

Known Side Effects of Biomedical Engineering



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Exceptional People. Exceptional Care.



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

School and Early Life



- Always liked to play with (read break) electronics
 - Parents could not have nice things!
 - Built my own electric go cart... Needed an extension cord
- Always afraid of doctors and medicine
 - Quite sick as a child
- High school – Iona College Lindum
 - Math, Chem and Phys Nerd
 - Also did Graphics and IPT
 - Didn't like one enough to carry it to Uni
 - Many are probably feeling the same
 - Thought engineering might combine a few

University



- Engineering combined all the things I liked
 - Not to sure what flavour engineer to be
 - General Plan
- How did Biomed get into all this?
 - Blame Dr. Wilson
 - Electronics and Biology sounded pretty cool!
 - Double Major in Elec and Biom was introduced in 2006

Some Advice

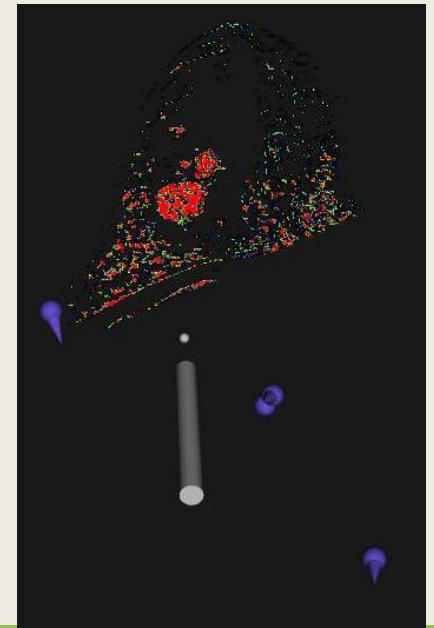
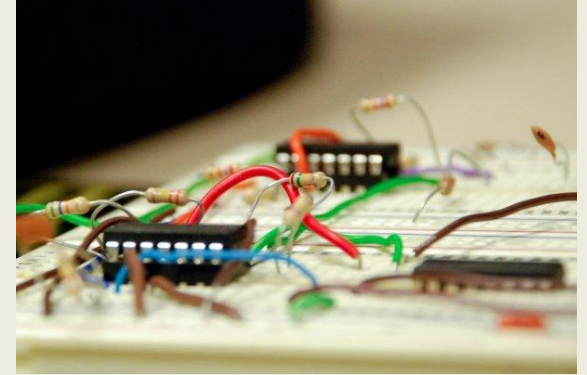


- **Do a double major!**
 - 2 Degrees for the price of one (if you don't fail/repeat)
 - Many courses are relevant in both Electrical and Biomed
 - Interesting diversity in your course work
 - Taste of medicine while still in your engineering comfort zone
- **Don't be put off by the biology**
 - You will pick it up easy
 - If you can do Math C, you can handle bio at uni

What will the degree do to you?



- A thorough basis in electronics
 - Instrumentation courses give you experience in analogue and digital diagnostic tools.
 - 3rd year design course has you building EGC's and writing software for heart rate detection
- An understanding of medical imaging
 - Several imaging courses take you through multiple modalities from MRI- to Ultrasound.



How to Learn



- **The Big one: How to learn!**
 - Lots of courses have some relevant info and “less” relevant info
 - The biggest skill you can have as an engineer is learning and then applying knowledge quickly.
 - As a biomed, your job is to take the knowledge from traditional form of engineering and combine it with biology to solve problems no one else can.

