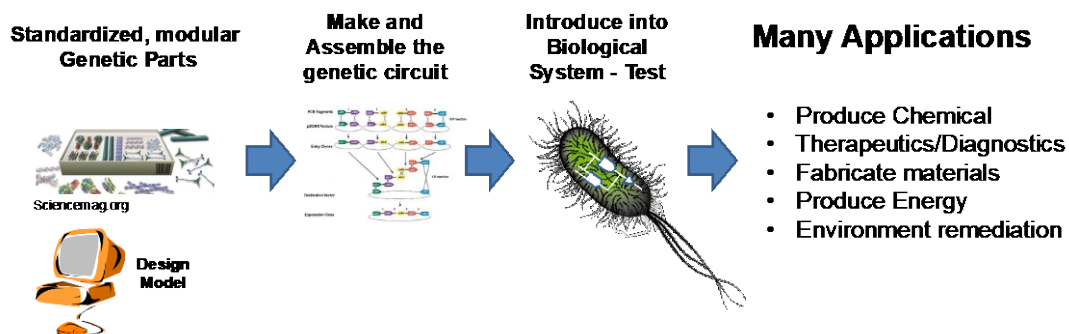


BN4501 ENGINEERING BIOLOGY

WHAT IS THIS MODULE ABOUT?

This module introduces students to Engineering Biology/Synthetic Biology, an exciting field in which living cells are designed and modified using engineering principles for biomedical and industrial applications, from [living therapeutics](#) to cell factories that produce high value bioproducts such as [spider silk proteins](#) in a sustainable manner. In this module, you will learn the key engineering concepts in designing synthetic gene circuits to program biological systems with useful functions, analogous to how we program electronic devices. You will also be taught how to apply modelling techniques to studying the gene circuits performance *in silico* and learn about the enabling technologies including DNA sequencing and synthesis, and gene assembly/editing. Finally, you will apply what you will learn to present interesting projects from [iGEM](#), the premier international students' competition in synthetic biology! This module will be taught by A/P POH Chueh Loo (poh.chuehloo@nus.edu.sg).

Synthetic Biology The Engineering of Biology



WHY YOU SHOULD CONSIDER THIS MODULE

Engineering biology is a rapidly developing field, driving the Bio-Revolution¹ and is about to disrupt the industry². “Synthetic biology technologies are finally maturing, becoming the way almost anything can be manufactured competitively and sustainably.” - a quote from the BCG report². The many industries synthetic biology is impacting include Healthcare, Industrial Chemicals, Food, and DNA and RNA Synthesis ([CBInsights](#)). There is also growing number of successful startups in this area, including well-known companies such as Ginkgo Bioworks, Moderna, and Impossible Foods. As such, new skills in the field of synthetic biology which you will learn in this module will be in increasingly high demand. (¹Report by [McKinsey Global Institute](#) ; ²Report by [Boston Consulting Group](#))



NUS
National University
of Singapore

College of Design and Engineering

Department of Biomedical Engineering