



INSTITUTE OF TECHNOLOGY OF CAMBODIA

MEETING THE BOARD OF TRUSTEES

General and Pedagogical Documents 2024-2025



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PART I: GENERAL DOCUMENT

1 INTRODUCTION

Since its establishment in 1964, the Institute of Technology of Cambodia (ITC) has received greater recognition for its successes and achievements in serving the country through human resources development, institutional capacity building and working intensely on the economic and infrastructure development of Cambodia. ITC, for more than four decades, has established a link between the French and English-speaking networks in the region and in the world. With its numerous collaborators, administrators, students, faculty staffs and alumni, this institution offers a unique multilateral context for an exchange of views with ministries, local authorities, NGOs, the private sectors and partner institutions.

ITC has a mission to train students with high-quality education in the fields of engineering, sciences and technologies and to develop innovative technology transfer. Students are provided with a strong scientific base and technical know-how and skills which allow their integration and evolution in the labor market. Based on the decision of the annual board meeting, the future orientation of ITC is to expand the engineering education area and develop research platforms in order to sustain the development of the country. This requires strengthening the basic scientific knowledge, developing research programs in connection with the private sectors and national and international stakeholders, supporting communities, fostering economic development through entrepreneurship programs, and helping our graduate students integrating the global economy. Ultimately, it is important for ITC to keep its own identity of a multilingual institution maintaining and expanding a network with French and English-speaking universities, to provide an education that motivates teaching staffs and students, stimulates creativities and inspires future ambitions, and to develop an internationally recognized research in adequacy with the needs of the society.

The vision of Institute has been set out based on the Rectangular Strategy Phase 4 of the Royal Government of the 6th legislative term of the National Assembly “**to improve work, equity and effectiveness, to form a basis towards achievement of Cambodia’s Vision for 2050**”.

2 PERSPECTIVE AND STRATEGIES

2.1 Perspectives

To become a leading institution with efficiency and excellence offering the academic, research, science, technology, innovation and engineering in technology transfer to the community.

ITC has adopted the new Strategic Plan (2021-2030) based on the Rectangular Strategy (Phase IV) of the government together with the National Strategic Development Plan (2019-2023). This Strategic Plan will provide directions for effective implementation of the Action Plans and address the challenges in order to improve the engineering education quality in a competitive environment.

Two main objectives of ITC Strategic Plan (2021-2030) to be reached by 2030 are as follows:

- 1- To train 17200 students with high qualification towards the Cambodia Vision 2030
- 2- To implement 175 applied projects with technology transfer and start-up for harmonization and development towards the Cambodia Vision 2030

2.2 Strategy of ITC

ITC has developed 5 main strategies to meet the 10-year objectives as follows:

- 1- Establish and apply academic program responding to the market needs with national and international recognition
- 2- Develop human resources and modernize technology for good governance, management and financial affairs
- 3- Develop physical infrastructure and modernize the laboratories
- 4- Establish the investment projects and applied research projects targeting to start-up and technology transfer
- 5- Modernize the data information system for dissemination of activities and results to the communities

2.3 Result Framework

The Result Framework for 10 Years: 2021 to 2030-Institutional Level is presented in Table 1.

Table 1: Result Framework for 10 Years: 2021 to 2030-Institutional (Institute) Level

Indicators	-	Basis	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
1. Number of students graduated from national program with minimum quality standard	Admitted postgraduate students	0	0	0	20	100	180	260	340	440	540	640	640
	Graduated postgraduate students	0	0	0	0	18	90	162	234	306	396	486	486
	Admitted engineer students	0	0	140	1180	3760	6600	8090	9690	11450	13270	15090	15090
	Graduated engineering students	0	0	0	0	126	1070	3497	6138	7524	9012	10649	10649
	Admitted technical students	0	0	150	800	1500	2200	2900	3600	4300	5000	5700	5700
	Graduated technical students	0	0	0	135	731	1395	2046	2697	3348	3999	4650	4650
2. Number of students graduated from international program	Admitted postgraduate students	0	0	0	30	80	130	220	310	400	490	580	580
	Graduated postgraduate students	0	0	0	0	27	76	124	209	295	380	466	466
	Admitted engineer students	0	0	0	25	75	230	460	690	1000	1360	1720	1720
	Graduated engineering students	0	0	0	0	0	23	70	213	435	656	950	950

