

The University of Texas at Tyler
College of Business and Technology
Department of Human Resource Development and Technology

Syllabus

Course: **TECH 4350**
Title: **Special Topics-Introduction to Nanotechnology Safety**
Section: 01
Semester: Summer II-2013
Class Time: ONLINE

Instructor: Dominick E. Fazarro, Ph.D.
Office: 242
Other Availability: by email or appointment
Phone: 903.565.5911
Email: dfazarro@uttyler.edu
Preferred Contact: N/A

Goal:

The goal for this course is to provide technology and engineering students the body of knowledge to enable them to understand the nature of safety of nanomaterials which will impact society.

Course Content:

This course Introduces Students to nanotechnology, nanomaterials and manufacturing, national security implications, and societal and ethical issues of nanotechnology

Course Learning Objectives:

Students completing this course should be able to:

- Understand the aspects of nanotechnology through its applications by passing quizzes/exams with a 70% or better.
- Understand the development of nanotechnology through manufacturing by passing quizzes/exams with a 70% or better.
- Understand the national security implications by passing quizzes/exams with a 70% or better.
- Understand the societal and ethical issues of nanotechnology of nanotechnology by passing quizzes/exams with a 70% or better.

Required Textbook:

NO TEXTBOOK REQUIRED

Student Learning Outcomes:

After completing this course, students will be able to understand:

- The ethical and societal impact of nanotechnology,
- Fundamental concepts in sustainable nanotechnology, and
- The nature and development of nanotechnology

Relationship to ABET Outcomes:

ABET Outcomes	TECH 4350
(a) An ability to apply knowledge of mathematics, science, and engineering.	x
(f) An understanding of professional and ethical responsibility.	x
(h) The broad education necessary to understand the impact of engineering solutions in a global economic, environmental, and societal context.	x
(i) A recognition for the need for and an ability to engage in lifelong learning.	x
(j) A knowledge of contemporary issues.	x

This course will meet the College of Business and Technology's (UT-Tyler) student learning outcomes

Course Competencies	TECH 4350
Computer-Based Skills – the student will complete written assignments using the word processor.	X
Communication Skills – the student will exhibit a mastery of both written and oral skills in completion and presentation of the assigned projects.	X
Interpersonal Skills – the student will interact in class discussion to clarify thinking regarding technological progress.	
Problem Solving (Critical Thinking) – the student will use conceptual thinking to analyze and make determinations regarding the use of industrial processing equipment.	X
Ethical Issues in Decision Making and Behavior- the student will gain an appreciation of the ethics of technology through examination of various processing.	X
Personal Accountability for Achievement – the student will complete the projects at the time designated by the instructor and will enter into class discussion.	X
Competence in Technology Principles a. Competence in major field and grounding in other major technology major core areas – the student will gain an appreciation of the benefits and problems of technological growth. b. Exposure to and appreciation for industrial experiences such as industrial tours, work-study options and cooperative education, senior seminars – This competency is not addressed in this course	X

Course Content:

Topics and Subtopics:

- **1A-WHAT IS NANOTECHNOLOGY?**
 - What is nanotechnology and nanoethics?
 - Defining disciplines -Historical perspective (Richard Smalley)
 - ASTM E2456 terminology used in nanotechnology
 - National agenda: US congressional testimony on societal implications nanotechnology
 - Role of National nanotechnology initiatives (NNI)
 - Societal dimensions of nanotechnology
- **2A-ETHICS AND SCIENCE OF TECHNOLOGY**
 - Ethics at intersection of science, business, and governance
 - Science and technology as agents of social change
 - Moral agents: scientist and engineers, business community and corporations, policy makers and regulators

