

## **Computer Integrated Manufacturing**

### **Course Syllabus**

Course: TECH 4317	Instructor: Dr. Mark R. Miller
Title: CIM	Office: COB 225.04
Section: .001	Office Hours: M-R 10-11 am
Semester: <b>SPRING 2024</b>	Other Availability: By appointment
Class Time: T 2-4:45	Phone #: 903-566-7186
	Email: mmiller@uttyler.edu

### **Course Description:**

Study of the application of computer-aided-design, computer-aided-manufacturing, computer numerical control, robotics, programmable logic controllers, and computer communication networks to achieve automated manufacturing. **Prerequisite: TECH 2323/ COSC 1307 or advisor consent.**

### **Course Objectives:**

1. Understand the importance and use of solid modeling software.
2. Comprehend the various types of automation and its role in manufacturing.
3. Program CNC machines to make parts.
4. Examine 3D printing.

### **Student Learning Outcomes:**

At the end of this course, students will be able to:

1. Make a detailed drawing of an object using solid modeling 3D CAD software (Autodesk Inventor).
2. Create a 3D print of an object drawn as a solid model.
3. Identify the various types of 3D printers available for certain applications.
4. Write a CNC program that will successfully run on a CNC milling machine.
5. Write a CNC program that will successfully run on a CNC turning center.
6. Design and draw objects using Vcarve software that can be successfully plasma or waterjet cut.
7. Develop an understanding of CAM and automation by successfully passing quizzes and exams with a 70% or better score.

### **Core Competencies**

1. Computer-Based Skills – the student will complete written assignments using the CAM software.
2. Communication Skills – the student will exhibit a mastery of both written and oral skills in completion and presentation of the assigned projects.
3. Interpersonal Skills – the student will interact in class laboratory activities.
4. Problem Solving (Critical Thinking) – the student will use conceptual thinking to analyze and make determinations regarding the use of industrial processing equipment.
5. Ethical Issues in Decision Making and Behavior- the student will gain an appreciation of the ethics of technology through examination of various computer-controlled processing.
6. Personal Accountability for Achievement – the student will complete the projects at the time designated by the instructor and will enter into class discussion.
7. 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 automation.
- b. Exposure to and appreciation for industrial experiences such as industrial tours, work-study options and cooperative education, senior seminars – This competency is addressed through hands-on industrial activities during the lab portion of the course

**Grading Policy and Criteria to Determine Final Course Grade:**

Daily Quizzes	200
Assignments	100
Projects	200
Midterm exam	200
Class Participation/Attendance	100
<u>Final Exam</u>	<u>200</u>

TOTAL POINTS = 1000

NOTE: Points may change depending upon content covered.

**Grade Scale Breakdown:**

A=90 - 100%

B=80 - 89%

C=70 - 79%

D=60 - 69%

F=BELOW 60%

Note: 89.9999999999999999 is still a B.

**Date of Final Exam:** Tuesday, April 30 online

**Date to Withdraw without Penalty:** March 23

**Course Content & Tentative Calendar/Schedule:**

**January**

Administrative concerns, about the course, assignments  
 Introduction to computer integrated manufacturing  
 Manufacturing systems  
 Product design  
 Product engineering  
 Lab activities

**February**

Chapter 5 – Improving Productivity  
 Introduction to production planning  
 Operations planning  
 MRP, MRP II, ERP  
 Lab activities

**March**

**Midterm Exam**

Lean production  
 Chapter 6 – Automated Manufacturing Systems  
 Lab activities

**April**

Production machines and processes  
 Robotics  
 Machine and system control

Lab activities

## April

Chapter 7 – Sensors & Wireless Communication for Automation

Quality and human resources

Review for final

**Final Exam** will be Tuesday, April 30<sup>th</sup> online

### **Attendance and Make-Up Policy:**

Attendance is mandatory and will be taken at every scheduled class and laboratory period. No make-ups unless:

1. Organized university trip.
2. Illness or death in **immediate** family (mother, father, brother and/or sister).
3. Illness of student.

Each one of these will require either a **doctor's statement** or a **signed** statement from the individual in charge of the trip.

**A student will lose a letter grade in the course each time s/he is absent or late 3 times. Any student entering the classroom 1 second after the scheduled starting time will be considered late unless accompanied with a valid excuse.**

### **Late Work:**

All work not turned in on time will have an automatic reduction in value to 50% of its full value. **Work that is not turned in by the next class will NOT be accepted.** Exceptions to this will be as per University Policy concerning absences from class. If you know an assignment will be late for a valid reason, inform your instructor in advance to avoid unnecessary penalty.

### **Required Textbooks, Materials, and Supplies:**

J. Barry Duvall and David R. Hillis (2012). **Manufacturing Processes: Materials, Productivity, and Lean Strategies (3<sup>rd</sup> ed.)**. Tinley Park, IL: Goodheart-Willcox. ISBN: 978-1-60525-569-9

A copy of the **lecture notes** is required and is available online from the course listed in each Modules section.

**Print it out before coming to class.**

### **Required Activities Scheduled Outside of Regularly-Scheduled Class time (fees, tickets, procedures and/or forms required):**

Review lecture notes, read textbook, prepare presentations/assignments.

**Department Website:** <http://www.uttyler.edu/cbt/hrd/tech/>

**Commencement:** Saturday, May 4<sup>th</sup> at 1:00 pm – **Be there by noon at the very latest!**

### **Holidays:**

Spring Break for Students and Faculty    March 11-15

### **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.

### **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>

### **Campus Carry**

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>

### **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 TurnItIn, 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)
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.

