Universitas Sumatera Utara

Co-funded by the Erasmus+ Programme of the European Union

UNIVERSITAS SUMATERA UTARA

INFO DAY REPORT 2023

MASTER DEGREE IN INDUSTRY 4.0

UNIVERSITAS SUMATERA UTARA • 2023

ERASMUS+ IND 4.0 INFORMATION DAY REPORT

Date **: September 2, 2023**

Venue Address **: Intercoffee USU, Universitas Sumatera Utara, Jl. Universitas No.26, Padang Bulan, Kec. Medan Baru, Kota Medan, Sumatera Utara**

Seminar Room **: Intercoffee USU**

Participant **: 42 Participants (Attendance Attached)**

Information Day Program

Time	Activity
09.00 AM – 09.30 AM	Registration
09.30 AM – 09.45 AM	Welcome Speech
09.45 AM – 10.45 AM	Presentation of the Master Degree in Industry 4.0
10.45 AM – 11.30 AM	Discussions
11.30 AM – 12.00 AM	Social Gathering and Closing

Online Dissemination: https://ind4-0.usu.ac.id/en/news/erasmus-industry-40-info-days-di-inter-coffee-usu

Activity Photos

Info Days Participants

Registration Activity

Introduction to Erasmus Projects
(Emerson Pascawira Sinulingga ST., M.Sc. Ph.D)

Fast Track Program to support Masters in Industry 4.0
(Dr. Ali Hanafiah Rambe ST., MT.)

Fast Track Program to support Masters in Industry 4.0
(Prof. Dr. Ir. Fahmi S.T., M.Sc., IPM)

Discussion Session

Social Gathering and Lunch Session

Invitation and PPT

Kepada Yth.
Tim Erasmus+ Ind 4.0 USU
di Tempat

Dengan hormat,
Dalam rangka pembentukan peminatan/konsentrasi dan penyusunan kurikulum 2023, dengan ini kami mengundang Tim Erasmus+ Ind 4.0 USU untuk hadir pada:

Hari / Tanggal : Sabtu / 2 September 2023
Pukul : 09.00 - 12.00 WIB
Tempat : Intercoffe USU
Agenda : 1. Sosialisasi konsentrasi industri 4.0
2. Temu Ramah Tim Erasmus+, Dosen, Mahasiswa dan Alumni.

Demikian undangan ini kami sampaikan, atas kehadirannya kami ucapkan terima kasih.

Ketua Tim Erasmus+ Master in Industry 4.0 USU

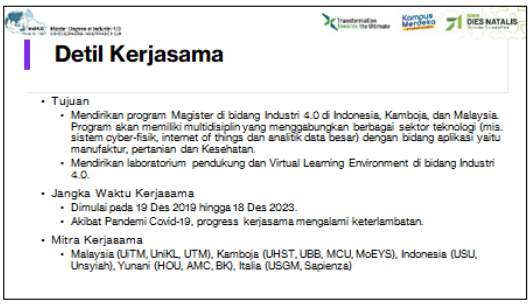
Emerson Pascawira Sinulingga ST., M.Sc. Ph.D

Agenda Acara
Erasmus+ Ind 4.0 Info Days
Intercoffe USU, 2 September 2023

Sabtu, 2 September 2023	
09.00 - 09.30	Registrasi
09.30 - 09.45	Pembukaan dan Kata Sambutan
09.45 - 10.45	Paparan Konsentrasi Industri 4.0
10.45 - 11.00	Diskusi
11.00 - 12.00	Temu Ramah dan Penutupan

Partners

ind4-0.usu.ac.id official.usu USU Official Universitas Sumatera Utara



Paket Pekerjaan (Work Packages)

Detail of Ind4.0 Work Package

WP Number	WP Name	Organizations
WP1	Identification of similar curricula and needs assessment in the subject area	Sapienza (P12)
WP2	Development of the Ind4.0 MSci Curriculum and VLE	HOU
WP3	Development of Educational Material, Labs Infrastructure & Capacity Building	USGM
WP4	Accreditation and Delivery of the Industry 4.0 MSc Programme	MoEYs
WP5	Quality Assurance and Monitoring	HOU
WP6	Dissemination and Exploitation	UHST
WP7	Management and Coordination	UiTM

