COURSE CALENDAR DESCRIPTION

The ever-expanding range of scale in manufacturing presents unique challenges for engineers and manufacturers. This course will introduce students to the traditional macro-manufacturing methods and existing micro-manufacturing methods. Macro-manufacturing methods may include casting, forming and forging, machining (e.g. CNC and EDM), injection molding, additive manufacturing, treatments (heat, shot pinning, etc.). Micro-manufacturing methods will include those based on silicon, thin film and polymer technologies; Current trends and issues will be explored during selected field trips, laboratory visits, and/or through in-class activities. Prerequisites: LE/MECH 2412 3.00.

INSTRUCTOR(S)

<table>
<thead>
<tr>
<th>Name</th>
<th>Section / Format / Term</th>
<th>Contact Email</th>
<th>Contact Phone</th>
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<tbody>
<tr>
<td>Sachlos, Eleftherios Terry</td>
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TOPICS AND CONCEPTS

Topics
- General Introduction
- Introduction to Manufacturing; Fundamentals of Engineering Materials
- Metal Casting
- Metal Forming & Working
- Powder Metallurgy & Processing of Ceramics
- Polymer Processing
- Rubber & Polymer Matrix Composites
- Non-Traditional Machining
- Rapid Prototyping and Additive Manufacturing
- Microfabrication and Nanofabrication Technologies
- Surface Processing Operations

LIST OF LEARNING OUTCOMES AND EXAMPLES OF

Course Learning Outcomes

Upon the completion of this course, students are expected to learn and retain the following concepts and skills:

1. Identify appropriate materials and manufacturing process(es) to manufacture given product(s).
2. Use general design guidelines to analyze the manufacturability of parts and/or components being made by given material(s) and process(es).
3. Recognize different metal processing technologies and/or treatments as well as their effects on the structure and properties of them.
4. Recognize different polymer-based material systems’ processing technologies and their effects on the structure and properties of these material systems.
5. Identify appropriate micro-manufacturing or fabrication technologies to manufacture given products with micro-features.

**GRADED ASSESSMENT**

**Proposed Percentage Breakdown**
1. Participation: 10%
2. Team Manufacturing Presentation (group): 15%
3. Future Manufacturing Report (individual report): 15%
4. Midterm: 20%
5. Final Examination: 40%

**ADDITIONAL INFORMATION**

**Required Textbook**
*Introduction to Manufacturing Processes* by Mikell P. Groover

**ACADEMIC INTEGRITY LINKS**
- Senate Policy on Academic Honesty - http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/
- Academic Integrity - http://lassonde.yorku.ca/academic-integrity

**STUDENT LINKS**
- Student Rights and Responsibilities - http://oscr.students.uit.yorku.ca/student-conduct
- Religious Observance - https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs
- Counselling and Disability Services - http://cds.info.yorku.ca/

Many courses utilize Moodle, York University’s course website system. If your course is using Moodle, click here to access it.

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