EXPANDED COURSE DESCRIPTION
MECHANICAL ENGINEERING
Lassonde School of Engineering
Mechanical Engineering
LE / MECH 3503 3.0 SECTION M
MACRO-AND-MICRO MANUFACTURING METHODS
FALL 2019 / WINTER 2020

Last Modified Date: 08/12/2019

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 peening, 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. Prerequisite: 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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</thead>
<tbody>
<tr>
<td>Sachlos, Eleftherios</td>
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ADDITIONAL INFORMATION

COURSE TOPICS
- 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

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.
GRADING SCHEME

Participation: 10%
Team Manufacturing Presentation (group): 15%
Future Manufacturing Report (individual): 15%
Midterm Examination: 20%
Final Examination: 40%

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
- Student Accessibility Services (SAS) - https://accessibility.students.yorku.ca/
- York University’s Policies on Gender/LGBTQ*/Positive Space - http://rights.info.yorku.ca/lgbtq/

LAND ACKNOWLEDGEMENT

- We acknowledge our presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, the Huron-Wendet, and the Métis. It is now home to many Indigenous Peoples. We acknowledge the current treaty holders, the Mississaugas of the New Credit First Nation. This territory is subject of the Dish With One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.
- The Indigenous Framework for York University: A Guide to Action can be found here: http://indigenous.info.yorku.ca/
- Meaning of a land acknowledgement: http://healthydebate.ca/opinions/indigenous-land-acknowledgements

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