

Zhengchu Tan

Personal Statement

An enthusiastic, driven tutor with strong work ethic, determination and passion for teaching and learning; with the ability to communicate clearly and concisely to define novel concepts and reinforce existing knowledge of students.

Education

2015-2019 Imperial College London

Doctor of Philosophy (PhD), Mechanical Engineering.

Research Title: Numerical and Experimental Fracture Mechanic Approach to Needle Insertion Crack Growth of Soft Tissue

The focus of this project is the development of a composite hydrogel (CH) constituting of poly(vinyl) alcohol (PVA) and phytigel that is able to match the complex viscoelastic behaviour of brain. Cell viability of the CH substrate is also investigated, therefore extending the research to include mechanobiology and regenerative medicine studies.

2011-2015 Imperial College London

Master of Engineering, Mechanical with Nuclear Engineering, **1st Class Honours.**

Fourth Year:

Modules:

- Mathematics
- Nuclear Thermal Hydraulics
- Nuclear Materials
- Advanced Aircraft Technology
- Nuclear Reactor Physics
- Business Economics

Project: Simulation of Needle Insertions with Novel Motion Profiles

To understand the mechanisms of tissue damage upon needle insertion and to find an effective insertion method that minimises the damage by simulating the insertion processes using a 3D finite element model, in which the constitutive relationships of agar gel and gelatine used to mimic real tissue will be investigated through experiments.

Third Year:

Modules:

- Stress Analysis
- Finite Element Analysis
- Machine Systems Dynamics
- Thermodynamics and Energy

Project 1: A Novel Surgical Robotic Tool

This research was conducted during a 10 week placement at the National University of Singapore (NUS) as part of an International Summer Research Exchange between Imperial College and NUS, in which the deformation characteristics of a segmented robotic manipulator surgical arm under static and dynamic loading conditions were investigated using a finite element model that involved contact issues between multiple surfaces.

First and Second Year:

Modules:

- Mathematics
- Mechatronics
- Solid Mechanics
- Thermofluids

2004-2011 King Edward VI Camp Hill School for Girls

A-Levels:

- | | | | |
|-----------------------|----|-----------------|---|
| - Maths | A* | - Further Maths | A |
| - Physics | A* | - Chemistry | B |
| - Fine Art (AS-Level) | A | | |

GCSE's: 9 A*'s, 4 A's

Tuition History

09.2013 - Present GCSE to A-level Student in Mathematics and Sciences

Strengthening a student's academic ability in mathematics, physics, chemistry and biology from year 9 to currently year 12 on GCSE and A-level curriculum.

02.2017 Imperial College London Interview

Provided preparation material for a candidate interviewing for an undergraduate course at Imperial College London. Reviewed student's personal statement and worked through specialised technical questions together.

Key Skills

Technical Skills:

Strong problem solving skills based on solid first principle knowledge in Mechanical Engineering. Proficient in using Microsoft Office suite and the following engineering design, analysis and simulation software:

- | | |
|------------------------|-------------------|
| - MATLAB R2016a | - SolidWorks 2016 |
| - ANSYS Workbench 15.0 | - ABAQUS 6.14 |
| - LabVIEW | - ImageJ |

Languages:

- | | |
|---------------------------|-----------------------------|
| - English (Native) | - Mandarin Chinese (Fluent) |
| - Japanese (Intermediate) | |

Experiences

10.2014 - Present Rector's Ambassador

Representing Imperial College London during open days and official events for international visitors and building relationships with professionals and academics from across the world.

06.2012 - Present Royal Institution Volunteer

Teaching children the basics of science and technology at Family Fun Day events held by the Royal Institution.

Personal Interests

IMechE and Royal Institution lectures; Classical Music - playing the violin (grade 8) in orchestras.

References

References are available upon request.