A. **COURSE INFORMATION**

   Course number/section:  ENGR-3350_002  
   Class meeting time:  LEC: 9:00 A.M. to 9:50 A.M. WF  
   Class location:  LEC Center for Science 103  
   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**

   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  
   - 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>
</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>
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<tr>
<td>Presentations</td>
<td></td>
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<tr>
<td>Lab Reports</td>
<td>25</td>
</tr>
<tr>
<td>Papers, Short Reports</td>
<td>10</td>
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<tr>
<td>Final Exam</td>
<td>20</td>
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</tbody>
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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>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>Reach 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>
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<tr>
<td>9/6</td>
<td>Mechanical Behavior and Testing of Materials</td>
<td>2, 3, 4 &amp; 5</td>
<td>Read chapters 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>
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<tr>
<td>9/27</td>
<td>Nonferrous Metals and Non-Metallic materials</td>
<td>8, &amp; 9</td>
<td>Read chapters 8, and 9</td>
</tr>
<tr>
<td>10/4</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>10/11</td>
<td>Forming and Shaping Processes</td>
<td>13 to 20</td>
<td>As assigned</td>
</tr>
<tr>
<td>10/25</td>
<td>Exam 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Machining Processes</td>
<td>21 to 27</td>
<td>As assigned</td>
</tr>
<tr>
<td>11</td>
<td>Student creative project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/2</td>
<td>Last Class day</td>
<td></td>
<td>Review and topics of interest</td>
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</tbody>
</table>
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 unless you have a family emergency. 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 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

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**
  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.

• **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/](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/)

**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.