Program Report

NCKU Biodesign Summer Course 2026

29 June 2026 – 24 July 2026

1. Introduction

I recently had the valuable opportunity to participate in the NCKU Biodesign Summer Course 2026. This 4-week immersive program was held from June 29 to July 24, 2026, at the SPICE HARBOR facility in National Cheng Kung University (NCKU), located in Tainan, Taiwan. The primary goal of the program was to bridge the gap between unmet clinical needs, medical innovation, and real-world implementation. It was a great platform that brought together international students to explore the entire process of developing practical medical device solutions.



2. Core Learning Phases

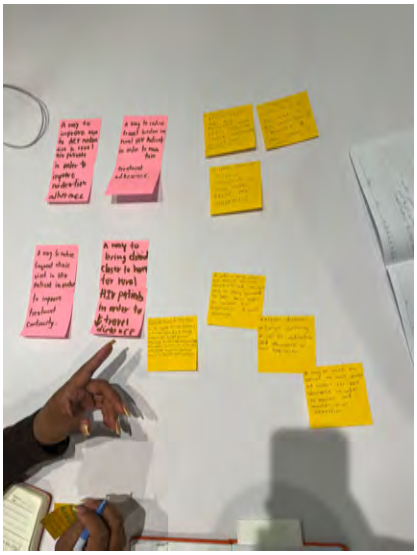
Throughout the four weeks, the curriculum was carefully structured to take us step-by-step through the medical innovation journey:

Identifying Needs and Design Thinking (Week 1): The foundation of any good medical device is a real problem. During the first week, we focused heavily on clinical need identification and feasibility analysis. We learned how to apply "Design Thinking" to medical device development

and conducted competitive analysis to ensure our ideas were unique. We also had brainstorming sessions to converge on the best medical device solutions.

From Concept to Prototype (Prototyping & Design): Once we had our ideas, we moved into the practical phase. We attended sessions on how to transform an idea from a prototype to a final product . Through hands-on prototype fabrication and rapid prototyping workshops, our team was able to start building our medical device concepts. We also learned how to define a Target Product Profile (TPP) to clearly outline our product's goals.





Artificial Intelligence (AI) and Smart Healthcare: A very exciting part of the course was seeing how modern technology is reshaping hospitals. We had in-depth lectures on AI applications in healthcare, specifically focusing on medical record summarization, medical signal processing, and medical imaging [cite: 1]. The professors also taught us about building biomedical databases, such as those for Cancer and Kawasaki Disease. Additionally, we explored wearable medical devices, ultrasound imaging, and the use of Virtual Reality (VR) in healthcare applications.

Preventive Medicine and Chronic Disease Management: The course did not just focus on treating illnesses, but also preventing them. We attended special preventive medicine lectures covering a wide range of topics, including obesity management, HIV/AIDS prevention, and dietary nutrition [cite: 1]. We also discussed the screening and treatment of diabetic peripheral neuropathy [cite: 1].

3. Business Skills, Regulations, and Startup Insights

To successfully bring a medical device to the market, engineering is not enough. We received a global medical device regulatory overview and learned about medical device patent practices from industry experts. We also gained startup insights by listening to experience sharing from companies like MedVision and Yi-En Medical Research. Importantly, we were trained on "Pitch Design," learning how to present our ideas effectively to potential investors.

4. Real-World Field Visits (Industry & Clinical)

To understand the actual working environments and user needs, the program arranged several excellent field visits:

Elderly and Patient Care: We visited a Day Care Center and a Long-Term Care Facility, where we even discussed the interesting topic: "Are We Ready When Robots Enter the Ward?".

Rehabilitation and Fitness: We toured the Smart Assistive Technology Center and the All-Age Smart Exercise Center to observe healthy aging equipment.

Industry and Training: We went to the Clinical Skills Center to see how doctors are trained, and visited SportsArt Industrial Co. and a Home Care Technology Living Lab to see commercial healthcare operations in action.

