Applied and Industrial Mathematics
Undergraduate thesis topics for Fall 2017–Winter 2018

March 29, 2017
C. Sean Bohun (possible topics: 1 of 2)

- Predicting and prescribing distortion of thin glass sheets.
- Investigate complex chemical processes. Examples include: the carbonate system, responsible for ocean acidification; the Acheson process, responsible for commercial production of silicon carbide.
- Tissue engineering: the optimal placement of cells using magnetic micro-beads.
Modelling processes that characterize unknown samples to increase their current capabilities. Examples include: rotating disk apparatus, high resolution melt analysis and cyclic voltammetry.

Develop mathematical tools to help design high power tuneable lasers.

Model biological processes. Examples include: brain vascular systems and bone remodelling.
Mehran Ebrahimi (possible topics)

- Medical image registration
- Medical image segmentation
- Medical image fusion
Greg Lewis (possible topics)

- Transitions in atmospheric flow patterns
- Mathematical models for electro-location in weakly electric fish
- Mathematical aspects of MRI
Lennaert van Veen (possible topics)

- Phase transition in interface formation. Will include elements of: theory of interface formation, stochastic partial differential equations, numerical methods, data analysis.

- Bifurcations in a strained food chain model. Will include elements of: population dynamics, numerical bifurcation analysis, normal form analysis.