Timeline Pembentukan Konsentrasi Keilmuan

No	Kegiatan	2022 I	2022 II	2022 III	2022 IV	2023 I	2023 II	2023 III	2023 IV
1	Penyusunan kurikulum dan materi pembelajaran								
2	Pengadaan alat dan kebutuhan laboratorium								
3	Pengadaan infrastruktur perkuliahan								
4	Pengajuan usulan Kurikulum Baru kepada Rektor								
5	Sosialisasi dan Perekrutan Mahasiswa Baru								
6	Perkuliahan Konsentrasi Magister Industri 4.0								

Bantuan Penguatan Laboratorium

Equipment Cost			
Work Packages	Total budget for equipment	Specification	Amount
Development	USU	Equipment for the Industry 4.0 Lab - Computational and storage infrastructure required for meeting the needs of the programme: - 5 High-end PCs; 5 High-end Laptops; 1 Printer/Scanner; - Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM) and Computer-Aided Engineering (CAE) simulation tools; - 1 3D printer	21,000.00

- Target tambahan dari kerjasama ini adalah mendirikan fasilitas laboratorium selaras dengan kebutuhan pembelajaran untuk menghasilkan lulusan yang kompeten menjawab kebutuhan SDM Revolusi Industry 4.0.

Usulan Kurikulum Erasmus+ Ind 4.0

1st Semester

Code	Course Title	Course Type	Application Area	ECTS
IND101	Big data analysis in Industry 4.0	F	All	6
IND102	Networking Technologies and Sensors	F	All	6
IND103	Artificial Intelligence	F	All	6
IND104	Industry 4.0 cyber-physical Systems Engineering	F	All	6
IND105	Cloud Computing Services and Technologies	F	All	6
IND106A	Digitalization of enterprises and business models	E	All	6
IND106B	Entrepreneurship, funding and innovation management	E	All	6

2nd Semester

Code	Course Title	Course Type	Application Area	ECTS
IND201	Cybersecurity of networks and cyber-physical systems	F	All	6
IND202	Advanced industrial and service robotics	E	All	6
IND203	Smart Factory Technologies and Concepts	E	All	6
IND204	User interfaces for Industry 4.0	E	All	6
IND205	Optimization and Intelligent Systems	E	All	6
IND206	Robotics and Industry 4.0	E	All	6
IND207A	Sustainable Product Design & Manufacturing	O	Manufacturing	6
IND207B	Agriculture/ Aquaculture system design	O	Agriculture 4.0/Aquaculture	
IND207C	Biosensors	O	Pervasive Health	

Usulan Kurikulum Erasmus+ Ind 4.0

3rd Semester: Manufacturing Application Area

Code	Course Title	Course Type	ECTS
IND310 1A	Thesis	F	20
IND310 1B	Placement	F	20
IND310 1	3D printing	O	5
IND310 1	Modelling, Digital Twins and Simulation	O	5

3rd Semester: Agriculture 4.0/Aquaculture 4.0: Application Area

Code	Course Title	Course Type	ECTS
IND310 1 A	Thesis	F	20
IND310 1 B	Placement	F	20
IND310 1	Autonomous robots	O	5
IND310 1	Ecosystems for optimised /precision farming/aquafarming	O	5

3rd Semester: Pervasive Health Application Area

Code	Course Title	Course Type	ECTS
IND310 1A	Thesis	F	20
IND310 1 B	Placement	F	20
IND310 1	Biosensors	O	5
IND310 1	Health Information Management and Pattern recognition	O	5

Legend:
F: Fundamental Course
E: Elective Course
O: Orientation Course

Daftar Mata Kuliah Pilihan Konsentrasi Industri 4.0

Semester	No	Kode Mata Kuliah	Mata Kuliah	SKS
I	1	TEE5101	Metode Penelitian	2
	2	TEE5102	Internet of Things	2
	3	TEE5103	Analisis Big Data	2
	4	TEE5104	Topik Khusus	2
	5	TEE5107	Cybersecurity dalam Industri 4.0	2
			Total	10

Daftar Mata Kuliah Pilihan Konsentrasi Industri 4.0

Semester	No	Kode Mata Kuliah	Mata Kuliah	SKS
II	1	TEE5201	Sistem Tertanam	2
	2	TEE5202	Kecerdasan Buatan	2
	3	TEE5207	Teknologi Jaringan dan Sensor	2
	4	TEE5208	Teknologi dan Layanan Komputasi Awan	2
	5	TEE5209	Robotika and Industri 4.0	2
			Total	10