- Nanotech's promise of overcoming humanity's more pressing challenges
- What products are produced?
- **3A-SOCIETAL IMPACTS**
 - Defining ethical and societal implications: interest groups and meanings; spheres of impact and categories of concern; moral dimensions; pace, complexity and uncertainty
 - Technology revolution and problem of prediction
 - Precautionary principle in nanotechnology–Nanotechnology and privacy: instructive case of RFID
 - Nanoscience as catalyst for educational reforms
 - Impact of nanotechnology on developing countries
- **4A-ETHICAL METHODS AND PROCESSES**
 - Language of ethics
 - Research in human subject research
 - Ethical framework for technology assessment
 - Model for ethical analysis
 - Describing the context: scientific and engineering; legal, regulatory, and policy; economic and market; environmental health and safety
 - Framing ethical questions
 - Assessing options for action
 - Finding common ground
- **5A-NANOMATERIALS AND MANUFACTURING**
 - Metal-based, carbon-based, dendrimers, and composites
 - Processes used (e.g. etching & laser ablation)
 - Framing ethical questions: principles of respect for communities, common good, and social justice
 - Assessing options for action
 - Finding common ground
- **6A-ENVIRONMENTAL SUSTAINABILITY**
 - Searching for a sustainable future
 - What are the issues of nanotechnology?
 - Context described: environmentalism and sustainability; environment risks and nanotechnology; potential benefits of nanotechnology for sustainable development
 - Applying life cycle thinking
 - Framing ethical questions
 - Assessing options for action
 - Finding common ground
- **7A-NANOTECHNOLOGY IN HEALTH AND MEDICINE**
 - What are the issues?
 - Context described: pharmaceuticals and therapeutics; diagnostics and imaging; nanoscale surgery; implants and tissue engineering; multifunctional nanodevices and nanomaterials; personalized medicine; broader health care system
 - Framing ethical questions
 - Assessing options for action
 - Finding common ground
- **8A-MILITARY AND NATIONAL SECURITY IMPLICATIONS**
 - Homeland Security
 - New era of Weapons of Mass Destruction (WMD)?
 - Context described: nanotechnology and art of war; nanotechnology and national security
 - Framing ethical questions

- Assessing options for action
- Finding common ground
- **9A-NANOTECHNOLOGY ISSUES IN THE DISTANT FUTURE**
 - Challenges and pitfalls of exponential manufacturing
 - Nanotechnology and life extension
 - Who will control this technology?
 - Global implications

Schedule for Semester:

Date assignment opens on	Module	Topic/Activity* (All modules are PowerPoint Slides)	Due Date Upload on
July 8	-	Student Introductions	-
July 9	1A	WHAT IS NANOTECHNOLOGY?	-
	1A	ASSIGNMENT	JULY 11
	1A	QUIZ/MINI SURVEY	JULY 11
July 13	2A	ETHICS AND SCIENCE OF TECHNOLOGY	-
	2A	DISCUSSION BOARD	JULY 16
	2A	QUIZ/MINI SURVEY	JULY 16
July 15	-	EXPLANATION OF MINI-PROJECT	-
July 17	3A	SOCIETAL IMPACTS	-
	3A	ASSIGNMENT	JULY 19
	3A	QUIZ/MINI SURVEY	JULY 19
July 20	4A	ETHICAL METHODS AND PROCESSES	-
	4A	DISCUSSION BOARD	JULY 22
	4A	QUIZ/MINI SURVEY	JULY 22
July 23	5A	NANOMATERIALS AND MANUFACTURING	-
	5A	ASSIGNMENT	JULY 25
	5A	QUIZ/MINI SURVEY	JULY 25
July 26	6A	ENVIRONMENTAL SUSTAINABILITY	-
	6A	DISCUSSION BOARD	JULY 28
	6A	QUIZ/MINI SURVEY	JULY 28
July 29	7A	NANOTECHNOLOGY IN HEALTH AND MEDICINE	-
	7A	ASSIGNMENT	JULY 31
	7A	QUIZ/MINI SURVEY	JULY 31
Aug 2	8A	MILITARY AND NATIONAL SECURITY IMPLICATIONS	
	8A	DISCUSSION BOARD	AUG 5
	8A	QUIZ/MINI SURVEY	AUG 5
Aug 6	9A	NANOTECHNOLOGY ISSUES IN THE DISTANT FUTURE	
	9A	ASSIGNMENT	AUG 8
	9A	QUIZ/MINI SURVEY	AUG 8
AUG 9	-	UPLOAD MINI-PROJECT	AUG 9

*Guest Speakers will be announced one week before presenting

Point Structure for Assignments

Assignments

➤ Mini-Project	(30%) = 150	points possible
➤ Discussion Board(30pts)	(15%) = 120	points possible
➤ Assignments (20pts)	(10%) = 100	points possible
➤ Quiz (1a)	(5%) = 40	points possible
➤ Quiz (2a)	(5%) = 40	points possible
➤ Quiz (3a)	(5%) = 40	points possible
➤ Quiz (4a)	(5%) = 40	points possible
➤ Quiz (5a)	(5%) = 40	points possible
➤ Quiz (6a)	(5%) = 40	points possible
➤ Quiz (7a)	(5%) = 40	points possible
➤ Quiz (8a)	(5%) = 40	points possible
➤ Quiz (9a)	(5%) = 40	points possible

TOTAL (100%) 730 POINTS

Grading Policy and Criteria to Determine Final Course Grade:

Please refer to the percentage for each letter grade

A	= 100-90%- (730-657)
B	= 89-80%- (656-524)
C	= 79-70%- (523-366)
D	= 69-65%- (365-219)
F	= BELOW 65% (219)

Note: 89.9999999999999999 is still a B.

