Study Program: Biomedical Engineering – *"Bridging Engineering Design with Medical fields"*

Description: Biomedical Engineering is a multidisciplinary field that applies engineering design and concepts into applications within health and medical fields. Biomedical Engineers bridge the capacity of designing, testing and manufacturing of the engineers, with the needs of medical doctors, hospitals and clinics for various devices for diagnostics, therapeutics and patients monitoring tools. Biomedical Safety is another concern that biomedical engineers will bring into the manufacturing industries, since such devices are strictly regulated in their uses.

From the more simple devices, such as blood pressure monitor, blood glucose monitoring device, to the more complex devices such as ultrasound and X-ray units, up to the more complex systems such as PET/CT Scan for medical imaging for cancer diagnostic tools, these are examples of devices produced by cooperation between biomedical engineers and those who specialized in the medical fields. The roles of the Biomedical Engineers are crucial in designing and advancing these devices, and to further improve their functions, safety, and reliability.

Biomaterials, Biomedical Implants, Prosthetics & Biomechanics

Biomedical engineers also work on the advancement of biomaterials for biomedical implants and prosthetics. These biomaterials are materials, which can be natural or synthetic, that are utilized in numerous medical applications in order to support, to enhance, or to replace damaged body tissues, or biological functions. Biomedical engineers design and study how the specially chosen materials will fit into the function they need to replace, and ensure that these materials will safely interact with the human body. The fields of biomechanics and biocompatibility are crucial to consider, since various chemical and physical interactions will cause corrosion, frictions, as well as wear and tear of these materials that must be known prior to use for implantation. Biomedical Engineers are uniquely trained in these matters.

From Medical into Health and Beauty Applications

Our program also introduces students into technological spin-off from medical field into applications for health, fitness and beauty devices and applications. The advent of new technology and deeper knowledge of human body and physiology are also driving more innovation into the aesthetic of human body and human fitness. The devices that are recently introduced can provide superior results achievable when, for example, cosmetics alone were used for beautification. Such applications are still relatively new, and regulations that control these devices are also still evolving. Nevertheless, this is an exciting new field to study.

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Bioinformatics: Bioinformatics for biomedical engineering and for clinical applications demonstrates what these cutting-edge technologies can contribute, and drive the design of the most efficient study, including how to deal with the immense and complex body of data, to address specific clinical questions. The primary goal of the use of bioinformatics of computational intelligence fields is to create the tools that provide us a closer alliance with human intelligence. Clearly, biomedical engineers need to work very closely with the latest computer technologies and intelligent systems. At the same time, biomedical engineering and bioinformatics continue to expand, and being recognized as very important fields of work.

IULI 3+1 International Program in Germany

Students at Biomedical Engineering Program also have the opportunity to gain experience of studying, doing research, and working in an internship program in Germany in our **3+1 International program.**

In the program, students will study for 3 years in Indonesia at IULI, and will spend the last 1 year in Germany. Our partner, **TU Ilmenau (*Technische Universität Ilmenau*),** offers a unique and challenging experience that will open up the perspectives of our students to start their international career after graduation, or to continue with Masters and Doctorate degrees.

In this program, students will be given the chance to experience classroom study in Germany, while also doing fundamental cutting edge research supervised by experienced research team in our partner university. Finally, the internship program will give students new and exciting experience of working in Germany. This can be working in a company/industry, or in a university research laboratory. Such international experience is part of the design of our curriculum and study pathways at IULI, to prepare students for international career.

IULI 3+2 International Double Degree Program in Taiwan (S.T. & M.Sc.)

In this program, students will be given the chance to experience a unique cooperative program with NFU (National Formosa University), in Taiwan. Students will be studying at IULI for 3 years, and then continue to NFU for the remaining 2 years, to complete the Bachelor Degree (S.T), and Master's Degree (M.Sc.). Following this, the students are ready for working in the industries, or going straight to a Doctorate Degree Program. The multicultural setting faced by the students will give our graduates confidence to work in any international workplaces in the industries, or in the academic world as researchers or university lecturers.

Field of Studies: Physics • Chemistry • Biology • Electrical Engineering & Laboratories • Electric and Magnetic Fields • Biophysics and Bioelectricity • Biomechanics • Anatomy and Physiology • Biomedical instrumentations • Biomedical Laboratories • Biomaterial Engineering • Biomedical Imaging • Medical Biology • Biomedical Safety • Computer Programming • Signals and Systems • Digital Signal Processing • Microcontroller & Embedded System Design • Nanotechnology • Biotechnology • Herbal Medicine, Nutraceuticals, and Cosmetics • Innovations and new Products development • Engineering Economics • Biomedical Engineering System Design

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General Information:

Legal Base / Accreditation:	SK DIKTI No. 425/E/O/2014
Duration of Study:	4 years (8 semester)
Academic Year:	2 semesters (even + odd) Even Semester: February - July Odd Semester: August - January
Academic weeks/semester:	16 (14 academics + 2 exams)
SKS[1] per semester:	Max. 24
SKS per study:	144-160
Duration of a lecture:	50 minutes
Number of students per subject:	16-32
Language of Instruction:	English
Academic Degree:	Indonesia: Sarjana Teknik – S.T. (S1) International: Bachelor of Science (B.Sc)
Tuition Fee/semester:	Rp. 29.000.000
Online Application:	https://pmb.iuli.ac.id