Daftar Mata Kuliah Pilihan Konsentrasi Industri 4.0

Semester	No	Kode Mata Kuliah	Mata Kuliah	SKS
III	1	TEE5301	Kolokium	2
	2	TEE5302	Tata Tulis Ilmiah	2
	3	TEE5307	Pemrosesan Gambar Digital dan Medis	2
	4	TEE5308	Optimisasi Kecerdasan Buatan	2
	5	TEE5309	HCI untuk Industri 4.0	2
			Total	10

Daftar Mata Kuliah Pilihan Konsentrasi Industri 4.0

Semester	No	Kode Mata Kuliah	Mata Kuliah	SKS
IV	1	TEE6298	Seminar Hasil	2
	2	TEE6297	Publikasi Ilmiah	2
	3	TEE6299	Tesis	4
			Total	8
Total sks				38

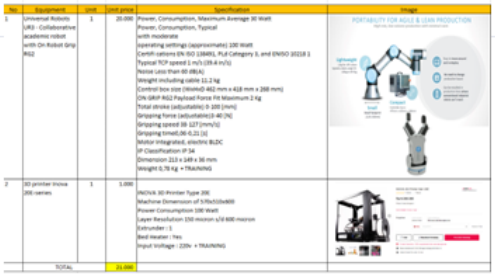
Matriks Organisasi Mata kuliah dalam Struktur Kurikulum Konsentrasi Industri 4.0

SEM	SKS	Jumlah MK	Kelompok Mata Kuliah Program Studi Magister Teknik Elektro		
			Mata Kuliah Wajib Universitas	Mata Kuliah Wajib	Mata Kuliah Pilihan
I	10	5		Metode Penelitian (2 sks) *Internet of Things* (2 sks) Analisis Big Data (2 sks) Topik Khusus (2 sks)	*Cybersecurity* dalam Industri 4.0 (2 sks)
II	10	5		Sistem Tertanam (2 sks) Kecerdasan Buatan (2 sks)	Teknologi Jaringan dan Sensor (2 sks) Teknologi dan Layanan Komputasi Awan (2 sks) Robotika and Industri 4.0 (2 sks)
III	10	5	Kolokium (2 sks) Tata Tulis Ilmiah (2 sks)		Pemrosesan Gambar Digital dan Medis (2 sks) Optimisasi Kecerdasan Buatan (2 sks) HCI untuk Industri 4.0 (2 sks)
IV	8	3	Seminar Hasil (2 sks) Publikasi Ilmiah (2 sks) Tesis (4 sks)		
Total	38	18	12	12	14

Penguatan Laboratorium Industri 4.0 USU

Lab Equipments Proposed by USU

dalam Euro



ICoBTA-IR4.0

About the conference: The emergence of the fourth industrial revolution in the past few decades has changed the technology, industries, and societal patterns and processes in the 21st century due to increasing interconnectivity and smart automation.

