NHTI – Concord's Community College
Mechanical & Manufacturing Engineering Technology

COURSE SYLLABUS (revB)

Title: Computer Integrated Manufacturing

Course #:	MFET241C	**Delivery Method:**	Face – to - face
CRN:	25127	**Lecture - Day(s), Time, Room:**	MR, 1:00pm – 3:50pm, L109, L110, L112
Semester / Year:	Spring 2018		
Credits:	4		

SECTION I: General Information & Outline of Course Requirements

Catalog Description: A study of flexible industrial automation as it applies to product-producing industry. Particular emphasis is on robotics, numerical control and computer integrated manufacturing. The basic theory and application of these areas are studied. In the laboratory portion of the course, the student has the opportunity to set up, program, and operate all aspects of a computer-controlled manufacturing system. Programmable logic controllers, vision systems, and a variety of robotic devices and CAM capabilities are included.
Course Prerequisites: MFET 202C and MFET 220C

Instructor Contact:
Instructor – Dennis Tappin
Email – dtappin@ccsnh.edu
Office Location – L125
Office Hours – Monday 10:00am – 12:00pm ; Thursday 9:00am – 12:00pm; by Appointment
Phone – (603) 548-1096
Email Response Time: *At a minimum, the instructor will check CCSNH email each day/night and respond accordingly, typically within 24 hours, please be patient with email responses.*
Other contact methods: *It is acceptable to SMS the instructor at the given phone number. If using this method of communication, students must identify themselves accordingly.*

Required Textbooks:
Mastercam 2018 Mill Essentials Training Tutorial, Lendel, In-House Solutions Inc. 2018
ISBN 978-1-77146-644-8 (www.emastercam.com)

Mastercam 2018 Mill Advanced Training Tutorial, Lendel, In-House Solutions Inc. 2018
ISBN 978-1-77146-645-5 (www.emastercam.com)

Supplemental Materials: *Required – Standard Educational Materials (USB Drive or Cloud Storage, Pen, Pencil, Notebook,* ***Calculator****, etc.);*

Course Learning Outcomes:

1. The student will learn basic CNC programming techniques using manual G-code programming language.
2. The student will learn to use CAM software in order to generate CNC programs (G-code) from CAD modeling data.
3. The student will become familiar with simulation software which is used to emphasize lecture material. These include CNC programming and machine simulation, robotic setup, robotic programming, and simulation.
4. The student will learn the basics of robotics and various programming methods as well as "End Effector" design.
5. The student will become familiar with the concepts and components of hard and flexible automation.
6. The student will learn about other automation concepts and components that comprise the CIM function.
7. The student will: recognize the need for and develop the ability to engage in self-directed continuing professional development; develop the ability to understand professional, ethical, and social responsibilities including a respect for diversity; and develop a commitment to quality, timeliness, and continuous improvement.

Course Objectives:

1. Provide a basic understanding of computer software technologies and how each are related to and integrated with the manufacturing environment.
2. Give students an understanding of traditional material removal methods and equipment used in industry.
3. Provide a basic understanding of hardware technologies and how each are related to computer integrated manufacturing.
4. Present the integration of automation components through demonstration and hands-on laboratory projects.
5. Demonstrate the safe use of automated equipment in the production of product.

Instructional Approach: This course will balance in class lecture on various manufacturing topics, in class activities, hand-on lab based projects and demonstrations, and independent reading/study. As needed, time will also be dedicated to in-class assessment.

Course Assignments: This course will use various assignments to reinforce discussion and laboratory work. The following is a general list and description of assignments expected to be given over the term. This list and any requirements are subject to change at the discretion of the instructor.

- *Manual CNC Programming Assignments (~3)*
- *CAD/CAM Programming Assignments (~6)*
- *Robotics Programming Assignments/Tests (~3)*
- *CAD/CAD & FMS Integration Projects & Reports (~4)*

Assessments of Learning:

10% Attendance, Participation, and Professionalism

80% Assignments/Homework/Quizzes (equally weighted)

10% CAD/CAM & FMS Integration Projects & Reports (equally weighted)

Note on Assessment: The instructor may ask a student, at any time, to explain submitted work and/or work in progress. Examples may include explanation of details related to how a problem was solved or why a lab exercise results were achieved. It is at the discretion of the instructor to incorporate student's responses to such inquiries into a related assessment.

Course Grading System: The "C" grade represents achievement of a level of understanding and ability consistent with that required for successful entry into the field of Engineering Technology and is therefore the minimum acceptable grade for major field courses.

Letter	Numeric	Letter	Numeric
A	94-100	C	73-76.99
A-	90-93.99	C-	70-72.99
B+	87-89.99	D+	---
B	83-86.99	D	---
B-	80.00-83.99	D-	---
C+	76-79.99	F	Below 70

Incompletes: An Incomplete Grade (I) indicates that a student has not completed a major course assignment (usually a final exam or culminating final assessment) due to extraordinary circumstances, such as serious illness, death in the family, etc. The grade is applied only in those instances where the student has a reasonable chance of completing the outstanding work and passing the course. It is not intended to give an extension of time for a student delinquent in meeting major course responsibilities.
Administrative Failure: The instructor may issue a grade of AF (Administrative Failure) to a student at any point in the semester for reasons unrelated to grade performance (e.g. violations of the student code of conduct, or unsafe / disruptive behavior). An AF is calculated into the GPA as an F; accordingly, it may affect a student's financial aid status. An AF may also be issued for attendance per NHTI policy.

