

## MEC 325 Manufacturing Processes Spring 2020

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**Instructor:** Noah D. Machtay, Ph.D., P.E., 146 Heavy Engineering Building, 2-9014  
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(emails will generally be answered within 2 business days)

**Office Hours:** MWF 8:30-9:30AM, HE146

**Lecture:** MWF 10:00-10:53am, Harriman 137

**Attendance policy:** Lectures are required – there will be no make-ups for announced or unannounced in-class assignments.

**Text:** Groover, “Fundamental of Modern Manufacturing”, 6<sup>th</sup> Edition, Wiley 2016

**Assignments:** Homework problems will be assigned for the duration of the semester, and will be posted along with their solutions. Homework is not graded, due to the prevalence of website selling solutions to homework sets. Homework is assigned solely for the benefit of the student, so that they may practice the principles discussed during lecture, evaluate their understanding, and, in part, prepare for examinations.

**Video Project:** There will be a video project for which students will produce a video documenting and demonstrating a manufacturing process. Details have been posted.

**Exams:** *Two midterm exams and a final exam.* Midterm 1 will be held on 3/25/2020, and Midterm 2 will be held on 4/22/2020. Final exam as scheduled by the registrar. No make-up exams will be given. Exams will be closed book and closed notes, no scrap paper is permitted.

**Assessment Questions:** In order to receive a passing grade for this class, students must answer a set of assessment questions which will be administered throughout the semester. Assessment questions represent straightforward applications of concepts which are fundamental to the topic of this course.

**Grading:** *1<sup>st</sup> midterm: 15%, 2<sup>nd</sup> midterm: 15%, Video Project: 20%, Final: 40%, Participation: 10%.*

**Cell phone and electronic device policy:** Cellular phones or other communication devices are not permitted in lectures or labs, and are especially prohibited from exams. If you are found to be in possession of such a device during an exam, you will be ejected from the exam and will receive a grade of zero. Audio or video recording or photography during lectures is strictly prohibited, and anyone found in violation will be ejected from the course with a failing grade. Students may not use personal electronic devices during lectures, exams, or lab sessions – this includes but is not limited to cell phones, laptop computers, cameras, music devices, etc.

**Excused absences for religious observance and severe illness:** From the university policy statement regarding religious holidays, students will be expected to notify their professor in advance, but definitely before the final date of the ‘add/drop’ period of their intention to be out for religious observance. Notification of intention to be out for a religious holiday **MUST** be made through the CEAS Undergraduate office, who will verify and evaluate the notification, and provide the instructor with appropriate instructions; you must include your name, SBID#, and the course number when contacting CEAS in regards to your absence. Requests for excused absences for severe illness must also be made through the CEAS office following the same procedure.

**Course Objectives:** Introduces traditional and modern manufacturing processes, their capabilities, and limitations. The properties of engineering materials are discussed in the context of manufacturing applications. The relationship between design choices and manufacturing feasibility is developed and considered. Examples of topics to be discussed include additive processes (casting, 3D printing, etc.), subtractive processes (milling, turning, etc.), forming processes (forging, bending, extrusion, etc.), and joining processes (welding, mechanical fastening, etc.).

**Pre/corequisites:** MEC 203

**Statement on Academic Dishonesty**

Academic dishonesty is an extremely serious offense and will not be tolerated in any form. Academic dishonesty in general is the presentation of intellectual work that is not originally yours. Examples include, *but are not limited to*, copying or plagiarizing class assignments including homework, reports, designs, and other submitted materials; copying or otherwise communicating answers on exams with other students; bringing unapproved aids, either in physical (written) or electronic form to an exam; obtaining copies of an exam prior to its administration, etc. Academic dishonesty violates both the ethical and moral standards of the Engineering profession and all infractions related to academic dishonesty will be prosecuted to the fullest via the CEAS CASA committee. For you, the honest student, academic dishonesty results in lower class curves, hence a depression in your GPA and class standing, while cheapening the degree you earn. Please note that failing to provide proper citations in a paper or report constitutes plagiarism and will be prosecuted accordingly. Be sure to cite your sources!<sup>1</sup>

**Allowed Calculators**

For both security and uniformity in this class **only** the following calculators will be allowed to be used on the midterm and final exams. **There will be no exceptions.** This list of calculators is identical to that allowed for the *National Council for Examiners for Engineering and Surveying* (NCEES) Fundamentals of Engineering (FE) exam that many of you will take in your senior year, as well as the Professional Engineering (PE) exam that you may take several years from now.

**Casio:** All **fx-115** models. Any Casio calculator must contain **fx-115** in its model name.

**Hewlett Packard:** The **HP 33s** and **HP 35s** models, but no others.

**Texas Instruments:** All **TI-30X** and **TI-36X** models. Any Texas Instruments calculator must contain either **TI-30X** or **TI-36X** in its model name.

Course Learning Objectives
1. Ability to analyze subtractive manufacturing processes and select appropriate feeds and speeds for cutting tools and materials
2. Ability to analyze additive manufacturing processes and identify the effects of thermal transitions on materials during processing
3. Ability to analyze joining processes and identify standard symbols and notation for engineering design
4. Ability to analyze forming processes and calculate force requirements
5. Produce a multimedia video podcast term project containing a professional presentation of manufacturing process(es) or an engineering system.

**Grading Policy:**

100-95 = A	
94-90 = A-	
89-87 = B+	
86-84 = B	
83-80 = B-	
79-77 = C+	
76-74 = C	
73-70 = C-	
69-65 = D+	
64-60 = D	
<60 = F	

Note: All grades are TRUNCATED, not rounded.

<sup>1</sup> Dr. Jon Longtin, Department of Mechanical Engineering, Stony Brook University

Approximate Course Schedule, subject to revision:

Topic 1	Introduction, Syllabus,
Topic 2	Engineering Materials and their Properties (2-9)
Topic 3	Subtractive manufacturing (20): Theory
Topic 4	Subtractive manufacturing (21): Machines
Topic 5	Subtractive manufacturing (22,24): Cutting tools, Grinding
Topic 6	Additive manufacturing (10-11): Casting, molding
Topic 7	Additive manufacturing (12-13, 32): Plastic and glass working, Rapid Prototyping
Topic 8	Additive manufacturing (15-16): Powders, ceramics
Topic 9	Forming Processes, bulk (17-18): Extrusions, forming, forging
Topic 10	Forming Processes, sheet (19): Sheetmetal forming
Topic 11	Joining (28-30): Welding, brazing, soldering, adhesives
Topic 12	Joining (31): Mechanical fastening
Topic 13	Post-processing (26-27): Heat treatment, surface treatment
Topic 14	Special Topics

University required statements:

“STUDENT ACCESSIBILITY SUPPORT CENTER (SACS) STATEMENT (must be the following language)

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, 128 ECC Building, (631) 632-6748, or at [sasc@Stonybrook.edu](mailto:sasc@Stonybrook.edu). They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website:

<https://ehs.stonybrook.edu/programs/fire-safety/emergency-evacuation/evacuation-guide-people-physical-disabilities> and search Fire Safety and Evacuation and Disabilities.

ACADEMIC INTEGRITY STATEMENT (must be the following language as approved by the undergrad council):

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>

CRITICAL INCIDENT MANAGEMENT (must be the following language as approved by the undergrad council):

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.”