



HANYANG UNIVERSITY

2019 HISS Research Project

(Process simulation and optimization of small-scale natural gas liquefaction process)

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Laboratory Research Center Information	
Topics	<ul style="list-style-type: none">• Computer-Aided Process Design• Process Systems Engineering
Activities	<ul style="list-style-type: none">• Process modeling, simulation and optimization• Conceptual process design; Techno-Economic Analysis
Achievement	<ul style="list-style-type: none">• Selected Publication: 55 peer-reviewed publications in the area of PSE since 2011• Corporate Project: Hyundai Heavy Industry; etc• Government Project: Korea Carbon Capture & Sequestration R&D Center; etc

Pre-requisite & Eligibility	
Academic Background	<ul style="list-style-type: none">• Basic knowledge on chemical and/or process engineering• Chemical thermodynamics / Heat transfer / Unit operations
Relevant Experience	Process simulation and computer programming (recommended but not mandatory)
Language	Intermediate or higher level of English

Objective & Description:	The project aims to develop process design framework for the design of small-scale natural liquefaction process with AspenHYSYS [®] simulator, with which various design options and operating conditions are evaluated and energy-efficient design is systematically determined through optimization. The student will be expected to carry out: <ul style="list-style-type: none">• Process modeling and simulation with AspenHYSYS[®] for small-scale natural gas liquefaction process• Sensitivity analysis of key design parameters• Process optimization study for minimizing energy consumption		
Project Duration	4 weeks	Project Hours:	minimum 80 hours

Hanyang International Summer School

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	Weekly Topic & Activities	Student Assignment
Schedule:	Week 1 <ul style="list-style-type: none"> • Introduction: Chemical Process Design with AspenHYSYS[®] • Overview of LNG liquefaction process • AspenHYSYS[®] Simulation <ul style="list-style-type: none"> - Unit operations for fluid flow 	
	Week 2 <ul style="list-style-type: none"> • AspenHYSYS[®] Simulation <ul style="list-style-type: none"> - Heat transfer units - Separators - Flowsheeting / recycling • Design project: LNG liquefaction process <ul style="list-style-type: none"> - Project definition - Process design basis 	<ul style="list-style-type: none"> • Midterm report <ul style="list-style-type: none"> - LNG liquefaction - Process modeling and simulation
	Week 3 <ul style="list-style-type: none"> • Design project: LNG liquefaction process <ul style="list-style-type: none"> - Process modeling - Sensitivity analysis - Heat integration 	
	Week 4 <ul style="list-style-type: none"> • Design project: LNG liquefaction process <ul style="list-style-type: none"> - Process optimization • Reporting <ul style="list-style-type: none"> - Final project report - Final oral presentation 	<ul style="list-style-type: none"> • Results of Design project <ul style="list-style-type: none"> - Final report - Presentation - Simulation file and other working files

Evaluation	Attendance	Midterm Report	Final Presentation and Project Report
	30%	20%	50%