COURSE CALENDAR DESCRIPTION

Introduction to contemporary themes in bioengineering including: biological concepts for engineers; cell and tissue engineering; regenerative medicine and stem cells, bionanotechnology, biomaterials, drug screening, bioreactors, biotechnology, bioinformatics, genetic engineering, clinical trials and regulations. Prerequisite: 21 3000-level science or engineering credits including LE/MECH 3503 3.00

This course takes a multidisciplinary approach in conveying contemporary themes in bioengineering. A fundamental introduction into basic concepts in cell and molecular biology is reinforced by the bioengineering applications of each theme. Students develop a robust understanding of the underlying science, research frontier, and industry applications in each theme. Lecture content will be complemented with several expert guest speakers discussing recent research advances. A strong emphasis on up to date research findings from the scientific literature will be foundational for each theme.

INSTRUCTOR(S)

<table>
<thead>
<tr>
<th>Name</th>
<th>Section / Format / Term</th>
<th>Contact Email</th>
<th>Contact Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sachlos, Eleftherios</td>
<td>Sec. M / LECT / W</td>
<td><a href="mailto:terry.sachlos@lassonde.yorku.ca">terry.sachlos@lassonde.yorku.ca</a></td>
<td>York Ext. 44685</td>
</tr>
</tbody>
</table>

ADDITIONAL INFORMATION

TOPICS AND CONCEPTS
1. Biological Concepts for non-biologists
2. Cell and Tissue Engineering
3. Regenerative Medicine and Stem Cells
4. Biomaterials and Bio-nanotechnology
5. Cancer, disease and drug delivery
6. Imaging systems & Probes
7. Midterm
8. Implantable medical devices
9. Drug Screening & Bioinformatics
10. Biotechnology & Bioreactors
11. Genetic Engineering and Synthetic Biology
12. Navigating regulations in pre-clinical & clinical trials
13. Review & Presentations on Opportunities in Bioengineering

COURSE LEARNING OUTCOMES
1. Demonstrate understanding of broad concepts in several bioengineering themes
2. Apply physical, chemical and biological principles to analyze bioengineering-based systems
3. Proficient in biological concepts relevant to bioengineering
4. Identify applications where pioneering bioengineering research and technology would have potential impact on economic, health and safety risks
5. Demonstrate competency in applying critical review skills to identify strengths and weaknesses of scientific papers

**COURSE EVALUATION**

- 30% Assignments on reviewing scientific publications
- 15% Midterm exam
- 20% Presentation on Opportunities in Bioengineering
- 35% Final Exam or Final Report

**ACADEMIC INTEGRITY LINKS**

- Senate Policy on Academic Honesty - [http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/](http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/)
- Academic Integrity - [http://lassonde.yorku.ca/academic-integrity](http://lassonde.yorku.ca/academic-integrity)

**STUDENT LINKS**

- Student Rights and Responsibilities - [http://oscr.students.uit.yorku.ca/student-conduct](http://oscr.students.uit.yorku.ca/student-conduct)
- Religious Observance - [https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs](https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs)
- Student Accessibility Services (SAS) - [https://accessibility.students.yorku.ca/](https://accessibility.students.yorku.ca/)
- York University’s Policies on Gender/LGBTQ*/Positive Space - [http://rights.info.yorku.ca/lgbtq/](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-Wendat, 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.

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

Moodle @ York University