Mechanical & Manufacturing Engineering Technology Program
CONCORD, NEW HAMPSHIRE

Spring 2018 Semester

Course Number: MCET 105   **Course Title:** Engineering Design

Hours per week: Lecture 4   **Lab** 0   **Credits:** 4

Catalog Description:

This course introduces students to the fundamentals of engineering design and professional practice through the use of hands-on projects. Students will learn about the design cycle and the necessary steps to complete a successful project as a member of a team. Topics include problem identification, brainstorming, drawing and documentation, reverse engineering, testing and evaluation, and manufacturing. Cost, safety, and environmental issues are considered as well as ethical and professional responsibilities. Students will document designs using industry standard 3D modeling software and will be required to communicate their designs through written, oral, and graphical presentations. *(This course replaces PLTW 101 Introduction to Engineering Design.)*

Required Textbook, Resources and Supplies:

Required: Engineering Graphics essentials, 5th edition, SDC Publications   ISBN#: 978-16057-052-13   By Kristie Plantenburg

Resources: SolidWorks 2017 Educational Version will be used and is available in our computer labs.
An *optional* free download of the software is available for students' personal computers.

Supplies: USB Mass Storage Device for SolidWorks files
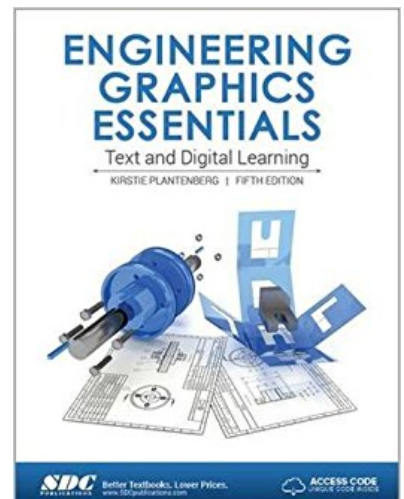
Methods of Testing / Evaluation:

Grades will be based on the following criteria:

In-Class Activities	5%
Assignments	20%
Projects (3)	40%
Tests (2)	20%
Final Project / Exam	<u>15%</u>
	100%

Attendance Policy:

Attendance is expected at all schedule classes. In class exercises will be given throughout the semester and will be used as an attendance grade. If more than 3 class sessions are missed, termination may result. Students experiencing difficulty with the coursework are urged to make arrangements for extra help. Speak to the instructor about arranging a mutually agreeable time.

Policy on Makeup Work:

Work missed due to a validated absence may be made up at the convenience of the instructor. It is the responsibility of the student to contact the instructor immediately after said absence. Arrangements not made within one week of the missed work will not be accepted.

Policy on Drawing Assignments:

Regular drawing assignments and drawing projects will be assigned in class. Due dates will be announced in class. Late assignments will be accepted up to one week late and will be reduced one letter grade. Assignments submitted beyond one week late will be accepted at the discretion of the instructor, but at a substantial penalty.

Drawing assignments should be neat and legible. The quality of the work submitted is part of the grade for the assignment. Proper sketching and lettering technique should also be used for all assignments. All hand sketching assignments will be done in pencil on graph paper. Details of each assignment requirements will be announced in class. Engineering drawing is the basic language used among engineers of various disciplines and proper drawing practices will be emphasized and implemented.

Course Grading System Including letter grade/numeric equivalents:

A 95-100	B+ 87-89	C+ 77-79	F 0-69
A- 90-94	B 84-86	C 74-76	
	B- 80-83	C- 70-73	

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.

Professionalism:

Honesty is expected of all students. Students are to work on and complete their own assignments at all times. Often in a lab setting, students may be asked to help one another from time to time, but each student is expected to submit their own original work. Copying of drawing files and/or submission of another person's work as one's own will be considered cheating. Both the person(s) doing the copying and the person(s) allowing the copying to take place will be held accountable. Protect your own work! Plagiarism/cheating is a serious offensive and will be treated according to the guidelines outlined in the NHTI Student Handbook. Penalties may range from a "zero" grade for the given assignment, an "F" grade for the entire course, or dismissal from NHTI.

Students are expected to show proper behavior in the classroom and laboratory. Each student is expected to act as a professional as would be expected in industry. This includes the use of appropriate and proper language and attitude toward the instructor and other students. Improper behavior will not be tolerated. Cell phones should be turned off or set for vibration mode during the lecture and lab periods. If it is necessary to respond to a call/text, please leave the classroom as to not distract others around you.

Academic support:

The Academic Center for Excellence (ACE) provides a variety of services for the student, please refer to the Academic Affairs Notices attached to this syllabus for further information.

