

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

**Course Syllabus**

**COURSE:** TECH 3303

**COURSE TITLE :** Principles of Risk Management  
for Nanoscale Materials

**SEMESTER/YEAR:** Spring 2013  
(day and time are not designated yet)

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**Course Description**

This 3-semester credit hour online undergraduate course is the study of assessing the safety of nanoscale materials which can impact health and the environment. As nanomaterials become more prevalent in our consumer products, the potential risk must be evaluated. The course will encompass the use of peer-review article, books, and web sources.

**Delivery of Course**

Online using Blackboard. Students learn best in quite different ways. One of the advantages of the online format of the course is that it allows students to approach the course in ways that suit their personal styles and preferences. In classrooms, instructors are inclined to teach either as they themselves were taught, or as they think "the average student" prefers. Online, all of the instructor-presented class material is laid out at once, and students can do with it whatever they prefer in order to learn in as personal and unique a fashion as possible. **AT THE END OF THE COURSE YOU ARE REQUIRED TO DO AN ONLINE SURVEY.**

**Prerequisite(s)** CHEM 1311, BIO 1306

**Textbook**

Shatkin, J. (2008). Nanotechnology: Health Environmental Risks. CRC Press: Boca Raton: FL  
ISBN: 978-1-4200-5363-0

**Course Objectives**

- ◆ To understand the assessment of nanotechnology health and environmental risks
- ◆ To understand the definition of risk and how it is used to manage environmental protection and risk
- ◆ To understand sustainable nanotechnology products using risk assessment and life-cycle approaches
- ◆ To understand the science of health and toxicology
- ◆ To understand different approaches to life-cycle risk assessment
- ◆ To understand federal government mandates to handle nanomaterial toxicity
- ◆ To understand exposure assessment and characterization of nanomaterials
- ◆ To understand the handling of engineered nanomaterials

- ◆ To be cognizant of potential health concerns of nanoparticles
- ◆ To understand screening of level life cycle risk assessment framework

### **Student Learning Outcomes as per ABET**

At the end of the course, students learning outcomes should be aligned with the Industrial Technology program outcomes:

<b>Program Outcomes</b>	<b>TECH 3303</b>
(a) an ability to apply knowledge of mathematics, science, and engineering	X
(b) an ability to design and conduct experiments, as well as to analyze and interpret data	
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
(d) an ability to function on multidisciplinary teams	X
(e) an ability to identify, formulate, and solve engineering problems	
(f) an understanding of professional and ethical responsibility	
(g) an ability to communicate effectively	
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i) a recognition of the need for, and an ability to engage in life-long learning	X
(j) a knowledge of contemporary issues	
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	

### **Contribution to the Professional Component**

This course develops the students' ability to understand the how to assess nanoscale materials as it relates to health and the environment. In addition to determine if current safety practices are valid for nanoscaled materials.

### **Semester Schedule\***

A daily or weekly schedule is not a required part of or required addendum to a syllabus. It does, however, help keep the course on track throughout a semester, help the instructor from "running out of time" at the end of a course, enable students to always see what is coming up, enable them to see where classes fit into the plan, and evidence good planning and organization. It also saves the instructor significant planning time during the course. It is particularly important for an Internet course, because of the different times students "attend" classes and the logistical problems caused by changing things or improvising "on the fly."

Date	Day	No.	Topic/Activity	Suggested Reading (pgs)/Sources
DATES TO BE DETERMINED BY DEPT.		1	1.1-1.4 Assessing Nanotechnology-Health and environment risk	4-12/TRACS
		2	Assignment-Internet	Due date will be provided
		3	1.5-1.8 Assessing Nanotechnology-Health and environment risk	13-18
		4	Assignment-Internet	Due date will be provided
		5	2.1-2.4 Defining Risk Assessment and How It is Used...	23-31
		6	Assignment-Perception Paper	Due date will be provided
		7	2.5-2.7.4 Defining Risk Assessment and How It is Used...	35-42
		8	Assignment-“Scavenger Hunt”	
		8	3.1-3.2.3 Sustainable Nanotechnology Development Using Risk Assessment and Applying Life Cycle Thinking	50-52
		9	3.3-3.5 Sustainable Nanotechnology Development Using Risk Assessment and Applying Life Cycle Thinking	53-57
		10	**EXAM 1**	Due date will be provided
		11	4.1-4.4 The State of the Science—Human Health, Toxicology, and Nanotechnology Risk	65-73
		12	Assignment-Internet	Due date will be provided
		13	5.1-5.3.2 The State of the Science—Environmental Risk	78-85
		14	Assignment-Internet	Due date will be provided
		15	**GUEST SPEAKER**	
			5.4-5.7 The State of the Science—Environmental Risk	85-93
		16	**EXAM 2**	Due date will be provided
		17	The Creating of Federal Mandates for Handling Nanomaterials	TRACS
		18	**FIELD TRIP**- High Performance Composites Lab, Texas State	
		19	Exposure Assessment and Characterization	TRACS/

