

# East Tennessee State University

## ENTC/MGMT 4357/5357 • CIM Applications

### Course Syllabus • Fall 2022

#### Instructors

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#### Covid-19/SARS-CoV-2/Coronavirus Response

The pandemic is not 'over.' Please get fully vaccinated and boosted; please feel free to wear a mask or other appropriate face covering to class especially if you have been exposed (even if you are not experiencing symptoms). Getting vaccinated **and** wearing a mask that covers your nose and mouth communicates the care and respect you have for yourself, the care and respect you have for those you live with, and the care and respect you have for other members of this classroom community. The best evidence we have, from public health professionals, is that getting vaccinated provides protection from hospitalizations. Wearing masks is one of the best ways to protect against the spread of COVID-19 and its variants and other airborne illnesses. For the safety of your classmates, your instructor(s) and staff; **if/when reported cases spike locally and you choose not to wear a mask, you may not be able to participate fully in team-based lab activities face-to-face.** If you forget your mask the department will have a few available each day to distribute. Students with medical conditions that inhibit their ability to wear masks should register through [disability services](#).

Additional information including the revised Academic Calendar for the Fall 2022 semester is available at <https://www.etsu.edu/coronavirus/>.

#### Course Description(s)

##### ENTC 4357/5357 CIM Applications MGMT 4357/5357 CIM Applications

A multidisciplinary course designed to permit students to engage in research and activities to develop and implement CIM systems applicable to small-to-medium sized enterprises and small-lot production. Product development, team-based problem solving, and project management activities are emphasized. Lecture & Laboratory.

## Objectives

Upon the successful completion of the course, the student will have developed and demonstrated:

- Designing, planning, and conducting multidisciplinary research and product development in a team setting into CIM applications concerning small-to-medium sized enterprises
- Current state-of-the-art CIM applications and tools and the appropriate use of these tools in a project setting
- The business and technical factors involved in process planning and automation including design, development, implementation, and operational costs and the relative pay back
- The skills involved in integrating one's own technical competence area with the other technical areas in CIM, working in team problem solving situations.

**Note:** For certain engineering technology students, this course is considered a programmatic capstone experience. Course outcomes are in alignment with ETAC of ABET Manufacturing ET (MET) program criteria Criterion 3.B.1. (1-5) and 3.B.2. (6a-e):

1. an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline;
2. an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline;
3. an ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;
4. an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes; and
5. an ability to function effectively as a member as well as a leader on technical teams.
6. Graduates must demonstrate the ability to apply the following to the solution of manufacturing problems to achieve manufacturing competitiveness:
  - a. materials and manufacturing processes;
  - b. product design process, tooling, and assembly;
  - c. manufacturing systems, automation, and operations; and
  - d. statistics, quality and continuous improvement, and industrial organization and management.
  - e. Graduates of baccalaureate degree programs must have a capstone or integrating experience that develops and illustrates student competencies in applying both technical and non-technical skills in successfully solving manufacturing problems.

## Required Textbooks:

Goldratt, E.M. & Cox, J. (2014). *The goal: A process of ongoing improvement* (30th anniversary ed.). Great Barrington, MA: North River Press. ISBN-13: 978-0-88427-195-6; or

Zimmerman, D.W. & Motter, D. (2017). *Eliyahu M. Goldratt's the goal: A business graphic Novel*. Great Barrington, MA: North River Press. ISBN: 978-0-88427-207-6.

ETSU College of Business & Technology (2019). *Language Skills Handbook*, (On-Line Ed.). Johnson City: Author.

Available URL: <https://faculty.etsu.edu/hemphill/langskil/>

Other reading materials may be required. See instructors for details.

## Required Materials:

When in the laboratory, a pair of **safety goggles or glasses** (plastic lenses with side shield protection) is **required** as is **closed toe footwear** (Note: sandals, flipflops, "barefoot" running shoes, etc. are not appropriate). **An appropriate facial cover is** encouraged when on campus and **required when working in the ET labs**.

