Manufacturing Processes – ENGR 3350 - 001
Engineering
Fall 2016

A. COURSE INFORMATION
Course number/section: ENGR-3350_001
Class meeting time: LEC: 2:00 P.M. to 3:15 P.M. TR
Class location: LEC CI 108
Course Website: https://bb9.tamucc.edu/webapps/portal/frameset.jsp, then go
to the appropriate course section

B. INSTRUCTOR INFORMATION
Instructor: Ronald J. Carlson
Office location: EN 219
Office hours: M 8:00 to 10:00, W 8:00 to 9:00, F 10:00 to 12:00
Telephone: (361) 825-3272
e-mail: ronald.carlson@tamucc.edu
Appointments: email, call, or visit with instructor to make an
appointment

C. COURSE DESCRIPTION
Catalog Course Description
Introduction to metal and non-metallic manufacturing processes; casting, forging, rolling,
extrusion, sheet metal forming, cutting tools turning and milling operations, abrasive
machining, welding and joining powder compaction, molding, forming of plastics, surface
treatment, human factors and safety.

Extended Course Description
Students will be prepared to work in a manufacturing environment

D. PREREQUISITES AND COREQUISITES
Prerequisites
ENGR 1312 - Foundations of Engineering II, ENGR 3320 - Strength of Materials and
ENGR 2326 - Dynamics, SMTE-0095 – Safety Training
Corequisites
None

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES
Required Textbook(s)
Manufacturing Engineering and Technology, Seventh Edition by Serope Kalpakjian,
Steven R. Schmid
Optional Textbook(s) or Other References
Students will use online resources to supplement the text book.

Supplies
A calculator

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

1. To understand mechanical behavior, testing, and manufacturing properties of Materials
2. To learn about physical properties of materials
3. To learn about fundamentals of metal casting
4. To learn about rolling of metals
5. To learn about forging of metals
6. To learn about extrusion and drawing of metals
7. To understand fundamentals of machining
8. To learn about cutting-tools materials and cutting fluids
9. To learn about abrasive machining and finishing operation
10. To learn about fusion-welding processes

By the end of this course, students should be able to:

1. Calculate the forces involved and power required to machine a part.
2. Determine the surface finish, Ra number, of a part given the surface measurements.
3. Describe the Lost Foam Casting process
4. Fabricate an assembly to test the torque capability of an interference fit.
5. Perform a statistical process control analysis

INSTRUCTIONAL METHODS AND ACTIVITIES

Lecture with lab work. Lab work will consist of creating a foam mold that will be used in casing an Aluminum part to be used as a tensile test specimen. Learning to run a band saw, milling machine, lathe, and the tensile testing machine will also be part of the class work.

Students will work in teams during the labs and will design and conduct an experiment per the instructor’s directions.

MAJOR COURSE REQUIREMENTS AND GRADING
The comprehension of the material by the students will be measured by the following table.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams</td>
<td>20</td>
</tr>
<tr>
<td>Quizzes</td>
<td>5</td>
</tr>
<tr>
<td>Homework</td>
<td>20</td>
</tr>
<tr>
<td>Presentations</td>
<td>0</td>
</tr>
<tr>
<td>Lab Reports</td>
<td>30</td>
</tr>
<tr>
<td>Papers, Short Reports</td>
<td>5</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20</td>
</tr>
</tbody>
</table>

Grades will be assigned using the following scale:
A: 100-90, B: 89-80, C: 79-70, D: 69-60, and F: 59-0.

G. COURSE CONTENT/SCHEDULE

Homework will be as assigned. Last day to drop a class is November 11. Labs will be conducted to teach rudimentary machining skills. Holidays this semester are: Labor Day on September 9, Reading days November 22 and 23 and Thanksgiving November 24 and 25.

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/25</td>
<td>Expectations, Structure of Metals, and safety training</td>
<td>1</td>
<td>Read Chap.1</td>
</tr>
<tr>
<td>8/30</td>
<td>Machining, Cutting Tools, Gears</td>
<td>21, 22 &amp; 23</td>
<td>Read chap. 21, 22 &amp; 23</td>
</tr>
<tr>
<td>9/6</td>
<td>Mechanical Behavior and Testing of Materials</td>
<td>2, 3, 4 &amp; 5</td>
<td>Read chap. 2, 3, 4 &amp; 5</td>
</tr>
<tr>
<td>9/22</td>
<td>Exam 1, Start on Nonferrous Metals</td>
<td>6 &amp; 7</td>
<td>Read chap. 6 &amp; 7</td>
</tr>
<tr>
<td>9/27</td>
<td>Nonferrous Metals and Non-Metallic materials</td>
<td>8 &amp; 9</td>
<td>Read chap. 8 - 9</td>
</tr>
<tr>
<td>10/4</td>
<td>Metal casting</td>
<td>10, 11, 12</td>
<td>Read chap. 10 - 12</td>
</tr>
<tr>
<td>10/11</td>
<td>Forming and Shaping Processes</td>
<td>13 – 19</td>
<td>As assigned</td>
</tr>
<tr>
<td>10/25</td>
<td>Exam 2, Rapid Prototyping,</td>
<td>20 – 30</td>
<td>As assigned</td>
</tr>
<tr>
<td>11</td>
<td>Solid-State Welding to Product Design and Manufacturing</td>
<td>31- 40</td>
<td>As assigned</td>
</tr>
<tr>
<td>11</td>
<td>Statistical Process Control</td>
<td>36 - 40</td>
<td>As assigned</td>
</tr>
</tbody>
</table>
12/6 Last day of classes, review and topics of interest
December 8 Final Exam 1:45 P.M.

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

H. COURSE POLICIES

Attendance/Tardiness
Attendance will greatly benefit the student’s comprehension of the material. Tardiness is discouraged as it is disruptive and inconsiderate.

Late Work and Make-up Exams
Late work and make-up exams are at the discretion of the professor. Communicate the need for make-up work as quickly as is possible, preferably prior to class.

Extra Credit
There will be no extra credit.

Cell Phone Use
Cell phone use is prohibited during class time unless you have a family emergency. Cell phone may be used, with permission, during lab time. Students are encouraged to take pictures during labs to help document their work.

Laptop Use
Laptops may be used by students that purchased the text book as an ebook.

Food in Class
Food is not allowed in the class room.

Missed Exam
Missed exams may be made up at the professor’s discretion.

Participation
Participation is mandatory during the lab portion of the class. During the lecture portion, participation will help retain any information disseminated.

Others

I. COLLEGE AND UNIVERSITY POLICIES

- Academic Integrity (University)
  University students are expected to conduct themselves in accordance with the
highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of
days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage at [http://sci.tamucc.edu/students/GradeAppeal.html](http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

  [http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

- [Other important policies]

**J. OTHER INFORMATION**

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for
Instruction 350 or can be reached at (361) 825-3928.

GENERAL DISCLAIMER
I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.