Theme: Industrial Revolution 4.0: Challenges of Sustainable Future

Banner Erasmus+ Ind 4.0 Info Days

Attendance List

ATTENDANCE LIST
UNIVERSITAS SUMATERA UTARA

Transformation Towards the Ultimate

Agenda : **Erasmus+ Ind 4.0 Info Days in Universitas Sumatera Utara, Indonesia**

Day/ Date : Saturday/September 2th, 2023

Time : 09.00 AM - 12.00 PM

Venue : Intercoffee USU

NO	NAME	INSTITUTION	PHONE NUMBER	SIGNATURE
1	Emerson P Simbolon	Erasmus+	081260602232	1 [signature]
2	Ali Hanafiah R.	S2 T.Elektro	085296302816	2 [signature]
3	HENDRI	PT TELKOM/ALUMNI	08127025050	3 [signature]
4	Peggy Aprillia KN	MTE	085321955252	4 [signature]
5	Rodiatul Adawiyah Perapat	MTE	082277520297	5 [signature]
6	Sulaiman	DTE	0811 6186118	6 [signature]
7	Nur	MTE	081361713606	7 [signature]
8	Andini Pratiwi	Ditgrasi	083361518590	8 [signature]
9	AZHARI	MTE	085283196040	9 [signature]
10	Febrian Sidabutar	MTE / IT Del	085261094689	10 [signature]
11	JIRE	MTE/YP. SUTOMO	0813 75047787	11 [signature]
12	Mangasi L. Siantar	MTE / YP. FMI	081277583420	12 [signature]
13	YUDIATNIS	MTE / POLRI	081263363686	13 [signature]
14	BAMBANG SUGITO	MTE / PERTAMINA	0813 7543 8781	14 [signature]
15	Andre Pranatas Depari	MM USU / Unilever	0822 7225 2070	15 [signature]
16	Rianli Dio Basranta S	MTE	085371016506	16 [signature]
17	Hari Buwon	MTE / PLN	081377343603	17 [signature]
18	Irsan Rosady	MTE / PELINDO	082165382578	18 [signature]
19	A. Risyal Nasution	MTE / Mandike	0895612336649	19 [signature]
20	Tania Octavia Harahap	MTE	081297431492	20 [signature]
21	M. ISMI KALLA	MTE	08126 2062274	21 [signature]
22	Yasinin	Vokasi	08116328080	22 [signature]
23	Eka Romaito	ALUMNI MTE / Pemko Tebing	081269762472	23 [signature]
24	Atikah Sari	YPI Sultan Andirja	081360654405	24 [signature]
25	Zul herri	alumni / BNI	085276743566	25 [signature]
26	Yahya Ahmadi Brata	MTE	08994784147	26 [signature]

NO	NAME	INSTUTION	PHONE NUMBER	SIGNATURE
27	Syafruddin Hasan	S2 - USU	0823648 79588	27
28	Dwi Budi Prasetyo	CV Mandike Instruments	0852 778 55899	28
29	stephanie pardede	Alumni S2 USU	082276004375	29
30	Rori Effriansa Wiaata	TMTE - Freelance.	085206809811	30
31	Ichsan Imam H	MTE	0852 9765 3869	31
32	Yohanta Fogar	TE USU	0813 70557477	32
33	Khairul Imam	Erasmus +	0812 8163 1376	33
34	Hassy Rahman Rat	Ditgrasi	082269707940	34
35	LILY MARISNA	Ditgrasi		35
36	SRI DWI MINDSIH	TELKOM	08116780100	36
37	Vera Manah	BIRO SIRENBANG	082161197077	37
38	Feisal Reza	Sirenbang		38
39	Musfika Hariyati	Sirenbang		39
40	Melani			40
41	Dwi Yuda S			41
42	Hasnul Arief Fahmi	Sirenbang		42
43				43
44				44
45				45
46				46
47				47
48				48
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50				50

Erasmus+ Industry 4.0
Universitas Sumatera Utara,

Emerson Pascawira Sinulingga ST., M.Sc. Ph.D
NIP. 197703302008011015

IND 4.0 INFO DAYS REPORT

Master Degree in Industry 4.0
Universitas Sumatera Utara

Date	: September 2, 2023
Venue Address	: Intercoffee USU, Universitas Sumatera Utara, Jl. Universitas No.26, Padang Bulan, Kec. Medan Baru, Kota Medan, Sumatera Utara
Time	: 09.00 AM – 12.00 PM
Participants	: Erasmus+ Ind 4.0 USU Team

1. Objective

The main objectives of the Erasmus+ Ind 4.0 Info Day revolved around fostering understanding and consciousness regarding the IND 4.0 Project, emphasizing the specialization in the Master's Degree program Industry 4.0, and facilitating a congenial gathering among Lecturers, Students, and Alumni associated with the Erasmus+ Ind 4.0 USU initiative.

2. Agenda

a. Industry 4.0 Master Degree Socialization
b. Social Gathering of Lecturers, Students, Alumni and Experts from the industries

3. Info Day Discussion

Universitas Sumatera Utara (USU) hosted the Info Days for the Erasmus+ Master Degree in Industry 4.0. The project itself is a collaboration of HEI from Indonesia with several HEI from countries such as Malaysia, Cambodia, Greece, and Italy. Meanwhile, USU is one of the representatives from Indonesia. The aim of the project is to provide practical solution so as to help closing the gap between industry needs/expectations and educational system outputs, in relation Industry 4.0 in the target countries such as Indonesia. Furthermore, the aim of the Industry 4.0 Master degree is to train Theoretical, Natural, Engineering, Computer Science and Information Technologies graduates to address the new challenges posed by the ever-increasing globalization in production, manufacturing and service provision. USU's Erasmus+ Master Degree In Indonesian 4.0 Program Coordinator Emerson Pascawira Sinulingga said that the purpose of this collaboration was to establish a master's program in Industry 4.0 in Indonesia, one of which was USU. This program combines various technology sectors with manufacturing, agriculture and health so as to meet USU's 2020-2024 Strategic Planning (Renstra) target and USU has laboratory facilities that meet the needs of industry 4.0.