## Recommended Textbooks:

- Brooks, F.P. (1995). *The mythical man-month: Essays on software engineering* (2<sup>nd</sup> Ed). Boston: Addison-Wesley. ISBN-13: 978-0201835953
- Blanchard, B.S. & Fabrycky, W.J. (2010). *Systems Engineering and Analysis* (5<sup>th</sup> Ed.) Upper Saddle River, NJ: Prentice Hall Intl. ISBN-13: 978-0132217354
- Groover, M.P. (2007). *Automation, Production Systems, and Computer-Integrated Manufacturing* (3<sup>rd</sup> Ed). Upper Saddle River, NJ: Prentice Hall. ISBN-13: 978-0132393218
- Arnold, J.R.T., Chapman, S.N. & Clive, L.M. (2008). *Introduction to Materials Management* (6<sup>th</sup> Ed.). Upper Saddle River, NJ: Prentice Hall. ISBN: 978-0132337618  
(**Note:** A used 4th or 5th Edition (ISBN-13: 978-0131128743) of this text is OK.)
- Kalpakjian, S. & Schmid, S.R. (2010). *Manufacturing Engineering and Technology*, (6<sup>th</sup> Ed.). Upper Saddle River, NJ: Prentice Hall. ISBN-13: 978-0136081685  
(**Note:** A used 4th or 5th Edition (ISBN-13: 978-0131489653) of this text is OK.)

## Information Technology Usage

CIM Applications seeks to be a course that mimics the real world of business and industry. Accordingly, students must demonstrate—throughout the semester—significant use of various PC and on-line applications—including but not limited to on-line resources such as D2L (ETSU Content Management System) and virtual conferencing applications (e.g., Zoom, MS Teams, Google Meet, etc.)—for a significant portion of the non-classroom product development, project coordination, file sharing, presentations, and communications using a mix of E-mail, group-based Discussion Boards, data transfer, file sharing, etc.

## Assignments & Evaluation

It is expected that each **STUDENT** will accept the primary responsibility for achieving the course objectives and **will—through self-initiative—complete all assignments on time**.

### Attendance

Attendance and participation, as noted below, is counted for grading purposes. **Accommodations will be made regarding campus access during the Coronavirus/Covid-19 response period.** Students are expected to attend each offered class session in person/on campus &/or when offered on-line (AKA a "Zoom class") and participate synchronously in team meetings within Zoom breakout rooms. Attendance will be taken at some time during each class meeting. The Fall term Monday/ Wednesday sections will meet about 30 times; each meeting represents approximately 3<sup>1</sup>/<sub>3</sub>% of the available classroom time. **Your presence and participation are important.** As an integral member of at least two project teams, you will be expected to be present for all team meetings during class periods dedicated to lab activity. When suitable supervision is present, lab facilities will be available during the class meeting times on Fridays and during posted open lab hours.

Three or more unexcused absences may result in reducing your grade; i.e., an A becomes an A-, an A- becomes a B+, and so on. If you know that you will be absent from class for an authorized University activity or suitable business commitment, please let one of the instructors know before hand. If unique problems arise, consult with an instructor ASAP.

**Weather:** Classes are seldom canceled; cancellation announcements will be made using local television or radio media. The University radio station is WETS, 89.5 FM.

Project success will depend upon individuals and team members showing up and actively participating in class during normally scheduled course meeting times as well as working outside of scheduled class times. Students scheduled for working in one or more of the labs are expected to be prepared and "on station" before the class begins (i.e., in the classroom or already working in the lab(s) and wearing mandatory PPE).

### Honor Code, Academic and Classroom Misconduct:

#### 2018-19 ETSU Undergraduate Catalog, Student Conduct and Rights, Honor Code:

"East Tennessee State University is committed to developing the intellect and ethical behavior of its students. Students found to be in violation of policies on plagiarism, cheating, and/or fabrication will be held accountable for their actions. Any knowledge of academic misconduct should be reported. Students are expected to act with honesty, integrity, and civility in all matters."

From the [ETSU Undergraduate Catalog](#)'s section on [Student Conduct and Rights, Student Disciplinary Policies, Academic and Classroom Misconduct](#):

"(B) Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly, through participation or assistance, are immediately responsible to the instructor of the class. In addition to other possible disciplinary sanctions which may be imposed through the university's academic misconduct policy as a result of academic misconduct, the instructor has the authority to assign an "F" or a zero ("0") for the exercise or examination, or to assign an "F" in the course."

For additional information, please see the [ETSU Plagiarism Policy](#).

