Manufacturing Processes – ENGR 3350-001
Engineering
Spring 2018

A. COURSE INFORMATION

Course number/section: ENGR-3350_001
Class meeting time: LEC: 12:00 P.M. to 12:50 P.M. MW
Class location: EN 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: MW 2:00 to 3:00, MTW 5:00 to 6:00
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**

Engineering paper and 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 steps in 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

**G. INSTRUCTIONAL METHODS AND ACTIVITIES**
Lecture with lab work. Lab work will consist of creating a two part assembly using a milling machine, and lathe. Students will practice 3D solid modeling using Inventor to design parts for an assembly.

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

H. MAJOR COURSE REQUIREMENTS AND GRADING

Students will be evaluated on how well they participate in the lab work. As part of the lab grade, students will evaluate their team mates. Lab reports will be graded on technical content as well as presentation. Spelling and grammar are also considered. On problems, points will be deducted for incorrect answers, significant figures, not showing all of the work, including unit conversions, and not following the proper procedure.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams (2)</td>
<td>10 each</td>
</tr>
<tr>
<td>Quizzes</td>
<td>5</td>
</tr>
<tr>
<td>Homework</td>
<td>20</td>
</tr>
<tr>
<td>Lab Reports (2)</td>
<td>10 each</td>
</tr>
<tr>
<td>Tri-Weekly Reports (Total)</td>
<td>5 points</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30</td>
</tr>
<tr>
<td>Other activities . . .</td>
<td></td>
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</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.

I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 17</td>
<td>Machining Processes</td>
<td>21 to 24</td>
<td>Read chapters 21 to 24</td>
</tr>
<tr>
<td>Feb 5</td>
<td>Structure and Properties of Metals</td>
<td>Chapters 1, 2, and 3</td>
<td>Read chapters 1, 2, and 3</td>
</tr>
<tr>
<td>Feb 19</td>
<td>Machining Centers</td>
<td>25 and 26</td>
<td>Read chapters 25 &amp; 26</td>
</tr>
<tr>
<td>Feb 26</td>
<td>Exam 1 Metal Alloys</td>
<td>4 to 6</td>
<td>Read chapters 4 to 6</td>
</tr>
<tr>
<td>Mar 5</td>
<td>Non-Metals</td>
<td>7 to 9</td>
<td>Read chapters 7 to 9</td>
</tr>
<tr>
<td>Mar 26</td>
<td>Casting</td>
<td>10 to 12</td>
<td>Read chapters 10 -12</td>
</tr>
<tr>
<td>April 2</td>
<td>Exam 2 Forming</td>
<td>13 to 16</td>
<td>Read chapters 13 to</td>
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</tbody>
</table>
### Course Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Page</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 9</td>
<td>Powder Metallurgy</td>
<td>16</td>
<td>Read chapter 17</td>
</tr>
<tr>
<td></td>
<td>Additive Manufacturing</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Economics, Statistics, Special topics, welding, etc.</td>
<td>18, 19</td>
<td></td>
</tr>
<tr>
<td>TBA</td>
<td>Final Exam</td>
<td></td>
<td>As assigned</td>
</tr>
</tbody>
</table>

Note 1: 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.

### J. Course Policies

**Attendance/Tardiness**

Absences are discourage and detrimental to learning and to your grade. However, it is the student's responsibility to obtain class notes, handout materials, etc. when a scheduled lecture is missed. Grading for Attendance will be deducted after the first absence. Starting with the second absence a 1% deduction will apply. If you accumulate 6 absences you have a zero (half a letter grade) for this grading category Attendance/Tardiness.

**Late Work and Make-up Exams**

Late work, scheduled exam absences or No-show on lab/project will not be accepted unless there exists legitimate excuses (illness, death in the immediate family, etc.) and adequate documentation is furnished. If a make-up were to be needed it could be a degree higher in difficulty.

**Cell Phone Use**

Cell phone use is prohibited once class begins. They are to be silenced and put away where they are not seen. If a call is expected take it out of the class. Anyone that interrupts class due to cell phone will be asked to leave.

**Laptop Use**

Laptops may be permitted if used for class work with the instructor’s permission.

**Food in Class**

No food is permitted. Only bottled water with a cap or sealable lid is allowed. Failure to comply will result in the student being asked to leave to correct the issue.

**Missed Exam**

You will receive a zero for a missed exam, unless you have accommodations with Instructor or have a legitimate excuse. You are to communicate any issues immediately.

**Participation**

To be announced in class when extra points are given.
Others
No other policies at this time. Any changes will be announced in class.

K. 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)**
  I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. 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.
• 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.