

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

## Syllabus

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Course: TECH 3303  
Title: Introduction to Nanotechnology  
Section: 01  
Summer I 2020  
Class Time: ONLINE

Instructor: Dominick E. Fazarro, Ph.D.  
Office: 242  
Other Availability:  
Phone: N/A  
Email: [dfazarro@uttyler.edu](mailto:dfazarro@uttyler.edu)  
Preferred Contact: N/A

### Course Content:

This course covers the overview of the history, manufacturing, and societal applications of nanomaterials. An emphasis will be placed on the ethics, societal impacts, and the future of nanotechnology.

### Course Learning Objectives:

*Students completing this course should be able to:*

- Understand the basics of nanotechnology by achieving at least 70% on assignments
- Understand the history of nanotechnology by achieving at least 70% on assignments
- Understand how nanotechnology impact society by achieving at least 70% on assignments
- Understand the scaling of nanomaterials is by achieving at least 70% on assignments
- Understand the characterization techniques of nanomaterials is by achieving at least 70% on assignments
- Understand the what nanofabrication is by achieving at least 70% on assignments
- Understand the implications of nanotechnology on biology and medicine is by achieving at least 70% on assignments
- Understand the impact of nanotechnology on microelectronics is by achieving at least 70% on assignments

### Required Textbook NONE

### Course Material for Course

**MODULE 1-Introduction to Nanotechnology**

**MODULE 2-A Brief History of Nanotechnology**

**MODULE 3-A snapshot of Nanotechnology Today**

**MODULE 4-The Uniqueness of the Nano-Scale**

**MODULE 5-How Do We “See” Things at the Nano-scale: An Introduction to Characterization Techniques**

**MODULE 6-How Do You Make Things So Small? An Introduction to Nanofabrication**

## MODULE 9-Nanotechnology, Biology, and Medicine

## MODULE 10-Nanotechnology: Impact on Microelectronics

### Core Competencies

- *Communication skills:* Each student will be able to effectively communicate orally.
- *Interpersonal skills:* Each student will engage in cooperative learning for building working relationship within the groups.
- *Problem-Solving:* Each student will gather and use critical-thinking skills.
- *Change-building skills:* Each student will engage in how to incorporate change when necessary for survivability and become less dependent on being in the “complacent mode”.
- *Student Learning Outcomes*

At the end of the course, students learning outcomes should be achieved in the Industrial Technology program along with assessments used:

Students will be able to appreciate the foundations of nanotechnology. <i>(by earning a grade of 70% or higher on assignments)</i>
Students will be able to appreciate the history of nanotechnology. <i>(by earning a grade of 70% or higher on assignments)</i>
Students will be able to understand how nanotechnology is used in today’s society. <i>(by earning a grade of 70% or higher on assignments)</i>
Students will be able to conceptualize how nano-scaled products are manufactured. <i>(by earning a grade of 70% or higher on assignments)</i>
Students will be able to conceptualize and understand how characterization techniques allow the manufacture of nanomaterials <i>(by earning a grade of 70% or higher on assignments)</i>
Students will be able to understand how nano- medicines is allowing humans to live longer. <i>(by earning a grade of 70% or higher on assignments)</i>
Students will be able to appreciate the impact on microelectronics on today’s technology. <i>(by earning a grade of 70% or higher on assignments)</i>



## Course Format

The course involves PowerPoint slides, discussions, current readings, and YouTube videos. Student responses on the discussion board should have quality content to demonstrate critical-thinking and creativity. For further explanation, see **CANVAS Discussions**.

## Using Canvas for Turning in Assignments

CANVAS 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 attach your assignments. Each assignment will have a due date. **IF YOU DO NOT MEET THE DUE DATE FOR THE ASSIGNMENT, THE FOLDER WILL DEACTIVATE. THEREFORE, YOU WILL NOT BE ABLE TO TURN YOU 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 REPSONSIBILITY TO COMMUNICATE WITH TECHNICAL SERVICES TO RESOLVE YOU CANVAS MALFUNCTIONS.**

## Canvas Discussions

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. **IF YOU RESPOND TO ONE PERSON, YOU WILL RECEIVE ONLY 15 POINTS!**

## Late Assignment Penalty (PLEASE READ CAREFULLY!!!)

You have at least 3-5 days to complete your assignments. I do understand that you have assignments in other courses, but the management is important. **If assignments are uploaded late, there will receive no points!!!** If you do experience computer problems, please contact Computer Support and email me documentation of time and date of the call. That will help me to also contact Computer Support to expedite your request to fix any problems you may have.