Course Format

The course involves PowerPoint slides, discussions, case studies, current readings, quizzes, mini-project, and Skype guest speakers. Student responses on the discussion board should have quality content to demonstrate critical-thinking and creativity.

Using Blackboard for Turning in Assignments (PLEASE READ CAREFULLY!!!!)

Blackboard will be the tool for communication and turning in assignments. **ALL ASSIGNMENTS WILL OPEN UP AT 7AM AND TURNED IN PROMPTLY AT 11PM.** Folders will be created for each assignment to upload your assignments. Each assignment will have a due date. **IF YOU DO NOT MEET THE DUE DATE FOR THE ASSIGNMENT, THE FOLDER WILL DEACTIVATE/DISAPPEAR, THEREFORE, YOU WILL NOT BE ABLE TO TURN IN YOUR ASSIGNMENT TO RECEIVE CREDIT.** The only exception to turn in an assignment after the due date is if you are ill (with a written excuse) or technical difficulties. **IT IS YOUR RESPONSIBILITY TO COMMUNICATE WITH TECHNICAL SERVICES TO RESOLVE YOU BLACKBOARD MALFUNCTIONS.**

Blackboard Discussions (Please read carefully!!!!)

The online course format requires communication between students to stimulate conversation and feedback on the topics. In order to receive credit/points for every discussion posted, **you MUST respond to at least two students.**

Grade Dispute

If you have a disagreement with your final grade, you have **1 week to resolve it**. You must bring all of your assignments when meeting with the instructor.

Final Exam Date:

August 9, 2013

Date to Withdraw Without Penalty:

July 15, 2013

Supplies

Flash drive (1G to 4G) to save assignments

Attendance and Make-Up Policy:

Attendance is expected in this course in order to achieve maximum learning for all participants. Unforeseen circumstances do sometimes arise, so periodic absences may occur. If you find that you must miss a class meeting, please contact the instructor *prior* to the start of class. Please be on time. If you must arrive late, let the instructor know prior to the start of class. Laptops are permitted but the wireless internet card must be disabled during the class. Also, cell phones must be turned off and put away during class.

If a student is sick or have a death in the immediate family, the instructor will discuss the arrangements for turning in make-up work. The student must have written proof too make up an assignment or exam.

Writing Assistance

Each student is entitled to free writing assistance in the Writing Center. Students who take advantage of this service will receive five extra points on essay grades if they take their drafts to the Writing Center. The student must provide documentation that he or she received assistance in the Center. **An appointment is strongly advised.**

Communication between Instructor and Student

Please allow 1 to 4 days to respond back to you because I have two other courses to teach. Thank you for your patience.

Department Website: www.uttyler.edu/hrdt

Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <http://www2.uttyler.edu/wellness/rightsresponsibilities.php>

Grade Replacement/Forgiveness and Census Date Policies

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date is the deadline for many forms and enrollment actions that students need to be aware of. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a “W” grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University offers accommodations to students with learning, physical and/or psychiatric disabilities. If you have a disability, including non-visible disabilities such as chronic diseases, learning disabilities, head injury, PTSD or ADHD, or you have a history of modifications or accommodations in a previous educational environment you are encouraged to contact the Student Accessibility and Resources office and schedule an interview with the Accessibility Case Manager/ADA Coordinator, Cynthia Lowery Staples. If you are unsure if the above criteria applies to you, but have questions or concerns please contact the SAR office. For more information or to set up an appointment please visit the SAR office located in the University Center, Room 3150 or call 903.566.7079. You may also send an email to cstaples@uttyler.edu

Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement:

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation:

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services

REFERENCES
(INSERT HERE)

STATEMENT OF AGREEMENT

I (print name) _____ understand the contents of the syllabus and is responsible for all assignments, tests, and any other activities stated and understand all due dates for

assignments, tests, and any other activities in the syllabus for the course TECH 3303 Introduction to Nanotechnology for the Spring semester 2013.

Sign _____

Date _____