Indicators	-	Basis	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
3. Number of Research Studies in connection with development		62	83	93	103	108	114	121	129	137	145	153	153
4. Number of Research Studies on Technology Transfer		0	0	0	0	0	0	0	2	2	2	4	4
5. Number of Business Startup Projects		0	0	0	0	0	4	4	8	11	14	18	18
6. Number of international programs		0	0	0	1	2	7	9	9	14	15	15	15
7. Number of national programs with minimum quality standard		0	0	2	13	15	18	19	22	24	25	25	25
8. Number of students who have received middle income (at least five times of unskilled workers' salaries)		0	0	0	0	62	385	1089	1925	2487	3083	3753	3753
9. Number of Center of Excellence		0	0	0	0	1	1	2	2	3	3	4	4
10. Number of publications of international scientific articles		39	59	84	109	139	169	204	239	279	319	359	359

3 OVERALL PROGRESS OF PERSPECTIVES 2023-2024

In the academic year 2023-2024, ITC proposed 17 main activities in total, in which 3 activities for modification and improvement of associate programs, 3 activities for curriculum updating and 2 for new establishment of engineering programs, 4 activities for establishment of international programs, 2 activities for establishment of lab, 1 for implementing all research projects, and 2 for capacity building of ITC staffs. As results, 9 main activities (engineering programs) were completed within the academic year. All necessary documents for international programs were technically prepared but, however, only “software engineering” could be implemented from academic year of 2023-2024. For other programs, require more promotion activities to attract enrollment.

The 2 proposed labs were completed installed and start implementing. 91 research projects in total were implementing from all 5 research units. 25 of them are completed and other 66 projects are continued implementing in 2023-2024. All capacity building on T&L and research skill, both inbound and outbound, of ITC staffs were completed within the schedule. Summary of the progress activities is illustrated in Table 2.

Table 2: Overall progress of the proposed activities in perspective 2023-2024

No.	Main activities proposed in 2023-2024	Unit	# Proposed	# Achieved by Feb 2024	Status
I Revision/Establishment of Associate Programs					
1	Propose to modify the associate degree program “Mechanical and Plumbing System” from subject-based to competency-based training	Program	1	1	Completed
2	Propose to change name of associate degree program from “Rural Engineering” to “Water Supply and Plumbing”	Program	1	1	Completed
3	Propose to change name of associate degree program from “Civil Engineering” to “Civil and Structural Engineering Design and Supervision (CSEDS)” and modify from subject-based to competency-based training	Program	1	1	Completed
II Revision/Establishment of Engineering Programs					
4	Propose to modify of Chemical Engineering program of Faculty of Chemical and Food Engineering	Program	1	1	Completed
5	Create new program under faculty of Geo-resources and Geotechnical Engineering	Program	1	1	Completed
6	Create new program namely “Program of Materials Science and Engineering” under GGG faculty	Program	1	1	Completed
7	Modify/improve the Architectural Engineering program of Faculty of Civil Engineering	Program	1	1	Completed