#### Evaluation Criteria

1. Attendance in scheduled synchronous Zoom sessions & team participation ..... 45 %
  2. Final (term) paper: Compare & contrast this project and your participation and experiences with the text, *The Goal* ..... 35 %
  3. Oral/Writing assignments (status reports, issues statements, summaries, etc.) ..... 10 %
  4. Peer-review class/laboratory project participation & contributions ..... 10 %
- Oral and written group lab activity/ project status reports & presentations. The team status reports will each comprise 10% of your course grade. The final project report and presentation(s) will comprise 30%, for a total of 40%; the final report must contain no less than five different and relevant literature citations (of which three must be **non**-Internet). The nature of the lab assignments/projects will be developed as the semester progresses and the project teams and responsibilities become apparent.

All out of class communications should be accomplished using ETSU's E-mail facilities, D2L group discussions, &/or virtual classroom applications. As a registered student, you have access to the server account via your username (i.e. E-mail or "Z-name"@goldmail.etsu.edu) and the off-campus D2L server(s). Contact the ETSU OIT Student Helpdesk (439-4648) for more information.

**Copies of all class-related E-mails should be Cc'ed to both instructors' accounts.**

**Grading (on a percentage basis)**

	100 - 92 = A	>92 - 89 = A-
>89 - 87 = B+	>87 - 82 = B	>82 - 80 = B-
>79 - 77 = C+	>77 - 72 = C	>72 - 70 = C-
>69 - 67 = D+	>67 - 62 = D	>62 = F

Students with documented needs for note taking, test taking, or other classroom accommodations should make arrangements with the instructors early in the term.

Contact ETSU Disability Services at (423) 439-8346

Fax: (423) 439-8489; TDD: (423) 439-8370

URL: <http://www.etsu.edu/students/ds>

## **University and Departmental Facilities**

Students may work in labs only in the presence and under the supervision of a state employee (faculty member or graduate assistant). Students may never work alone. The dates and times of additional laboratory access will be posted during the term. The University's Syllabus Attachment page is available on-line at the following URL: <https://www.etsu.edu/reg/academics/syllabus.php>.

To log onto any University PC or the "ETSU" network, you must know & use your ETSU user/E-mail name and password. If you need assistance, please contact the ETSU Office of Information Technology Services (ITS) at 423-439-4648 or [itshelp@etsu.edu](mailto:itshelp@etsu.edu). As access to the department's PC labs may be limited, it is suggested that, for computer work other than CADD, you consider using PC labs on the main campus. For information on location and operating hours of other University computer labs, visit the ITS Help Desk web site at <https://www.etsu.edu/helpdesk/default.php>.

## **Public Safety & Emergency Preparedness**

Information regarding public safety and emergency preparedness at ETSU is available at the following URL: <http://www.etsu.edu/safety/>.

Students should become familiar with ETSU's general emergency procedures (URL: [https://www.etsu.edu/safety/emergency\\_preparedness/](https://www.etsu.edu/safety/emergency_preparedness/)) and install the ETSU Safe Mobile App (URL: [https://www.etsu.edu/safety/etsu\\_safe.php](https://www.etsu.edu/safety/etsu_safe.php)).

Per Tennessee law, a small, limited population of faculty and/or staff is authorized to carry concealed firearms for individual self-defense in certain parts of campus. An authorized weapon must remain appropriately concealed and in control (i.e., on the body or carried item such as a purse) of the individual at all times.

Except for authorized law enforcement personnel, visible weapons are not allowed on campus. You are encouraged to report any weapon &/or suspicious activity as soon as possible to ETSU Public Safety at (423) 439-4480 or using the confidential, on-line Bucs

Report It/Silent Witness Form at <http://www.etsu.edu/dps/bucsreportit.aspx>. The general rule holds: If you see something, say something!

## **Food, Drinks, and Tobacco Products**

Food, drinks, and the use of tobacco products (of any type) are never permitted in any of the University labs or multimedia classrooms. Bottled water is allowed in the multimedia classrooms; please be careful and clean up after yourself.

Tobacco products *of all types* are no longer permitted on campus\*.  
Tobacco is bad for you; any and all types can and will eventually kill you.  
You have been warned; don't play cute. Resistance is futile.  
(\*except, of course, in your own vehicle in a designated parking area)