Office hours are available and posted outside the office. Other times are available by making an appointment with me in advance. I am often available during non-posted office times. Please do not hesitate to ask for additional help.

Specific Course Objectives:

1. Utilize the design process
2. Use pictorial sketching techniques to convey design ideas
3. Perform research and presentations on the design process
4. Use solid modeling software to:
   - Create 3D CAD models of original designs.
   - Create orthographic and isometric views of parts and assemblies
   - Detail dimension individual parts
   - Prepare exploded assembly drawing with Bill of Materials
5. Work as a member of a design team within established norms of communication
6. Perform measurements using standard equipment
7. Demonstrate engineering ethics through responsible selection of materials and awareness of Product Lifecycle.
8. Use MS Office applications to prepare technical documents

Semester Topics Covered to Meet Course Objectives:

Chapter	Topic
-	Design Process
-	Project 1 – Bridge Design
1/2	Orthographic Projection
-	Introduction to SolidWorks (SW)
4.	Dimensioning
-	Introduction to SW Drawings
-	Project 2 – Reverse Engineering
9.	Assembly Drawings
-	Introduction to SW Assemblies
3.	Pictorial Drawings
5.	Sectioning
6.	Advanced Drawing Techniques
7.	Tolerancing
8.	Threads and Fasteners

The instructor reserves the right to change or modify course schedule as deemed necessary to meet the needs of the course. Changes will be communicated to students in a timely fashion.

NHTI ACADEMIC AFFAIRS NOTICE

COURSE DROP/WITHDRAWAL AND REFUND

A course must be dropped by notifying the Registrar's Office or the Academic Advising Center prior to the end of the fourteenth calendar day of the semester in order to receive a 100% refund of tuition, less non-refundable fees. After that time, the student may submit a DROP form to the Registrar's Office or Advising Center but no refund will be granted. Ceasing to attend a class does not constitute an official drop or withdrawal and may result in a failing grade. Officially dropping a course prior to the completion of 60% of the scheduled duration of a course will result in a grade of 'W.' After that time, a grade of 'WP' or 'WF' will be issued depending on the student's standing at the time of the drop. Note: Dates are prorated for courses offered in an alternative format; contact the Registrar or Advising Center for details. Classes that run for less than the full semester have 7 calendar days from the start of the alternative semester to drop with a full refund. See policy at:
https://www.nhti.edu/academics/requirements-policies/dropping-classeswithdrawing-nhti

CLASSROOM ETIQUETTE

Academic integrity is of primary importance in the classroom, whether the classroom be face-to-face or online. Both students and faculty are responsible for creating and maintaining an environment that supports an effective learning community. It is therefore imperative that students and faculty demonstrate mutual respect. Inappropriate behavior may compromise the learning and performance of all students. Such inappropriate behaviors include, but are not limited to: late arrivals/early departures; loud or prolonged side conversations; use of cell phones; computers (other than for legitimate academic use); iPods (or similar devices), etc.; use of derogatory or vulgar language. All students are expected to abide by the Student Code of Conduct (https://www.nhti.edu/student-life/campus-safety/student-codeconduct-and-judicial-process) as published in the NHTI Student Handbook, as well as the CCSNH Netiquette Guidelines, and are subject to sanctions as described therein for any violations.

CIVIL RIGHTS and EQUITY ISSUES (discrimination and harassment)

NHTI is committed to creating and maintaining a positive and productive learning environment for students, a professional setting for its employees, and a community atmosphere grounded in mutual respect, dignity, and integrity. In light of these objectives, NHTI prohibits all manner of discrimination in the administration of its employment programs and practices on the basis of unlawful criteria including race, color, religion, national or ethnic origin, age, sex, sexual orientation, marital status, disability, gender identity or expression, genetic information, and veteran status, as defined under applicable law. The college is sensitive to the concerns an individual may have in coming forward with a complaint regarding discrimination. The grievance reporting procedures outlined in the Student and Employee Handbooks are designed to provide a safe, confidential, and supportive environment in which an individual may discuss his/her concerns. Retaliation of any kind against anyone making an allegation of discrimination, against anyone involved in the investigation, or against anyone involved in the decision regarding corrective and/or disciplinary action is prohibited, and will result in disciplinary action against the retaliator. Any NHTI student, employee, or visitor who has observed, is

aware of, or has been a victim of discriminatory or harassing behavior while engaged in an NHTI-sponsored activity should report such behavior to the NHTI Title IX and Equity Coordinator (Michael O'Bryant, Grappone Room G219 mobryant@ccsnh.edu 603.271.6484 extension 4269) or the NHTI Human Resources Officer (Susan Makee, Little Hall, President's Office Suite, smakee@ccsnh.edu 603.271.6486 extension 4122).