In order to enhance the understanding and integration of the Industry 4.0 courses within the Master's program of Industry 4.0 studies, a series of socialization efforts have been conducted, delineating various challenges and developmental endeavors that need to be addressed. One of the established platforms includes a bridge between the industrial sphere and the campus environment, enabling direct communication of industrial issues. Despite the available equipment being at a 3.0 level and not yet embodying the characteristics of Industrial 4.0, developmental efforts are being contemplated. Presently, discussions are limited, necessitating a sustained discussion forum to foster interaction and the exchange of ideas. Formal collaboration between Institutions and USU Campus is also a focal point, aiming to integrate corporate programs with the academic environment. An essential step involves identifying other campuses that have successfully implemented the Industrial 4.0 concept to study best practices.

To support the teaching-learning process, students require further access to references such as IEEE journals. Hence, subscribing to IEEE becomes crucial. Similarly, to facilitate research activities, appropriate software (simulators) are needed, with a caveat on ensuring proper licensing. Another challenge lies in the limited understanding of S1 Electrical Engineering alumni in utilizing common workplace measurement tools, indicating the necessity for supplementary training programs. Additionally, the gap between the curriculum and the demands of the job market necessitates self-development and a broader understanding of economics and industry. This comprehensive report delineates efforts and challenges that need to be addressed to fortify the integration of Industrial 4.0 within the academic milieu of the Master's program in Industrial 4.0 at USU Campus.

4. Highlights

Courses Identity			
Course Name	Cybersecurity in Industrial 4.0		
Faculty	Engineering	**Study Program**	Master's Program in Electrical Engineering
Course Code		**Credit**	2
Course Group	Study Program	**Course enrollment**	Elective Course
Semester		**Offline Media**	Laptop, Projector, Whiteboard, and Markers

Courses Identity			
Lecture Method	Lectures, Seminars, Presentations, and Discussions	**Online Media**	E-learning, Zoom, Google Meet
Course Cluster	Technical Design and Problem-Based Experiential Learning	**Requirements**	-
Course Coordinator	Emerson Pascawira Sinulingga ST., M.Sc. Ph.D	**Lecturers**	
Course Name	HCI for Industrial 4.0		
Faculty	Engineering	**Study Program**	Master's Program in Electrical Engineering
Course Code		**Credit**	2
Course Group	Study Program	**Course enrollment**	Elective Course
Semester		**Offline Media**	Laptop, Projector, Whiteboard, and Markers
Lecture Method	Lectures, Seminars, Presentations, and Discussions	**Online Media**	E-learning, Zoom, Google Meet
Course Cluster	Technical Design and Problem-Based Experiential Learning	**Requirements**	-
Course Coordinator	Prof. Dr. Ir. Fahmi S.T., M.Sc., IPM	**Lecturers**	
Course Name	Robotica and Industry 4.0		
Faculty	Engineering	**Study Program**	Master's Program in Electrical Engineering
Course Code		**Credit**	2
Course Group	Study Program	**Course enrollment**	Elective Course
Semester		**Offline Media**	Laptop, Projector, Whiteboard, and Markers
Lecture Method	Lectures, Seminars, Presentations, and Discussions	**Online Media**	E-learning, Zoom, Google Meet
Course Cluster	Technical Design and Problem-Based Experiential Learning	**Requirements**	Robotica Course
Course Coordinator	Prof. Dr. Ir. Fahmi S.T., M.Sc., IPM	**Lecturers**	

5. Conclusions

In summary, the efforts to integrate Industrial 4.0 courses into the Master's program have revealed pivotal areas for improvement. Establishing platforms for industry-academia connection is noteworthy, but equipment limitations highlight the need for development to align with Industrial 4.0 standards. Encouraging sustained discussions, addressing equipment grant taxation, and forging formal collaborations are essential steps. Improving student access to references and software licensing is crucial, while alumni readiness and curriculum alignment signify the need for supplementary training and a broader industry understanding. This report underscores vital endeavors and challenges essential for the robust integration of Industrial 4.0 curriculum within the Master's program at USU Campus.