## Rules & Guidelines for Departmental Rooms & Computer Labs

1. No food, drinks, or tobacco products are to be consumed in the multimedia classroom or the lab areas. (Note: Bottled water with caps may be brought into classrooms and labs). The classroom, lab, and break areas must be kept clean at all times; please clean up your mess when you leave.
2. No tobacco products—of any type—may be consumed or used inside the building.
3. Only bottled water may be brought into the Multimedia Classroom (WW 205); no food.
4. Save and save often. *Save on at least three different physical media:* i.e., one hard drive (typically, on the STUDENT drive or folder) &/or removal media (e.g., USB drive, &/or CD-ROM/DVD) &/or E-mail server(s) (e.g., from your Goldmail to Gmail accounts).
5. Remember that project data is a shared resource; please neither be stupid nor inconsiderate. For instance, when using the “XYZ computer,” use the appropriate folder on the C: drive to store class files. Files stored on the desktop are subject to random erasure. Also, if you chose to work from a USB drive, not only are you flirting with disaster but your team members cannot access your latest work file in the advent of your absence. Copy from your USB; work from the PC's HDD or the network drive.
6. No unauthorized personnel are allowed in the computer labs (e.g., girl or boyfriends, significant others, children, roommates, tattoo buddies, etc.)
7. Do not give the door combination, usernames, &/or passwords to anyone.
8. Be respectable of others when using the external speakers. It is strongly recommended that you bring your own headphones or ear buds.
9. Follow all directions when submitting assignment files electronically. Put all of your files on the *STUDENT* drive in the proper directory.
10. Store your files on the lab machines at your own risk. All temporary files will be deleted on Saturday morning. All data files are subject to erasure after the last semester final is given.
11. Students may never install any software on any lab machine.
12. Do not change desktop settings or screen savers. Store any desktop icons and shortcuts in your Z-account directory.
13. Do not remove or install equipment (e.g., personal laptops) to the network; use WiFi.
14. Do not illegally copy software.
15. No viewing or downloading pornographic materials in the lab; ETSU's Acceptable Use Policy is applicable for all usage of PCs and University-related E-mail account(s).
16. Do not lock the computers for more than 15 minutes (i.e., bathroom breaks are acceptable but don't go to lunch and expect to return to the same computer.
17. Do not turn the machines off. Log out and turn off the monitor when finished.
18. Promptly report any problem(s) to your instructor, to Ms. Loretta Fritz <<mailto:bradleyl@etsu.edu>> or the technical support workers. When reporting difficulties, please note the machine name, the nature of the problem, and any out of the ordinary events, error messages, etc. Use the “Fault Report” logs when available.

## Machine Tool & Wood Technologies Laboratories Procedures and Rules

All students are expected to exercise caution with respect to the health and safety of themselves and others. When the class is in the lab for an activity or demonstration, the following procedures and regulations are to be observed at all times:

- a) If you are not certain that what you are doing is a safe procedure, then **DON'T DO IT!** Ask an instructor—that's what they are here for!
- b) Safety goggles or safety glasses with side shields must be worn whenever you are in the laboratory. This is a state law as well as a part of the federal Occupational Safety and Health Act (OSHA) wherein **EMPLOYEES** as well as employers can be heavily fined for unsafe practices.

Students without eye protection will not be permitted in the laboratory until eye protection is secured.
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- c) Report all injuries (no matter how minor) to your instructor—to protect yourself.
- d) Scuffling, "horse-play," and "practical" jokes are considered to be the acts of idiots and are not tolerated in the laboratory.
- e) Excessively long hair can be hazardous around machinery and must be restrained.
- f) Be certain all safety devices and guards are in place and operational. Do not operate unguarded machines.
- g) Lift heavy objects safely, preferably using mechanical devices. If you **MUST** be a hero and lift manually, at least do it correctly. Lift with the legs, keeping the spine vertical. Remember, spinal injuries are permanent—they never completely heal.
- h) Never blow compressed air towards another person.
- i) Only one person should be operating a machine at any one time.
- j) Be certain the work piece and cutter is securely and safely mounted in your machine. If you are not certain, ask your instructor to check your setup.
- k) Keep your fingers away from revolving cutters and work.
- l) **NEVER** operate a machine while wearing gloves. The glove could become caught in the machine and pull your hand or arm into the machine.
- m) **NEVER** leave a running machine unattended.
- n) Always stop a machine to make adjustments, take measurements, remove chips, or to lubricate and keep loose tools from accumulating on the machine.
- o) Use a brush (or pliers) to remove chips (never your hands).
- p) Roll up your sleeves and remove all rings, watches, bracelets, necklaces, neckties, or anything else that might conceivably become caught in a machine.
- q) Do not leave chuck keys in a chuck (lathe or drill press), even for an instant.



## **Selected Bibliography**

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