				Approaches to Safe Nanotechnology-NIOSH (March , 2009)
		20	Assignment	Due date will be provided
		21	<b>Handling Engineered Nanomaterials</b>	TRACS/ Approaches to Safe Nanotechnology-NIOSH (March , 2009)
		22	Assignment	Due date will be provided
		23	<b>Potential Health Concerns of Nanoparticles</b>	TRACS/ Approaches to Safe Nanotechnology-NIOSH (March , 2009)
		24	<b>**GUEST SPEAKER**</b>	
		25	<b>6.1-6.4 An Adaptive Screening level Life Cycle Risk Assessment Framework for Nanotechnology</b>	99-111
		26	<b>**EXAM 3**</b>	Due date will be provided
		27	<b>FINAL PROJECT (Create Risk Management Program)</b>	Due date will be provided
		28	<b>**FIELD TRIP**- Applied Nanotech, Inc., Austin or, Nanotox, Inc, Austin</b>	
			<b>THANKSGIVING</b>	
		29	PRESENTATION-FINAL PROJECT (Virtual)	

\*Schedule activities may change

### Assessments for Learning

The online course will consist of test (essay), presentations, projects, and book and internet assignments. A rubric will be used to assess your outcomes/work for a grade from each assignment.

### **Field Trips**

There is a requirement to attend two field trips. To fulfill this activity, you must submit a journal entry of your experiences and observations to receive credit.

### **Guest Speakers**

To obtain points for this section, students must participate. Guest speakers will be using Elluminate® to speak to the students.

### **Presentations and Projects**

Students will be able to do presentations and present projects using Elluminate®. This tool allows students do to video conferencing.

### **Getting Into Class**

I have set up a start page for you to go to every time you come to class. It is

<http://www.uttyler.edu/HRDT/.htm>

### **IDEA Statement**

If you have a disability, including a learning disability, for which you request disability support services/accommodation(s), please contact Ida MacDonald in the Disability Support Services office so that the appropriate arrangements may be made. In accordance with federal law, a student requesting disability support services/accommodation(s) must provide appropriate documentation of his/her disability to the Disability Support Services counselor. For more information, call or visit the Student Services Center located in the University Center, Room 282. The telephone number is 566-7079 (TDD 565-5579)." Additional information may also be obtained at the following UT Tyler Web address: <http://www.uttyler.edu/disabilityservices>.

### **University Policies**

The following University policies must appear on each course syllabus or be provided as an informational sheet (web-links to these policies may be used in the print or electronic syllabus) <http://www.uttyler.edu/academicaffairs/syllabuspolicies.pdf>

### **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://www.uttyler.edu/wellness/StudentRightsandResponsibilities.html>

### **Grade Replacement/Forgiveness**

If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12th day of class. Failure to do so will result in both the original and repeated grade being used to calculate your overall grade point average.

Undergraduates will receive grade forgiveness (grade replacement) for only three course repeats; graduates, for two course repeats during his/her career at UT Tyler.

### **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 12th day of class (See Schedule of Classes for the specific date).

Exceptions to the 6-drop rule include, but are not limited to, the following: totally withdrawing from the university; being administratively dropped from a course; dropping a course for a personal emergency; dropping a course for documented change of work schedule; or dropping a course for active duty service with the U.S. armed forces or Texas National Guard.

Petitions for exemptions must be submitted to the Registrar's Office and must be accompanied by documentation of the extenuating circumstance. Please contact the Registrar's Office if you have any questions.

### **Disability Services**

In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Support Services counselor. If you have a disability, including a learning disability, for which you request an accommodation, please contact Ida MacDonald in the Disability Support Services office in UC 282, or call (903) 566-7079.

### **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.

### **Supplemental Resources:**

Texas State University will supply nanotechnology safety articles and web sources for this course.



*Website:*

<https://tracs.txstate.edu/portal/login>

Students will be provided a user name and password to use the articles

### **TO GET TO FOLDER:**

Enter User ID and Password

CLICK ON RESOURCE FOLDER  
 CLICK ON-[Show other sites](#)  
 CLICK ON- [Composites Lab Resources](#)  
 CLICK ON- [Nano-Safety](#) to retrieve articles

**Grading Policy**

This course will use a point system to determine assignments and final grade. If assignments are not emailed promptly at the designated due date, Folders will be created by activity to turn in assignments. Due dates for assignments will be given a week prior. Assignment folders will stay active until the due date expires. Once the assignment folders are deactivated, students cannot open folder to insert work. It is important to keep up with the semester schedule provided. If you have any problems (e.g. medical); you need to provide a doctors note in order to make up the work.

<b><u>Grading</u></b>	<b><u>Percentage</u></b>	<b><u>Point Value</u></b>
Internet Assignments/ Book Assignments	15%	120
Guest Speaker	10%	80
PowerPoint Presentations	15%	120
Innovation Paper	20%	120
Final Presentation & Exams	20%	120
Field Trip	10%	120
Class Participation	10%	120
<b>TOTAL</b>	100%	800