### **EXPECTED CLASSROOM ETIQUETTE**

The University of Texas at Tyler is committed to promoting a level of classroom etiquette that is conducive to maximum teaching and learning. Therefore, the following etiquette is expected of students:

1. Attend class each time the class meets.
2. Be on time for class and remain for the entire period. Students are inconsiderate of their classmates when they arrive late and leave early.
3. Refrain from talking while the teacher or another student is lecturing. Idle chattering and giggling are disruptive to the class and disrespectful to the teacher and classmates.
4. Without prior approval from the instructor, students are not allowed to use cell-phones, devices with earphones or any other electronic device (including laptops) in class.
5. Be attentive and participate in class.
6. Refrain from eating and drinking in the classroom.

**Academic Dishonesty:** The University of Texas at Tyler has a “zero tolerance policy” on plagiarism. Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is 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 an unfair advantage to a student or the attempt to commit such acts. For purposes of this class, scholastic dishonesty occurs if you:

- Quote or paraphrase a source without properly citing it.
- Misquote or misrepresent an outside source.
- Pass off any portion of an outside source as your own.
- Turn in for credit any paper that has been purchased through the internet, copied from the internet, or cut and paste a source from the internet.
- Turn in a paper written by someone else.

The penalties for academic dishonesty vary, ranging from an F on an assignment, an F in the course, or expulsion from the university, depending on the severity of the incident. The Office of Student Affairs keeps

records of any suspected case of scholastic dishonesty, and instructors are required to alert them if we believe a student has plagiarized or cheated in any way.

**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.

**Late Work:**

All work not turned in on time will have an automatic reduction in value to 50% of its full value. **Work that is not turned in by the next class will NOT be accepted.** Exceptions to this will be as per University Policy concerning absences from class. If you know an assignment will be late for a valid reason, inform your instructor in advance to avoid unnecessary penalty.

**Format for Reports:**

Each laboratory report or textbook assignment must contain the following:

1. Title page with assignment title bolded and list the chapter number if applicable
2. Prepared by: Your name here
3. Your Section Number: .001 or .002
4. Course Name and Number: TECH 4317 Computer Integrated Manufacturing
5. Date: April 15, 2035
6. Instructor's name (i.e., Submitted to Dr. Mark R. Miller)

Your grade will reflect the quality of the presentation. All of the report must be typed and stapled together.

**Cell Phones, Tablets, and Laptops:**

Cell phones, etc. are not to be seen nor heard. Make sure you turn off your cell phone during class or turn it to the vibrator mode. A ringing cell phone is a distraction and is inappropriate for the classroom. Allowing your cell phone to ring and then answering it is very rude. It is not fair to your fellow classmates who have paid for this course. **Please be considerate and make sure your cell phone is turned off during any of your classes. Students will be asked to leave for the day if this behavior continues. Absolutely no texting or looking at your cell phone during class.**

Laptops, tablets, etc. will **NOT** be tolerated as well. Buy a paper version of the textbook, not the downloadable. Students have totally abused the laptop option so that is why they are not allowed.

**Discrimination:**

The policy of this department is to make your college experience as pleasant as possible. However, if at any time you feel that you are being discriminated against, belittled, or not treated appropriately, please notify the instructor either anonymously or in-person **immediately** after class. It is not the intention of any of the faculty in this department to make your college experience an unpleasant one. Remember, the first step in the process is to inform the instructor so s/he can be made aware of the problem and take corrective action. If the problem continues to persist, please inform the chair of the department. The dean can then be notified if the problem continues to exist after a few days. A grievance can then be filed in the Office of Student Services if there has still been no change in the instructor's behavior. **It should be noted that filing a grievance is a serious act and should NOT be done so just because you received a bad grade on an exam or in the course. Communication is an effective tool to solve problems and is rarely used enough. Most people are not deliberately trying to upset you, they are just not aware of your vantage point.**

**Talking:**

While the instructor is talking, it is understood that no one should be talking. Students talking in class prevent other students from hearing the instructor and learning the material that is required to pass the course. If you are caught talking then you will **earn a zero on your daily quiz** grade. On the second offense, **you will be asked to leave**. This behavior is rude and disruptive and most students who talk in class typically earn lower grades. It should be noted, that students who have been granted permission to talk by the instructor should not be interrupted as well.

**Offensive Language:**

Any type of offensive language will not be tolerated in the classroom or laboratory. How you speak to your friends outside the classroom is your business, however, when you are in the classroom you must follow The University of Texas rules of conduct. **You will be asked to leave if your language or conduct is offensive.**

**Lecture/Laboratory Materials:**

Students will be required to provide the following:

1. ASTM or OSHA approved safety glasses
2. Notebook and paper to take notes
3. Lecture notes available in each module
4. Pen and pencil
5. Hearing protection
6. 3 - Scantrons (Exam type) #882-ES
7. Textbook (hardcopy, NOT an online copy)

**Important Dates:**

Martin L King, Jr. Holiday	January 15
Spring Term, Classes Begin	January 16
Census Date (12th Class Day)	January 23
Registration for all summer sessions	February 1
Last day to file for Summer Graduation	February 15
Spring Break for Students and Faculty	Mar 11-15
Final Filing Deadline for Spring Graduation	March 1
Last day to withdraw from a 15-week course	March 25
Registration for grad students and seniors	April 1
Registration for juniors	April 2
Registration for sophomores	April 3
Registration for freshmen	April 4
Final Exams for Spring Term	April 29-May 4
Spring Commencement	May 4 at 1 pm (Saturday) <b>Be there by <u>noon</u> pm at the latest!</b>