Manufacturing Processes - ENGR 3350
Engineering
Spring 2015

A. COURSE INFORMATION
   Course number/section: ENTC 2402-001, ENTC 2402-201
   Class meeting time: 2:00 P.M. to 2:50 P.M. WF, 2:00 P.M. to 4:30 P.M. M
   Class location: Center for Sciences 103, Engineering 111 (subject to change)
   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: To be announced
   Telephone: (361) 825-3272
   e-mail: Ronald.carlson@tamucc.edu
   Appointments: email, call, or visit with instructor to make a appointment

C. 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.

   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

G. 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.
H. MAJOR COURSE REQUIREMENTS AND GRADING

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Exams</td>
<td>15</td>
</tr>
<tr>
<td>Quizzes</td>
<td>5</td>
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<tr>
<td>Homework</td>
<td>20</td>
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<tr>
<td>Presentations</td>
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<tr>
<td>Lab Reports</td>
<td>30</td>
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<tr>
<td>Papers</td>
<td>10</td>
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<tr>
<td>Final Exam</td>
<td>20</td>
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I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
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<tbody>
<tr>
<td>1/21</td>
<td>Structure of Metals</td>
<td>1</td>
<td>Reach chap.1</td>
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<tr>
<td>1/26</td>
<td>Mechanical Behavior and Testing of Materials</td>
<td>2 &amp; 3</td>
<td>Read chap. 2 &amp; 3</td>
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<td>2/2</td>
<td>Metal Alloys heat treatment, production, properties</td>
<td>4 &amp; 5</td>
<td>Read chapters 4 &amp; 5</td>
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<tr>
<td>2/9</td>
<td>Exam 1</td>
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<tr>
<td>2/16</td>
<td>Non-Metallic materials</td>
<td>7, 8, &amp; 9</td>
<td>Read chapters 7, 8, and 9</td>
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<tr>
<td>2/23</td>
<td>Metal casting processes, Cast Aluminum Lab</td>
<td>10, 11, &amp; 12</td>
<td>Read chapters 10, 11, and 12</td>
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<tr>
<td>3/9</td>
<td>Forming and Shaping Processes</td>
<td>13 to 20</td>
<td>As assigned</td>
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<td>3/16</td>
<td>Spring Break</td>
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<tr>
<td>4/6</td>
<td>Exam 2</td>
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<tr>
<td>4/13</td>
<td>Machining Processes</td>
<td>21 to 27</td>
<td>As assigned</td>
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<td>4/20</td>
<td>Student creative project</td>
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<tr>
<td>To be determined</td>
<td>Final Exam</td>
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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.

J. 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 may be extra credit on the exams. There will not be any extra credit for lab reports or homework.

Cell Phone Use
Cell phone use is prohibited during class time. Cell phone may be used, with permission, during lab time.

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

Food in Class
Food and drinks are not allowed in the class room.

Missed Exam
Missed exams may be made up at the professors discretion.

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

Others

K. COLLEGE AND UNIVERSITY POLICIES

- Academic Integrity (University)
  It is expected that university students will demonstrate a high level of maturity, self-direction, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior.
  See Full University Policy at http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity
• Classroom/Professional Behavior

• 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 by Friday, April 10, 2015. No student is eligible to receive a W without completing the official drop process by this deadline. Visit the Office of the University Registrar for the Course Drop Form that must be submitted. After April 10, 2015 a student will not be allowed 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, and the College of Science and Engineering Grade Appeals webpage at 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
Disability Services (DS) is the hub for coordinating services and accommodations to ensure accessibility and utilization of all programs for all Texas A&M University-Corpus Christi students with disabilities. Our services are designed to meet the unique educational needs of enrolled students with documented permanent or temporary disabilities. DS provides intake and consultation services to students seeking to register with our office. DS reviews an individual’s documentation of disability and assesses eligibility for services and the determination of reasonable accommodations. For more information visit the Disability Services Office at 116 Corpus Christi Hall or go to http://disabilityservices.tamucc.edu/

L. OTHER INFORMATION
Students will be working with and around machinery that is dangerous. A safety exam is required as is appropriate personnel protective equipment. Failure to comply will result in failing the class.
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.