## 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:

**July 2-3, 2020**

## Date to Withdraw Without Penalty:

**June 23, 2020**

## Supplies

Flash drive (8G to 16G) to save assignments

## Supplemental Resources:

### *Journal Articles/Books*

Fazarro, D.E., Trybula, W., Tate, J. & Hanks, C. (2017). NANO-SAFETY: What workers need to know to protect workers. De Gruyter, Germany. ISBN: 978-3-11-037375-2

Nano Revolution-Big impact: How emerging nanotechnologies will change the future of education and industry in America (and more specifically in Oklahoma) an abbreviated account.  
The Journal of Technology Studies 35 (1), 9-19.

Allhoff, F., Lin, P. & Weckert, J. (2007). *Nanoethics: The Ethical and Social Implications of Nanotechnology*. John Wiley & Sons, Inc.: New Jersey. ISBN: 978-0-470-08416-8

Hall, S.J. (2005). *Nanofuture: What's Next For Nanotechnology*. Prometheus Books: New York ISBN: 1-59102-287-8

#### *Websites*

**UnderstandingNano.com**-<http://www.understandingnano.com/introduction.html>

**Nanoword.net**-<http://www.nanoword.net/pages/intro.htm>

**Nanowerk**-[http://www.nanowerk.com/nanotechnology/introduction/introduction\\_to\\_nanotechnology\\_1.html](http://www.nanowerk.com/nanotechnology/introduction/introduction_to_nanotechnology_1.html)

**Nanotechnology**-<http://www.zyvex.com/nano/>

**NanotechnologyNow**-<http://www.nanotech-now.com/introduction.htm>

**A Brief Intro to Nanotechnology-Talking Nano Disc 1 Ch. 6: Materials (YouTube Video)**

<http://jetpackfuture.com/Nanotechnology/video:a-brief-intro-to-nanotechnology-talking-nano-disc-1-ch-6-materials/>

**Introduction to Nanotechnology**-<http://www.authorstream.com/Presentation/ankush85-275104-introduction-nanotechnology-big-small-thingdefinition-nanotechnologyfantastic-future-nano-robots-nanot-science-technology-ppt-powerpoint/>

**A Brief Intro to Nanotechnology - Talking Nano Disc 1 Ch. 9/10: A Science in its Infancy –**

<http://www.youtube.com/watch?v=UkfBnzB2nNc>

**Quest**-<http://www.kqed.org/quest/television/view/189?gclid=COrynYPRqaECFUKU7Qod7mSBLw>

**Nanowerk**-[http://www.nanowerk.com/nanotechnology/introduction/introduction\\_to\\_nanotechnology\\_1a.php](http://www.nanowerk.com/nanotechnology/introduction/introduction_to_nanotechnology_1a.php)

#### **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/rightsresponsibilities.php>

#### **UT Tyler Honor Code**

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

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#### **UT Tyler a Tobacco-Free University**

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors.

Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products.

There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit [www.uttyler.edu/tobacco-free](http://www.uttyler.edu/tobacco-free).

#### **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. (For Fall, the Census Date is Sept. 12.) 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 (Sept. 12th) is the deadline for many forms and enrollment actions of which students need to be aware. 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/Accessibility 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 psychological disabilities. If you have a disability, including non-visible a disability diagnosis such as a chronic disease, learning disorder, head injury 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 an Accessibility Case Manager. 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 webpage (<http://www.uttyler.edu/disabilityservices/>) or the SAR office located in the University Center, Room 3150 or call 903.566.7079. You may also send an email to [saroffice@uttyler.edu](mailto:saroffice@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. Revised 09/16

### **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.

## **Student Standards of Academic Conduct**

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. "Cheating" includes, but is not limited to:

- copying from another student's test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructor has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
- falsifying research data, laboratory reports, and/or other academic work offered for credit;
- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

ii. "Plagiarism" includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the submission of it as one's own academic work offered for credit.

iii. "Collusion" includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

iv. All written work that is submitted will be subject to review by SafeAssign™, available on CANVAS.

## **UT Tyler Resources for Students**

- UT Tyler Writing Center (903.565.5995), [writingcenter@uttyler.edu](mailto:writingcenter@uttyler.edu)
- UT Tyler Tutoring Center (903.565.5964), [tutoring@uttyler.edu](mailto:tutoring@uttyler.edu)

