Course Syllabus

Department: Science & Technology

Date: 01-15-2013

I. Course Prefix and Number: TECH 101

   Course Name: Materials and Processes I

   Credit Hours and Contact Hours: 3 credit hours and 4 contact hours

   Catalog Description including pre- and co-requisites: supporting data required for grade prerequisite of ‘C’ or higher. A first course in materials and processes. A general introduction to engineering materials and modern processes. Topics include mechanical, physical, and chemical properties of ferrous and non-ferrous metals and processes such as machining, casting, forming, powder metallurgy, and welding.

   Pre-requisite: None.

   Relationship to Academic Programs and Curriculum including SUNY Gen Ed designation if applicable:
   This course is primarily a required course for the A.A.S. in Mechanical Technology program. Other students from other programs may also take the course if they have the appropriate background.

II. Course Student Learning Outcomes: State the student learning outcome(s) for the course (e.g. Student will be able to identify…)

   Upon completion of the course the student will be able to:

   1. Classify the various ferrous and non-ferrous metals
   2. Discuss the properties of ferrous and non-ferrous metals
   3. Identify the various processes used to form ferrous and non-ferrous metals
   4. Use basic length measuring instruments
   5. Use a machine lathe and mill to cut metals
   6. Specify thread size and cut internal / external threads

   College Learning Outcomes Addressed by the Course: (check each College Learning Outcome addressed by the Student Learning Outcomes)

   ☑️ writing  ☐ computer literacy
   ☐ oral communications  ☐ ethics/values
   ☑️ reading  ☐ citizenship
   ☐ mathematics  ☑️ global concerns
   ☐ critical thinking  ☐ information resources

III. Assessment Measures (Summarize how the college and student learning outcomes
will be assessed): For each identified outcome checked, please provide the specific assessment measure.

<table>
<thead>
<tr>
<th>List identified College Learning Outcomes(s)</th>
<th>Specific assessment measure(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>eg: writing</td>
<td>eg: student will complete a research paper</td>
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<tr>
<td>Writing</td>
<td>Student will complete a set of lab reports</td>
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<tr>
<td>Reading</td>
<td>Student will answer specific test questions correctly</td>
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<tr>
<td>Global Concerns</td>
<td>Student will complete a series of papers</td>
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IV. Instructional Materials and Methods

Types of Course Materials:
No textbook is required for this course. Instructor notes are the main source of information for the course content.
A course website is maintained on the internet for lecture power points, course calendar, and other course related material.

Methods of Instruction (e.g. Lecture, Lab, Seminar …):
Mainly lectures are used to convey the knowledge to the student using power point presentations, supplemented with models and material samples.
Weekly lab sessions are used to reinforce the theory taught in the classroom by allowing the students to carry out hands-on activities with machine tools.
Field trips are taken when feasible and time permitting to see actual equipment in operation.

V. General Outline of Topics Covered:
An overview of materials and processes
The nature of materials
Mechanical properties of metals
Physical properties of metals
Chemical properties of metals
Metal corrosion
Ferrous metals
Non-ferrous metals
Heat treatment of metals
Fundamentals of metal casting
Metal forming
Powder metallurgy
Welding
Basic measuring and layout instruments
Vernier caliper and micrometer
Precision gage blocks and sine bar
Theory of metal machining
Machining metal on a lathe
Machining metal on a mill
Thread cutting

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