REPORTING SEXUAL MISCONDUCT, VIOLENCE, OR EXPLOITATION

At NHTI, Concord's Community College, every attempt is made to create and maintain a safe learning environment in which students feel able to share opinions and related life experiences in classroom discussions, in your written work, and in meetings with your professors. To the greatest extent possible, this information will be kept private. However, staff and faculty have a legal obligation to report information concerning sexual misconduct, violence, and exploitation of individuals per federal statute and in compliance with established policies and procedures at NHTI Concord's Community College. If you have been subjected to sexual misconduct, violence or exploitation, we encourage you to contact the NHTI Title IX and Equity Coordinator, Michael O'Bryant, Email: mobryant@ccsnh.edu or Telephone: 603.271.6484 extension 4269). You may also contact: Crisis Center of Central New Hampshire at Telephone: 866.841.6229 (crisis line). You are not alone.

Additional information including resources can be found at: New Hampshire Coalition Against Domestic and Sexual Violence: http://www.nhcadsv.org/Catchment map.pdf
uSafe (Add NHTI specific uSafe link): http://www.usafenh.org

THE ACADEMIC CENTER FOR EXCELLENCE

The Academic Center for Excellence (ACE), located in the library, provides free academic assistance to all NHTI students who would like to improve their grades. The ACE offers tutoring in Accounting, A&P, Biological Sciences, Math, Chemistry, and Physics. We also offer peer tutoring in most subjects. The Writing Center & Study Solutions Lab offers writing, reading, study skills, and online writing tutoring assistance. The Academic Center for Excellence also includes Disabilities Services and a computer lab. For more information call 603.230.4027 or visit https://www.nhti.edu/student-resources/get-help-your-studies.

DISABILITIES SERVICES

Students with documented disabilities are eligible to receive reasonable accommodations that address individual learning needs. To receive services, students must contact the Coordinator of Disabilities Services, whose office is in the Academic Center for Excellence. For details, please refer to the Policies and Procedures Manual for Services Available for Students with Disabilities, which is available in print and on the NHTI Web site (www.nhti.edu). Students with documented disabilities should be aware that simply noting in writing or in discussions with faculty that one's disability affects academic skills does not constitute formal disclosure of a disability. Once a student develops a Reasonable Accommodation Plan (RAP) with the Coordinator of Disabilities Services, that student is responsible for discussing the RAP with the instructor. Students should make requests for specific accommodations at least one week prior to when the accommodations are needed. Call Beverly Boggess at 603.230.4117 or e-mail her at bboggess@ccsnh.edu for more information.

CROSS-CULTURAL EDUCATION & ENGLISH for SPEAKERS of OTHER LANGUAGES (ESOL)
The Director of Cross-cultural Education, tutors, and staff, located in Sweeney Hall, Room S301, work together to provide the tools, strategies, and materials necessary for second language/second culture students and their instructors to access and deliver academic content, respectively. Services also include testing accommodations, socio-cultural and academic advising and support in acculturating to college and community life. Prospective students may arrange to take our institutional language placement test to allow for appropriate academic recommendations and course placement and registration. ESOL courses are offered for college credit throughout the year. An academic transition process allows students to take ESOL courses and courses required in their chosen program simultaneously. One on-one and open group tutoring and testing accommodations can be arranged through this office. Programs that assist members of the international, immigrant, and host communities are also offered to better support cross-cultural communication and to promote awareness and understanding of and appreciation for the growing diversity of our community. Call 603.230.4055 for more information, or stop by.

PLAGIARISM/CHEATING POLICY
 As stated in the Student Handbook: Honesty is expected of all NHTI students. In academic matters, this includes the submission of work that clearly indicates its source. Dishonest acts include cheating and plagiarism. Cheating includes, but is not limited to: (1) use of any unauthorized assistance from other persons or technologies in taking quizzes, tests, or examinations or in the preparation and completion of class assignments; (2) dependence upon the aid of resources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; (3) the acquisition, without permission, of tests or other academic material belonging to a member of the CCSNH colleges faculty, staff, or students; or (4) knowingly providing unauthorized assistance of any kind to another for the purpose of providing unfair advantage to the recipient in the completion of course assessments/assignments (sometimes known as facilitation). Plagiarism includes, but is not limited to, the use (intentional or unintentional), by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in providing term papers or other academic materials via direct sale, barter, or other means. Cheating and plagiarism are considered serious disciplinary matters and are subject to the same penalties and procedures as other NHTI disciplinary matters. Students should be aware that penalties levied in proven cases of cheating or plagiarism may include the issuance of a grade of 'AF' (which may in turn lead to delay of graduation), suspension, or dismissal from a program or from the college, or other sanctions as deemed appropriate.