Teamwork



- The Bigger one: Teamwork
 - UQ puts all engineers through 2 team design projects
 - Work with engineers of different backgrounds and disciplines
 - This was my favourite course
 - Forces you to develop good strategies for:
 - ✦ Project management
 - ✦ Intra-team communication
 - ✦ Documentation of work done
 - ✦ Conflict resolution
 - ✦ And surviving extended hours without sleep



Of course sometimes you need sleep



An Actual Day in the Life



- Currently I am a Biomedical Technician at the Mater
- What does that mean?
 - We are responsible for:
 - ✦ Planned maintenance
 - ✦ Service and repairs
 - ✦ Emergency repairs
 - ✦ Equipment installation & modification
- Very enjoyable hands on work
- Work in a clinical environment
- Punctuated emergency call-outs

Everyday Skills



- Teamwork and conflict resolution:
 - We deal with:
 - ✦ Doctors
 - ✦ Nurses
 - ✦ Clinical Technicians
 - ✦ Researchers
 - They all have different ideas on the definitions of important and urgent!
 - Different to working with like minded engineers in an office

Everyday Skills



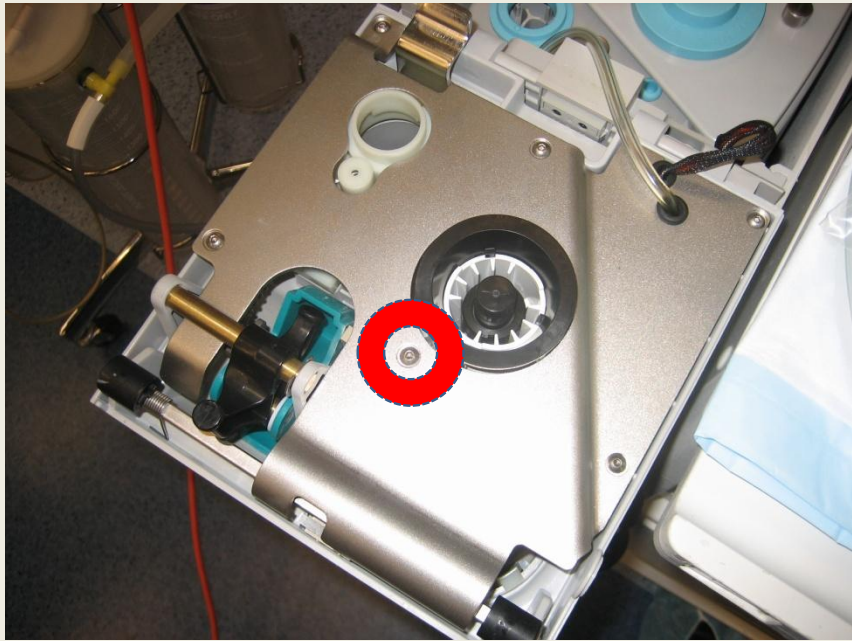
- Good knowledge of electronics and medical equipment
 - Day to day you play with everything from infusion pumps to bladder scanners
 - Good problem solving and analytical skills to figure out if there is an error and how to fix it
 - Difficult to have an encyclopaedic knowledge of every machine so you need that ability to learn fast and apply
- Head for safety
 - You will sometimes be in a more dangerous environment than a lab
 - Have to be sure that the repair/service has left the equipment safe for patient use
 - Electrical safety for cardiac and body floating devices

Emergencies



- The ability to use all your other skills quickly and with a level head
- Emergency responses are a lot of fun (and stress)
- They do require the ability to prioritise
 - Everybody thinks their problem is an emergency
- My favourite emergency story





Boring Skills



- Those photos are the result of writing up an incident report
- Documenting work done, while tedious is one of the most important tasks
 - Considering most other power engineers just fly a spreadsheet we are lucky
- Hardest thing for me was the idea of safety first
 1. Entertainment value
 2. Profit
 3. Safety

The Future



- Biomedical engineering is a growth industry
- There are numerous service and research jobs out there
- Also plenty of opportunity to stay at uni for a higher degree
- And there is no reason you can't be involved in both
- Currently there are slightly more opportunities overseas than at home... But that's slowly changing
- No need to feel tied down
- If you play your degree right, you still have all the opportunities of an electrical engineer

Thanks



SEE YOU AT LUNCH