About the Instructors

INSTRUCTOR | Dr. Johan Foster
NSERC Canfor Industrial Research Chair in Advanced Bioproducts
Chemical and Biological Engineering
Office: CHBE 421 and PPC 323
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Johan's short bio: Born in BC, spent 3 years in the Netherlands, 5 years in Switzerland, 5.5 years in Virginia. Just back to BC in time for COVID-19. Like: skiing, biking, hiking, travel (or I used to...).
For more research and group information see:
https://foster.chbe.ubc.ca

INSTRUCTOR | Dr. Orlando Rojas
Canada Excellence Research Chair (CERC) and Director of the Bioproducts Institute, Chemical and Biological Engineering, Chemistry and Wood Science.
Office: CHBE Rm. 259, 2360 East Mall
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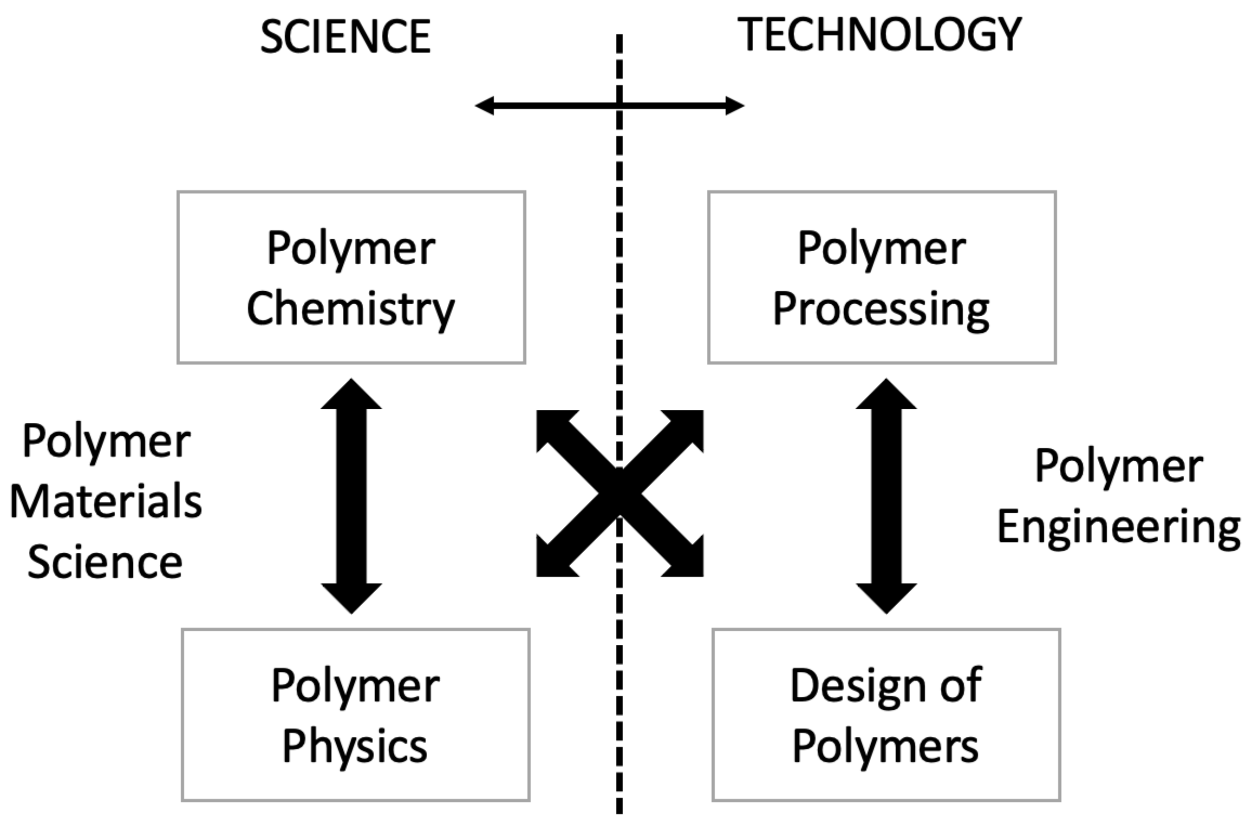
Orlando's short bio: Born in Venezuela, spent 20 years in the Spain (Barcelona), USA (Alabama in NC), Sweden (Stockholm) and Finland (Helsinki). Like: Hiking, swimming (water polo)
For more info about his research and group information see:
https://rojas.chbe.ubc.ca/

Overview - New



Grading

- 25-30% Midterm 1
- 25-30% Midterm 2
- 5-10% In class quizzes
- 40% Final Exam

Learning Goals

Where Are We Going?

By mastering the content of this course, students will be able to

- Develop a basic understanding and appreciation of polymers and polymer-based composites
- Analyze and evaluate polymers in both solid and melt state
- Speak the language of polymer materials
- Recognize the key variables, which determine and control the performance of polymers in significant applications such as packaging, and transportation.
- Understand the relationship between processing, structure and rheological properties
- Become familiar with the terminology, literature, and current research thrusts of the polymer community.

Recommended Resources

No Textbook Required for Course!

Suggested reference books:

- Principles of Polymer Processing, 2nd ed. Z. Tadmor and C. G. Gogos, Wiley, NY (2006).
- Polymer Processing: Principles and Design, D. G. Baird and D. I. Collias, Wiley, NY (2014). Available on-line via UBC Libraries.
- Other readings will be assigned as necessary

Course Outline (roughly)

This might change as the semester progresses! Hopefully we will have in guest lecturers, and the units might change accordingly.

Unit 1 – Basic Definitions & Concepts / Molecular Weight Determination

Unit 2 – Polymer chemistry and solution rheology

Unit 3 – Solid state (amorphous and crystalline): Polymer characterization techniques (mechanical properties)

Unit 4 – Melt state: Understand polymer dynamics (rheological properties)

Unit 5 – Polymer processing via die forming (extrusion)

Unit 6 – Mixing (thermodynamics of polymer blends), injection molding and thermoforming

Unit 7 – Polymer processing and membranes

Unit 8 – Processing of polymer fibers

Unit 9 – Use and processing of adhesives

Unit 10 – Polymer recycling and sustainability