Course Schedule: A course schedule outlining the topics to be discussed, exams, and the assignments/labs/projects to be completed will be published on the course LMS site. This schedule is considered part of this syllabus. The schedule is subject to change throughout the semester at the discretion of the instructor, any changes will be communicated either in-class and via the course LMS site as soon as possible.

Attendance, Participation, and Professionalism:

Participation is a major component of this course. It is expected in the workplace that you are an active participant which includes working well with others, taking initiative to complete tasks, staying on task, aiding your co-workers. You will be assessed, in general, per the following criteria:

Student is highly active in discussions and with their engagement with all assignments. Contributes multiple ways: timely homework, initiates discussion topics, actively and appropriately responds to comments. Participation adds new information, questions, and considerations. Contributions from the students are based on class readings, personal and work experiences, and are appropriate.

Attendance is expected at all scheduled lectures and lab sessions. Students are expected to be on time for all sessions. It is expected that you contact the instructor prior to class if you will be unable to attend. No shows to class without notification will impact your participation grade for this course. Also, multiple absences, even with notification, can impact your final grade. Tardiness that impacts instruction or disrupts class can also impact your final grade.

Missing 2 consecutive class sessions or 4 absences over the course of the term may lead to dismissal from the course.

General Disclaimer: In addition to the policies outlined herein, the NHTI Academic Affairs Notice as posted on the course LMS site for the related term is considered part of this syllabus. The student handbook, code of conduct, and all published NHTI policies apply to the execution of this course. In a case where there is a conflict between this syllabus and another NHTI policy. The NHTI policy will supersede this document. Any questions or concerns about the course or any guiding policy should be directed to the instructor.

SECTION II: Additional Instructor Policies and Expectations

Homework Return Policy: Grades and feedback for all exams and assignments will be posted on the course LMS site, hardcopies of submissions will not generally be returned. Participation grading is ongoing, if you are not expected to receive full credit for this part of the course it will be due to poor attendance, lack of active participation, or lack of professionalism.

Student Work Policy: In participating in this course you are permitting the MFET/MCET Department and the instructor to use your work produced as artifacts for purposes of department/college accreditation, as teaching resources, research, publication, and/or as promotional materials. This may involve the reproduction of work in whole or in part. Should you not agree with this, please notify the instructor. If any work submitted is to be discussed in class during the execution of the current term, the instructor will be required to ask student permission.

Student Email Address Policy: NHTI requires all students to use their CCSNH email address for communicating with their instructors. Faculty are not responsible for the content of lost or quarantined emails sent from an outside email account.

Canvas Usage Policy: Materials used in the class will be posted on course Learning Management System Site (Canvas) along with grades and announcements. It is expected that student become familiar with any/all materials posted. Students are also expected to learn to navigate the system.

Cancellations: A variety of methods are used to alert the NHTI community to college cancellations and closures. Please become familiar with all NHTI alert methods per the academic affairs notice. If in the event the instructor will not be able to attend a class/lab session, the instructor will inform all students via email and post an announcement on the course LMS site.

Homework, Quizzes, Make-up, & Late Work Policy: *Due dates for all assignments will be posted on the course LMS site, published in the course schedule, and/or discussed in class. It is the student's responsibility to pass in work by the required due date. Late work will only be accepted if prior arrangements have been made with the instructor and or related to a missed lab/class session. Make-up will be discussed on a case by case basis. Make-up should be discussed prior to any due date, lab session day, or exam date whenever possible. Make-up, re-takes, late submittals are all at the instructor's discretion.*

Technology Use Policy:
Laboratory Sessions - General use of technology during laboratory sessions is a safety concern and only allowed at the discretion of the instructors. Use of technology for the purposes of recording (photo, audio, or video) is acceptable.
Lecture Sessions - Technology use is at your discretion. However, please know that continued use of technology for calls, texts, or apps (unless used as a tool to support classwork) will be noticed and

reflected in your participation grade. You are expected to be courteous and professional with the use of technology at all times.

Safety Regulation/Rules/Practices: Safety in the workplace is paramount and should be everyone's concern. **All MCET, MFET, RAET, INDS Department Safety Rules and Regulations apply to all labs/shops, as well as specific safety practices for individual equipment.** The department Safety Rules and Regulations are updated on a regular basis. The latest edition of the Department Safety Rules and Regulations will be posted on the course LMS site. Each semester which involves a course with major machine tool equipment use requires the successful passing of a Safety Test appropriate to the course. Violation of the safety rules will not be tolerated. Equipment in the engineering technology labs is very expensive and can become very dangerous if safety rules and regulations are not followed. Student safety is the prime concern and protection of the equipment in the lab is a second priority. Blatant disregard or continued neglect of safety rules, regulations and/or practices will result in expulsion from the course, and could/may result in dismissal from NHTI as well as resulting grade consequences.