STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
MECH 221 – ENGINEERING MATERIALS LABORATORY

Created by: Cullen Haskins

Updated by: Canino School of Engineering Technology

Department: MECHANICAL ENGINEERING TECHNOLOGY

Semester/Year: FALL 2018
A. **TITLE:** ENGINEERING MATERIALS LABORATORY

B. **COURSE NUMBER:** MECH 221

C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

   # Credit Hours: 1
   # Lecture Hours: per week
   # Lab Hours: (1) two-hour per week
   Other: per week

   Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE:** Yes ☒ No ☐

E. **GER CATEGORY:** None: ☐ Yes: GER
   If course satisfies more than one: GER

F. **SEMESTER(S) OFFERED:** Fall ☒ Spring ☐ Fall & Spring ☐

G. **COURSE DESCRIPTION:**

   This course provides hands on experimentation in materials testing as it relates to material properties for ferrous and nonferrous metals, concrete, plastics and wood. Technical report writing that meets industrial accepted standards is required.

H. **PRE-REQUISITES:** None ☐ Yes ☒ If yes, list below:

    ENGS 101, or permission of instructor

   **CO-REQUISITES:** None ☐ Yes ☐ If yes, list below:
I. **STUDENT LEARNING OUTCOMES:** *(see key below)*

By the end of this course, the student will be able to:

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<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>Program Student Learning Outcome [PSLO]</th>
<th>GER [If Applicable]</th>
<th>ISLO &amp; SUBSETS</th>
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<tbody>
<tr>
<td>A. Collect, organize, and report data using spreadsheet software for data analysis</td>
<td>PENDING ABET OUTCOME UPDATE</td>
<td>1-Comm Skills 2-Crit Think 5-Ind, Prof, Disc, Know Skills</td>
<td>W PS Subsets Subsets</td>
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<td>B. Write technical reports that meet accepted industry practice</td>
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<td>1-Comm Skills 2-Crit Think 5-Ind, Prof, Disc, Know Skills</td>
<td>W PS Subsets Subsets</td>
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<td>C. Conduct material testing to ASTM standards and verify theoretical equations</td>
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<td>1-Comm Skills 2-Crit Think 5-Ind, Prof, Disc, Know Skills</td>
<td>W PS Subsets Subsets</td>
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<td>D. Build team working skills and explain technical data in oral presentations</td>
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<td>Critical Thinking</td>
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<td>Critical Analysis [CA], Inquiry &amp; Analysis [IA], Problem Solving [PS]</td>
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<td>Foundational Skills</td>
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<td>Information Management [IM], Quantitative Lit./Reasoning [QTR]</td>
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<td>Social Responsibility</td>
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<td>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</td>
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<td>5</td>
<td>Industry, Professional, Discipline Specific Knowledge and Skills</td>
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*Include program objectives if applicable. Please consult with Program Coordinator*
J. **APPLIED LEARNING COMPONENT:** Yes ☒ No ☐

If YES, select one or more of the following categories:

- Classroom/Lab ☒
- Internship ☐
- Clinical Placement ☐
- Practicum ☐
- Service Learning ☐
- Community Service ☐
- Civic Engagement ☐
- Creative Works/Senior Project ☐
- Research ☐
- Entrepreneurship ☐
- (program, class, project)

K. **TEXTS:**

None

L. **REFERENCES:**

None

M. **EQUIPMENT:** None ☐ Needed: Materials Testing Lab (Nevaldine South 110)

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

Class/team participation
Experimentation and test setup
Oral presentation
Technical written reports related to experimental data

P. **DETAILED COURSE OUTLINE:**

N/A

Q. **LABORATORY OUTLINE:** None ☐ Yes ☒

I. Library Research on ASTM standards
II. Hardness Test (Brinell, Rockwell B, C), and tensile strength prediction
III. Tensile Test of Steel (hot rolled vs. cold rolled)
IV. Tensile Test of Aluminum (2011-T4 vs. 6061-T6)
V. Tensile Test of Cast Iron
VI. Tensile Test Plastics
VII. Compressive Test Concrete
VIII. Shear Test (direct and torsional) (steel vs. aluminum)
IX. Impact Test
X. Cold working aluminum
XI. Hardenability Test (Jominy End-Quench 1018, 1095, 4140)
XII. Heat treatment of tool steel
XIII. Metallography
XIV. 3 point / 4 point bend test on brittle material
XV. Compression test on wood
XVI. Bend test of wood