

## STUDY PROGRAM :

# CHEMICAL ENGINEERING

## COURSE OUTLINE

Chemical engineers, also known as process engineers, are responsible for manufacturing processes in the industries that transform raw materials into a variety of valuable products through chemical, physical and biotechnological processes. These products include pharmaceuticals, food, cosmetics, herbal medicines/nutraceuticals, energy related products including oil/gas or biofuels, petrochemicals, polymers and biopolymers. Life Sciences content in our program will also equip IULI Chemical Engineering graduates with knowledge of biotechnology based processes that are becoming more prevalent in today's industries, particularly in the pharmaceutical, food and energy industries.

IULI's Chemical Engineering programme provides students with technical foundations to prepare them for a bright future career in chemical engineering or related fields. While the basic curriculum is strong in the chemical engineering field, in the final years, we focus our study and research in the field of pharmaceutical processes including herbal medicine, complemented by bioprocess engineering, which is unique to our Life Sciences programme.

## DOUBLE DEGREE AND ELECTIVE INTERNSHIP IN EUROPE

Furthermore, as part of our international programme, students will enjoy the experience of conducting cutting edge research in a German university. Added to an elective internship program in Europe, this will become their pathway to acquiring a double degree from Germany. Hence, our graduates will have substantial advantages when they are starting their national or international career, or continuing with higher education in Indonesia or abroad.

## FIELDS OF ACTIVITIES

Potential areas of employment for graduates of Chemical Engineering are numerous, both nationally and internationally, including:

- Pharmaceuticals and Herbal Medicine Industries
- Food industries and cosmetics industries
- Specialized food and pharmaceutical industries dealing with functional food focusing on nutraceutical products such as jamu (Indonesian Herbal Medicine), baby food, and other food for specific diets for health or for beauty
- Biotechnological manufacturing industries (pharmaceuticals, vaccines, fermentation based food industries, agricultural products)
- Energy Industries including biofuel and biogas as well as oil and gas
- Petrochemical and mining industries
- Chemical and pharmaceutical processing equipment suppliers
- Research and development (R&D) of new products throughout the entire value chain
- Entrepreneurship in various related products or services (agricultural, jamu/herbal industries, food industries, consulting)
- Quality Control, Quality Assurance, and Quality Management in industries
- Government institutions such as BPOM (Badan Pengawas Obat dan Makanan), Ministry of Health, Ministry of Agriculture, Ministry of Research, Ministry of Industry



Photo: International University Liaison Indonesia

**CURRICULUM 2017-2018**

Date/ Rev : 9 March 2016/ Rev. 3

Program : Bachelor

Valid : Batch 2016-2019

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SUBJECT	1	2	3	4	5	6	7	8	Total
<b>University Compulsory Subjects</b>									
English	2	2	2	2	2	1			11
Fundamentals of Computer Technology	2								2
E-Commerce			2						2
Environmental Sciences		2							2
Innovation and Product Development					2				2
Statistics & Probability		2							2
Research							6		6
Research Methodology						2			2
Ethics and Religious Philosophy					2				2
Civics				2					2
Pancasila		2							2
Indonesian Language and Culture						2			2
Oral Final Study Examination (OFSE)						0			0
Thesis								6	6
Elective: Internship/Project								3	3
<b>Total</b>	<b>4</b>	<b>8</b>	<b>4</b>	<b>4</b>	<b>6</b>	<b>5</b>	<b>6</b>	<b>9</b>	<b>44</b>
<b>Faculty Compulsory Subjects</b>									
Calculus and Linear Algebra I and II	3	3							6
Material Science	2								2
Biology	3								3
Chemistry	2								2
Chemistry Laboratory		1							1
Physics I and II	3	3							6
Physics Laboratory I and II	1	1							2
Algorithms, Programming, Data Structure		3							3
Organic Chemistry		3							3
Organic Chemistry Laboratory			1						1
Applied Mathematics			3						3
Biochemistry			3						3
Engineering Economy					2				2
Engineering Management								2	2
<b>Total</b>	<b>14</b>	<b>14</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37</b>
<b>Department Compulsory Subjects</b>									
Introduction to Life Science	1								1
Industrial Electronics and Laboratory	3								3
Numerical Methods				2					2
Fluid and Particle Mechanics			3						3
Mass and Energy Balance			2						2
Microbiology			2						2
Microbiology Laboratory				1					1
Physical Chemistry			3						3
Analytical Chemistry			2						2
Physical and Analytical Chemistry Laboratory				1					1
Heat Transfer Operations				3					3
Mass Transfer Operations					3				3
Chemical Engineering Thermodynamics				4					4
Transport Phenomena					2				2
Process Control						2			2
Chemical Industrial Technology				3					3
Plant Health and Safety					2				2
Chemical Engineering Operations Laboratory 1					1				1
Separation Process						2			2
Industrial Waste Water Treatment						2			2
Chemical Engineering Plant Design						4			4
Chemical Engineering Operation Laboratory 2						1			1
Chemical Reaction Engineering					4				4
<b>Elective Subjects (*)</b>									
Introduction to Biotechnology				3					3
Pharmaceutical Engineering Process Design					2				2
Pharmaceutical Engineering Unit Process						2			2
Bioprocess Technology						2			2
Pharmaceutical Chemistry					2				2
Advances in Engineering Research I and II				2		2			4
Bioprocess Technology 2							2		2
<b>Total</b>	<b>4</b>	<b>0</b>	<b>12</b>	<b>19</b>	<b>16</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>68</b>
<b>Total 1, 2, 3</b>	<b>22</b>	<b>22</b>	<b>23</b>	<b>23</b>	<b>24</b>	<b>22</b>	<b>6</b>	<b>9</b>	<b>151</b>
<b>LANGUAGE EXTRACURRICULAR</b>									
German	2	2	2	2	2	2			12

\* courses offered may change between semesters

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