[1] SKS: 1 SKS (preparation, lecture, exercises)

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Structure of a study:

1	2	3	4	5	6	7	8
	Semester 1-6: Academic Education (see curriculum), OFSE (Oral Final Study Examination)						
	Semester 7: Research Semester (abroad for Double Degree)						
	Semester 8: Thesis Defense, Graduation						

Score System:

Grade Letter	Grade Wording	IULI	Indonesian Grade	Germany Grade	Grade Descriptions	Student Representation
A	Excellent	86-100	4	1	Outstanding Performance	10%
B	Good	71-85	3.0-3.9	2	Performance is considerably higher than the average requirements	25%
C	Satisfactory	56-70	2.0-2.9	3	Performance meets the average requirements	30%
D	Poor	46-55	1.0-1.9	4	Performance is poor and likely to lead to failure	25%
F	Fail	<45	0	5	Performance does not meet the minimum criteria. Considerable further work is required	10%

Contacts:

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+62-8111799111

Curriculum: in SKS

University Compulsory Subjects			Semester								
			1	2	3	4	5	6	7	8	Total
1	English	ENGL	2	2	2	2	1	1			10
2	Computer Network & IT Security	CNIS	2								2
3	Applied Statistics	MATH		2							2
4	Research Methodology	RESM		2							2
5	Environmental Sciences	ENVI			2						2
6	Civics	CIVI				2					2
7	Ethics and Religious Philosophy	ETRP					2				2
8	Innovation & Product Development	PROD					2				2
9	E-Commerce	ECOM						2			2
10	Indonesian Language & Culture	IDLC						2			2
11	Pancasila	PANC						2			2
12	Oral Final Study Examination (OFSE)	OFSE						0			0
13	Research Semester	RESS							6		6
14	Elective : Internship / Project	INSP								3	3
15	Thesis / Thesis Defense	THES								6	6
	Total		**4**	**6**	**4**	**4**	**5**	**7**	**6**	**9**	**45**

Life Science Faculty Compulsory			Semester								
			1	2	3	4	5	6	7	8	∑
1	Introduction to Life Sciences	INLS	1								1
2	Physics & Laboratory 1	PHY1	3								3
3	Physics & Laboratory 2	PHY2		3							3
4	Engineering Mathematics 1	MAT1	3								3
5	Engineering Mathematics 2	MAT2		3							3
6	Applied Mathematics	MAT3			3						3
7	Numerical Methods	NUME				2					2
8	Chemistry	CHEM	2								2
9	Chemistry Laboratory	CHEL		1							1
10	Organic Chemistry	ORCH		3							3
11	Organic Chemistry Laboratory	ORCL			1						1
12	Electrical Engineering & Laboratory 1	EEL1	3								3
13	Electrical Engineering & Laboratory 2	EEL2		3							3
14	Material Science	MATS	2								2
15	Biology	BIOL	3								3
16	Biochemistry	BICH			3						3

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17	Algorithm, Programming 1	PRO1	3								3
18	Algorithm, Programming 2	PRO2		3							3
19	Engineering Economy	EECO					2				2
20	Metrology and Quality Control	MEQC			2						2
	Total		**20**	**16**	**9**	**2**	**2**	**0**	**0**	**0**	**49**

BME - Department Compulsory			**Semester**								
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**∑**
1	Electric and Magnetic Fields	EAMF			3						3
2	Microcontroller & Embedded System Design	MCES				3					3
3	Electronic Devices & Circuits 1	ECE1			2						2
4	Electronic Devices & Circuits 2	ECE2				2					2
3	Digital Signal Processing	DSPR					3				3
4	Anatomy and Physiology	ANPH			3						3
5	Signals and Systems 1 & 2	SSYS				2	2				4
6	Biomedical Instrumentation 1	BMI1				3					3
7	Biomedical Instrumentation Laboratory 1	BML1				1					1
8	Biomedical Instrumentation 2	BMI2					3				3
9	Biomedical Instrumentation Laboratory 2	BML2					1				1
10	Medical Biology	MEBI				2					2
11	Medical Imaging	MEIM						4			4
12	Biophysics	BIPH			3						3
13	Biomechanics	BIME					3				3
14	Biomedical Engineering System Design	BECD						4			4
15	Electives	ELEC				3	4	5			12
	Department		0	0	11	16	16	13	0	0	56
	Faculty		20	16	9	2	2	0	0	0	49
	University		4	6	4	4	5	7	6	9	45
	Total		**24**	**22**	**24**	**22**	**23**	**20**	**6**	**9**	**150**

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	Elective Courses (*)	
	Subjects	SKS
1	Introduction to Biotechnology	3
2	Introduction to nanotechnology	2
3	Biomedical Safety	2
4	Biomaterial Engineering 1	2
5	Biomaterial Engineering 2	2
6	Chemistry of Complex Compounds	2
7	Advances in Engineering Research	2
8	Quality Assurance and Management	2
9	Antibiotics	2
10	Instrumental Analysis	2
11	Cellular Biology	2
12	Indonesian Herbal Medicine	2
13	Nutraceuticals and Cosmetics	2

*) Elective Subjects offered may varied each academic year

Other Extracurricular Courses
German Languages (B1/B2 level by semester 6)

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