights on wind turbine towers. Upon completion of this course, the student will be able to:

1. Describe the OSHA regulations governing tower climbing
2. Identify and mitigate environmental hazards to climbers
3. Analyze a tower for structural hazards prior to climbing and while on the tower
4. Inspect personal protective equipment
5. Utilize typical tools for installing and maintaining residential wind turbines
6. Employ ropework and knotwork for ascending and descending
7. Install a descent rope and independent fall arrest system
8. Devise self-rescue techniques
9. Work safetly in a high-stress, team environment

INSTRUCTIONAL METHODS:

1. Lectures
2. Hands-on exercises
3. Laboratory demonstrations
4. Laboratory problem-solving

REQUIRED TEXTS:

No text is required for this course.

REFERENCES:

ComTrain. 2007. Comtrain's Tribute to Safety: Tower Climbing Safety and Rescue, 4th ed. Duane Bennett New Life Press. Monroe, WI. 242 p.

National Association of Tower Erectors. 2008. NATE Tower Climber Fall Protection Training Standard, 2nd ed. 90 p.

STUDENT REQUIRED EQUIPMENT:

Notebook, pencil, steel-shank work boots, leather gloves, sunglasses.

CLASS POLICIES:

Student Behavior: *As students in a technical program are preparing for a professional career, all students are expected to conduct themselves, in both manner and dress, as professionals.*

Eating, drinking, or the consumption of *any* tobacco products is prohibited during class meetings (lecture hall, classroom, laboratory, or field). Doing so may result in the student's dismissal from that class period and will count as an unexcused absence.

Cell phones, pagers, and similar devices must be turned **off** during the instruction time. Use of or disruption of class by these devices **will** result in the confiscation of the device by the instructor, and may result in the student's dismissal from that class period which will count as an unexcused absence. The confiscated device may be retrieved at University Police.

Attendance: Students are required to attend scheduled lectures, labs, and field trips; and to work on class and lab/field assignments as scheduled by the professor. Students are required to attend their scheduled sections for labs, lectures, and examinations (unless authorized by the professor). Since class sessions start on the hour, students are expected to be punctual. *There will be no late entries once a class has begun.* In this case, student's absence will be counted as *unexcused* and will receive a zero for any assignments due.

If a student must leave class early during a regularly scheduled meeting, he/she must discuss reasons with the professor. If a student must miss a scheduled class meeting due to an acceptable, verifiable time conflict, he/she must resolve the time conflict *prior to* class.

If a student is unable to attend class because of an emergency, the professor or School of Agriculture and Natural Resources office must be contacted *prior to* the scheduled class meeting. The telephone number is 684-6515 (Dr. Hofmeyer) or 684-6083 (School office). Use of e-mail (hofmeypv@morrisville.edu) is highly recommended.

Students failing to call ahead or discuss absences prior to the class will be unexcused. **Students with more than 1 unexcused absence in this class will be given the option of dropping the course or receiving a failing grade due to the saftey and skills obtained each week.**

Honesty Policy & Discipline (Due Process): Honesty and integrity are major elements in professional behavior and are expected of each student. Any assignment (including those in electronic media) submitted by a student must be of the student's original authorship.

Representation of another's work as his/her own shall constitute plagiarism. Cheating, in any form, is considered unacceptable behavior within all University courses. Students having academic problems should consult with their advisor or a college counselor. Instances of cheating will be dealt with in accordance to University policy. Standards of academic honesty and due process procedures for Morrisville College are located in the Rules, Regulations & Expectations section of the student handbook.

Safety Guidelines: Certain class assignments may require the student to be absent from the professor's immediate supervision. Whether the student is under immediate supervision or not, safe conduct and safe use of equipment shall be the ultimate rule. **Failure to comply with prudent safety practice and/or willful disregard for class participants and/or equipment may be cause for immediate dismissal from that particular class session by the professor. Subsequent similar activity may be cause for dismissal from the course by the School Dean.**

GRADING/EVALUATION OF THE STUDENT:

Evaluation is a shared responsibility between the teacher and the student. The purpose of the evaluation is to demonstrate how well the professor has taught and the student has learned specific course materials, the principles, concepts and terms relevant to the renewable energy field, and to determine the students' ability to apply that knowledge to specific situations.

Grade Method: Each laboratory session will have a pre-lab assignment to familiarize the student with topics covered during the upcoming class. Each of these assigments will have equal weight and will count for 25% of the student's course grade. Practical examinations (50%) will be scheduled for each student to cover all hands-on knowledge covered during the course. Class participation and safe work habits will be a substantial component of the student's grade. **Any willful action that results in compromised safety of the student or others in the class will result in a loss of participation points for the week. Repeated class participation disruptions will result in dismissal from the course.**

The breakdown of grading is as follows:

Practical Examinations	50%
Homework/laboratory assignments	25%
Class participation	25%
TOTAL	100%

Grading Scale:	100 - 94% = A	89 - 87% = B+	79 - 77% = C+	69 - 65% = D+
	93 - 90% = A-	86 - 83% = B	76 - 73% = C	64 - 60% = D
		82 - 80% = B-	72 - 70% = C-	Below 60% = F

TENTATIVE OUTLINE OF TOPICS*:

Week	Topics (Lecture and Lab)
1	Holiday Break
2	Safety equipment: harness, lanyards, positioning equipment Safety equipment inspection
3	Developing a climbing and evacuation plan Climbing Technique
4	Environmental hazards, mitigation, and climbing comfort Assessing and mitigating ground-level structural hazards Assessing and mitigating structural hazards on tower
5	Tower types, tower components, and structural guidelines Ropework and knotwork, anchors
6	Raising and lowering systems, pulleys, mechanical advantage
7	Mounting Anemometers
8	Hanging climbing pegs and Lad-Safe system
9	Tower J-box, conduit, and disconnect installation
10	Rappelling with Fisk, ID, and Rack
11	Team rescue with Rescue Randy
12	Team rescue (live)
13	Overcoming vertigo (Bergey Tower)
14	Bergey Tower
15	Bergey Tower
Final	Gear Inspection

**The topics and corresponding schedule listed in the table above are tentative and may be subject to change during the semester.*