

Principles of Technology

ETES 5090/7090

Instructor: Dr. Robert Wicklein
542-4503
e-mail: wickone@uga.edu
Web: <http://www.arches.uga.edu/~wickone/>

Office Hours: By Appointment
223 Rivers Crossing Building

Textbook: Physics in Context: An Integrated Approach, CORD
Communications, ©2001, ISBN: 1-57837-275-5

Other Required Materials: Scientific Calculator w/ trigonometric functions

Course Description:

This course will present fundamental principles in a parallel way among the four energy systems – mechanical, fluid, electrical, and thermal. The primary goal of the course is to break the physics barrier by allowing students to explore, experience, understand, and apply physics in real life. Students explore how physics applies to real-life situations while developing the problem-solving skills that are necessary in today's workforce.

Contextual teaching and learning strategies will guide our efforts in this course. Contextual learning strategies have proven to be extremely useful for teachers who want to improve learning for students with multiple intelligences and different learning styles. Curricula and instruction based on contextual learning strategies encourage five essential forms of learning: *Relating, Experiencing, Applying, Cooperating, and Transferring*. Special attention will be given to the development and implementation of a realistic problem solving agenda for the technology education curriculum.

Course Objectives:

Upon completion of this course you should be able to:

1. Identify and define a technological problem
2. Synthesize knowledge and be able to formulate it into a report or use it in solving a defined problem
3. Record and log experimental or design data for use in the documentation of the engineering design process
4. Develop a schedule that will be used in the pursuit of the research and experimentation process to solve identified problems
5. Evaluate the experimentation solutions that have been used in the solution of technological problems
6. Research and develop experimental activities that can be used in a

- technology education classroom
7. Develop a course portfolio that supports and references all aspects of the physics in context process used in technology education and in this course

Detailed Course Requirements:

Laboratory Activities

Laboratory exercises will be assigned on the various topics covered throughout the course. These exercises will usually be based on an experiment from the *Physics in Context – Laboratory Manual*. All activities completed should be well documented and word processed with data recorded in your personal copy of the *Physics in Context – Student Journal (Do Not Write in the Original Student Journals)* so that data is available for required calculations.

Portfolio

Each student will present their completed problems and laboratory assignments at the end of the term in a portfolio of his or her own design. The portfolio, in an 8.5" x 11" format, must be bound in some appropriate manner and should contain a summary of each chapter that we cover during the course as well as the various laboratory assignments that coincide with the chapter. The portfolio will be evaluated on how well it is organized, properly labeled, and attractively displayed.

Examinations

There will be two (2) examinations during the term, a Mid-Term (covering material from the first class meeting to the date of the exam) and a Final (a comprehensive exam related to any/all material covered during the term).

Class Participation

Punctuality and attendance are important to successful completion of requirements for this course. For that reason, attendance will be taken at each class meeting. The class participation portion of the course evaluation will be based on punctual attendance to all class meetings, participation in class discussions, and appropriate care of equipment.

Graduate Students

Each graduate student will select a class date in which they will review the course content and assign a laboratory experiment/class reading. The graduate student will be responsible for leading the class through the experiment and teaching the important points of the chapter.

Evaluation:

Assigned problems, exercises, and laboratory activities.....	40%
Portfolio.....	10%
Mid-Term examination	25%
Final examination (comprehensive exam)	25%
Class participation	5%
Graduate Student	15%

Grading Scale:	A -----	90-100
	B -----	80-89
	C -----	70-79
	D -----	60-69
	F -----	0-59

Laboratory Sessions:

Due dates will be specified for each experiment/activity. Each student/student group is responsible for accomplishing these experiments/activities during open lab times. Make sure you keep up with your laboratory work.

Attendance/Participation:

Attendance is crucial especially considering the density of facts, concepts, principles, and procedures covered in each class. Missing even one class could set you seriously behind. Realize that if you are absent, even for valid reasons, you are responsible for the material and assignments discussed in each and every class. In addition, I expect each participant to take an active role by contributing and sharing thoughts and ideas, taking initiative, and seeking to help other members of the class. Each participant is expected to remain open to new ideas and different points of view.

Attendance records will be recorded at the beginning and at the conclusion of each class meeting. *Your grade in this class will be dropped 3% points for two (2) unexcused absence and you will be removed from the class role after three (3) unexcused absences. In addition, tardiness will result in a 3% point reduction in grade if more than three (3) unexcused tardy attendances occur.*

Late Assignments:

I expect assignments to be completed on time. My standard policy regarding assignments is 10% penalty for late assignments turned in within 1 week of the due date and 50% penalty for assignments turned in thereafter until the end of the course (defined as the last regular class session). I use this system even in the event of "excusables," such as minor sicknesses or other unforeseen conflicts. However, any exceptions to this policy are made at my discretion.

Honesty:

Cheating on class assignments, examinations, or other serious forms of academic activities will result in a grade of an "F" (and a required report to University officials). Persons "borrowing" someone else's work on an assignment will receive a zero on that assignment if it is the first offense. A second offense will be considered a serious form of academic dishonesty. (Borrowee is equally subject to penalties.) Refer to UGA's *A Culture of Honesty: Policies and procedures on academic honesty.*

Withdrawal/Drop Policy:

Drop policy is as described in the university's undergraduate bulletin, page 45.