



# CHE656 AIChE NSDC Problems

Semester 2, 2023, Part (a)

## Problem Statement

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### Introduction

Chemical Engineering Practice School (ChEPS) is a practice-based Master's program in chemical engineering at King Mongkut's University of Technology Thonburi (KMUTT) in Bangkok, Thailand. ChEPS was established in 1998 as a flagship international curriculum modeled after David H. Koch School of Chemical Engineering Practice at Massachusetts Institute of Technology (MIT) in Cambridge, USA. The ChEPS curriculum comprises two years. The mission of ChEPS is twofold. One is to introduce Western-style education, which tends to focus on critical thinking and problem-solving, into classroom at the graduate level. Because a conventional curriculum usually emphasizes only technical contents, the second goal of ChEPS is to produce well-rounded chemical engineering graduates who are well-versed in both technical and soft skills. Soft skills are personal attributes that are outside one's professional qualifications and work experience.

### AIChE National Student Design Competition (NSDC) Problems

To prepare ChEPS students for internship during the second year and hone their soft skills, team design projects are integrated into two courses that are taught in Semester 1 and Semester 2 of the first year. One of the two courses which is taught in Semester 2 is CHE656: Process Analysis and Modeling.

There are 14 students in ChEPS Class 27. Within CHE656 for the academic year 2023, a new design problem format was devised that incorporates 5 AIChE NSDC (National Student Design Competition) problems. The 5 problems are:

- Year 1989 – Methanol and MTBE Synthesis from Vacuum Distillation Residue
- Year 1991 – Revamp Refinery NGL Processing Unit
- Year 1995 – Production of Methanol by a New Process Utilizing Methyl Formate as an Intermediate
- Year 2020 – Toppings Refinery Retrofit
- Year 2021 – Modular Distributed Gas-to-Liquids (GTL) Synthesis

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The 14 students were divided into 5 teams with 2-3 members per team by the course instructor to ensure that no two students will come from the same team in the design problems of Semester 1. Three oral presentations were set, namely one proposal presentation, one progress presentation, and one final presentation. The 3 presentations in Part (a) are worth 5% of the total grade of the CHE656 course. Every member in each team is required to participate in all the presentations. The presentation timetable will be announced once the semester starts.

Faculty members in ChEPS took turn serving as a member of a three-judge panel which grade the oral presentations. A final report is required and to be submitted a week after the final presentation.