

**San José State University**  
**Department of Mechanical Engineering**  
**ME/ISE 110 Manufacturing Processes, Section 01, Fall 2016**

**Course and Contact Information**

<b>Instructor:</b>	Dr. Raquib U Khan
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<b>Office Hours:</b>	Tuesdays and Thursdays 12 noon -1:00 pm, and by appointment
<b>Registration Codes:</b>	47148 (ME), 49337 (ISE)
<b>Class Days/Time:</b>	Tuesdays and Thursdays 10:30- 11:45
<b>Classroom:</b>	Engineering
<b>Prerequisites:</b>	ME 20 with a grade of "C-" or better. Corequisite: MatE 25.

***“You must turn in an unofficial transcript with the prerequisites highlighted by the second class period, or you will be dropped from the class”***

**Course Format**

This is a mixed-mode class, with both in-person and online components. Online components require use of the Canvas learning management system, accessed via <https://sjsu.instructure.com/>. Successful completion of course requirements necessitates accessing the course website frequently, typically at least twice a week on a regular basis. Technical support for Canvas is available at <http://www.sjsu.edu/at/ec/canvas/>. Important communications regarding this class may be sent via Canvas or to email addresses listed in MySJSU, and thus each student is expected to maintain up-to-date contact information in both systems.

**Course Description**

Fundamentals of manufacturing processes such as machining, forming, casting, molding and welding. Surface treatments, powder-based processes, and microfabrication methods. Materials behavior and selection for manufacturing. Geometric dimensioning and tolerancing.

**Learning Outcomes**

Upon successful completion of this course, students will be able to:

1. Identify candidate materials and processes appropriate for given design requirements.
2. Make relative comparisons among a wide variety of engineering materials in terms of mechanical properties and workability.
3. Describe capabilities and limits for several manufacturing processes in terms of size, resolution, precision, surface quality, rate, and cost.
4. Communicate effectively across design, manufacturing, and inspection perspectives, specifically using geometric dimensioning & tolerancing (GD&T).
5. Propose sensible strategies for fabricating new engineering components that have no pre-existing standard production method.

## Required Textbooks

1. Manufacturing Engineering and Technology, 7th ed., by S. Kalpakjian & S. Schmid. Prentice Hall, 2010, ISBN 9780133128741. The immediately previous edition (i.e., 6th) is also acceptable.
2. Beginning GD&T for Design, Manufacturing and Inspection, by Multi Metrics, Inc., 2013. Current version is available for purchase via Spartan Bookstore.

## Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

In addition to a Final Exam at the end of the semester, the course involves the following types of assignments:

- Participation Tasks/Home work: Throughout the semester there will be several participation tasks to promote active engagement. There are no make-up options. Tasks may be in-class or Homework or online, so it is important to attend class and to check Canvas regularly.
- Midterm exam (one)
- Quizzes: Short sets of questions to demonstrate comprehension of recent lesson material from assigned textbook reading and from lectures. Typically these will be held at the beginning of class on Tuesdays or Thursdays. There are no make-up opportunities for missed Quizzes or tardy arrival. However, the two lowest Quizzes will be dropped from average grade computation, mainly to account for unavoidable class absence or tardiness.
- The Product Case Study is a team endeavor to produce a concise, well-organized video illustrating how a commercial product is manufactured. The assignment is to be conducted in small teams of 4 or 5 persons. More specific requirements are defined in documentation to be distributed separately.

University policy F69-24 at <http://www.sjsu.edu/senate/docs/F69-24.pdf> states that “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”

## Grading Policy

The course grade will be weighted as follows:

- 15% for Home works/Participation Tasks
- 15% for Quizzes
- 20% for Mid term
- 20% for Product Case Study
- 30% for Final Exam

The overall course grade is calculated from a weighted sum of all graded components. Graded percentage points correspond to letter grade as follows:

92.0-100 A | 89.9-91.9 A- | 87.0-89.8 B+ | 83.0-86.9 B | 79.9-82.9 B-  
77.0-79.8 C+ | 73.0-76.9 C | 69.9-72.9 C- | 67.0-69.8 D+ | 63.0-66.9 D | 59.9-62.9 D- | 0-59.8 F

Any work that is first evaluated by letter grade uses the following percentage values for computation:

A = 100, A- = 91.5, B+ = 89.5, B = 85, B- = 82.5,  
C+ = 79.5, C = 75, C- = 72.5, D+ = 69.5, D = 65, D- = 62.5, F = 0

Late Policy: Participation Tasks receive no credit when late. There are no make-up opportunities for missed Spot Checks/quizzes or late starts thereof.

Team Assignments and Peer Grading: Team assignments will be used for some portions of the course, and some assignments may involve peer grading. Alternative options will be considered for compelling reasons, but arrangements must be pre-approved in writing with ample time before corresponding deadlines (i.e. several days or even weeks in advance).

Exceptions: Any grading appeals must be petitioned promptly in writing (or via email). Appeals may be submitted promptly, and normally will be taken into consideration in context with all other exceptions class-wide. Most exceptions will normally be evaluated at the very end of the semester (i.e., near or possibly even after final exams). Special consideration for truly unavoidable and extenuating circumstances will depend on timing and strength of supporting documentation (e.g. doctor's note, jury summons, military orders).

According to University Policy F13-1 at <http://www.sjsu.edu/senate/docs/F13-1.pdf>, “All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades.”

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## University Policies

**“University Policies:** Office of Graduate and Undergraduate Programs **maintains university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc.”**  
You may find all syllabus related University Policies and resources information listed on GUP’s [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>

## Course Schedule

This schedule is subject to change with fair notice via announcement in class or notification via Canvas. Specific reading assignments and deadlines will be communicated in Canvas.

Lesson Topics	<u>Approximate</u> Timing of Graded Work ( <i>Exact deadlines set in Canvas</i> )
Case Study videos (online via Canvas) Case Study brainstorming and team formation	
Material properties and behavior Material properties and behavior	
<i>Labor Day holiday; no class meeting</i> Deformation processes (e.g., forging, rolling, bending)	
Deformation and shaping processes (e.g., extrusion) Cutting processes (e.g., shearing, drilling, turning)	Start Random Quizzes
Cutting processes (e.g., milling, broaching) Solidification processes: metal casting	
Solidification processes: polymer shaping Joining processes (fusion welding)	Product Case Study selection due
Joining processes (solid state, others) Non-mechanical machining	
Surface finishing & treatments Powder net shaping	Probable time for Midterm. Will be announced one week early
3-D layered manufacturing Microfabrication processes (e.g., lithography, etching)	
Microfabrication processes (e.g., vapor deposition) Statistical process control (variability, distributions)	<b>Product Case Study video due</b>
Statistical process control (control charts) GD&T introductory concepts and geometric features	Dr. John Lee Starts on GD&T
GD&T tolerance zones <i>Veteran's Day holiday; no class meeting</i>	
GD&T datums, and datum reference frames GD&T geometry control tools	
GD&T material condition GD&T feature control frames	
GD&T "built-in" controls GD&T bonus tolerance	
Course review and Final Exam preparation	

The Final Exam will be held on Thursday, Dec. 15th, 9:45 AM to 12:00 noon in our regular classroom.