CANCELLATION/DELAYED START OF CLASSES
When the President deems it prudent to cancel all classes at the college, students will receive a notice via their college email address using the NHTI Alerts Notification System. (To receive Alerts

messages via other addresses/phone numbers, sign up at www.nhti.edu.) An announcement will also be made on WMUR-TV (Channel 9) and local radio stations and will be posted to the NHTI Web site. Students checking the Web page for cancellation announcements should be aware that the page must be repeatedly "refreshed" to obtain the latest information. Occasionally, the President will opt for a delayed start to classes. This means that students should be prepared to begin their school day with whatever activity they would normally be doing at the announced opening time. For example, if a two-hour delay is announced, and a student is scheduled for a class that normally meets from 8:00-10:50 AM, the student should come to that class at 10:00 AM for the remaining 50 minutes of class; classes that are normally completed before 10:00 AM would be cancelled.

GRADE REPORTING

Faculty submit grades electronically to the Registrar's Office within a few days following the end of each final exam period. Final grades are not mailed to students. It is the student's responsibility to review his/her final grades via the Student Information System as soon as grades are available. Students who receive an 'I' (Incomplete) grade should coordinate with the instructor to complete the remaining coursework as soon as possible. Unresolved 'I' grades will convert to an 'F' (Failing) grade automatically at the end of the third week of the following semester. A grade of Incomplete will place a student's financial aid status on hold for the subsequent semester. Consult the NHTI catalog for the full "Incomplete Grade Policy."

STUDENT ATHLETES

NHTI values its student athletes and wants them to be successful both on the field/court and off. Therefore, student athletes participating on any NHTI-sponsored team must provide each of their instructors with documentation from the NHTI Athletic Department confirming their participation on a team, as well as the schedule of practices and games, within the first week of the semester or immediately upon joining a team (if joining after the semester begins) to receive consideration for excused absences, make-up testing, or other sorts of accommodations related to the team schedule. This documentation must be presented in advance of any special requests. Participation on an NHTI-sponsored team does not excuse any student from compliance with any/all course requirements. Faculty are not required to excuse students from class or lab to attend practice sessions, and there may be circumstances (such as clinical requirements) under which athletes may not be excused for games, though every effort will be made to accommodate the schedules of student athletes who work responsibly with their instructors.

STUDENT EMAIL

 Official Community College System of New Hampshire (CCSNH) email accounts will be created automatically for all enrolled students at the time of course registration. This is the only email address that will be recognized by NHTI for any required correspondence in NHTI controlled courses and will serve as the official account for all of your electronic communication with the college. This practice will ensure that all students are able to comply with the email-based requirements specified by faculty. Students are responsible for checking their official student email regularly and reading college-related communications. The electronic mail system is college property. Additionally, all messages composed, sent, or received on the electronic mail system are, and remain the property of CCSNH or

NHTI. The CCSNH electronic mail system is not to be used to create or forward any offensive messages. CCSNH is not responsible for the handling of email by outside vendors.

ACADEMIC CREDIT

NHTI awards academic credit in accordance with the policy of the Community College System of New Hampshire, which equates a credit hour to (1) one hour* of "lecture" per week for 15-16 weeks**; (2) 2-3 hours of lab per week for 15-16 weeks**; (3) 3 hours of practicum per week for 15-16 weeks**; (4) 3-6 internship hours per week for 15-16 weeks**; or (5) 3-5 clinical hours per week for 15-16 weeks**. In awarding academic credit, NHTI faculty create instructional plans, activities, and assessments with the expectation that students will spend a minimum of 2-3 hours outside of class per week per credit (**) in related course activities (completing assignments, studying, etc.).

*One instructional hour equals 50 minutes **All "per week" hours should be prorated accordingly for alternative-length semesters. For example, a course that meets for 3 hours per week in a 16-week semester and requires 6-9 hours per week of additional work outside the classroom would meet for 6 hours per week and require 12-18 hours per week of additional study time when offered in an 8-week format.*

Students must meet the requirements of all academic policies. Therefore, students are expected to acquaint themselves with these policies by visiting the college's Web site at: http://www.nhti.edu/academics/requirements-policies.