No.	Main activities proposed in 2023-2024	Unit	# Proposed	# Achieved by Feb 2024	Status
8	Modify/improve the engineering program in Data Science	Program	1	1	Completed
III Revision/Establishment of Graduate Programs					
	N/A				
IV Revision/Establishment of International Programs					
9	Establishment of international program "Bachelor of Software Engineering"	Program	1	1	Completed
10	Establishment of international program "Bachelor of Construction Management and Infrastructure"	Program	1	1	Completed
11	Establishment of international program "Bachelor of Electronics and Smart Automation System"	Program	1	1	Completed
12	Establishment of international program "Bachelor Degree of Engineering and Sustainable Business (BESB)"	Program	1	1	Completed
V Establishment of labs/centers/platforms					
13	Establishment of two labs: 1) Digital-control Fabrication Lab or FABLAB (MIT) and 2) Electromagnetic Compatibility or EMC Lab	Lab	2	2	Completed
VI Implementation of Research Projects					
14	Implementing research projects for all 5 research units	Research project	91	25	- 25 research projects are completed in 2023 - 66 projects are continued implementing in 2024.
VII Capacity Building of ITC staffs					
15	Capacity building on T&L and research of ITC staffs (inbound)	Person	113	133	Completed

No.	Main activities proposed in 2023-2024	Unit	# Proposed	# Achieved by Feb 2024	Status
16	Capacity building on T&L and research of ITC staffs (outbound)	Person	32	32	Completed

4 PERSPECTIVES AND ACTION PLAN FOR 2024-2025

4.1 Propose main activities/outputs in perspective 2024-2025

There are 24 main activities for perspective in academic year 2024-2025. 3 activities for establishment of new associate degree programs; 8 for curriculum modification/improvement of engineering programs; 2 for establishment and modification of international programs; 1 for establishment of new master program; 1 for modification the name of research unit; 1 for human resources plan; and 8 for newly institutional development project implementation. The summary of the proposed activities is shown in Table 3.

Table 3: Proposed main activities/outputs of ITC's perspective 2024-2025

No.	Main activities proposed in 2024-2025	Unit	Faculty/ Department	Estimated completion date
I	Revision/Establishment of Associate Programs			
1	Propose to establish the associate degree program "IT Network and Programming" (see Annex 1)	Program	GIC	Aug 2024
2	Propose to establish the associate degree program "Industrial Engineering" (see Annex 2)	Program	GIM	Aug 2024
3	Propose to establish the associate degree program "Geotechnical Engineering" (see Annex 3)	Program	GGG	Aug 2024
II	Revision/Establishment of Engineering Programs			
4	Modify/improve the Civil Engineering program of Faculty of Civil Engineering (see Annex 4)	Program	GCI	Aug 2024
5	Modify/improve the Transport and Infrastructure Engineering program of Faculty of Civil Engineering (see Annex 5)	Program	GTI	Aug 2024

No.	Main activities proposed in 2024-2025	Unit	Faculty/ Department	Estimated completion date
6	Modify/improve the Geo-resources and Geotechnical Engineering program (see Annex 6)	Program	GGG	Aug 2024
7	Modify/improve the Mechanical Engineering program (see Annex 7)	Program	GIM	Aug 2024
8	Modify/improve the Industrial Engineering program (see Annex 8)	Program	GIM	Sept 2024
9	Modify/improve the Water Resources Engineering and Rural Infrastructure program (see Annex 9)	Program	GRU	Sept 2024
10	Modify/improve the Water and Environmental Engineering program (see Annex 10)	Program	GRU	Sept 2024
11	Modify/improve the Chemical Engineering program (see Annex 11)	Program	GCA	Sept 2024
III	Revision/Establishment of International Programs			
12	Establishment of international program "Artificial Intelligence Engineering and Cybersecurity (AIECS)" (see Annex 12)	Program	GIC	Jul 2024
13	Modification of Industrial Engineering and Supply Chain Management Program (see Annex 13)	Program	GIM	Nov 2024
IV	Revision/Establishment of Graduate Programs			
14	Establishment of new master program "Architectural Engineering" (see Annex 14)	Program	GS	Oct 2024
V	Establishment of labs/centers/platforms			
15	Propose to revise name of research unit from "Materials Science and Structure" to "Materials and Built Environment" (see Annex 15)	Research Unit	RIC	Sept 2024
VI	Human Resources Development			
16	<ul style="list-style-type: none"> - Increase of staffs with Ph.D holder from 95 to 107 - Increase of staffs with Master holder from 132 to 146 	Person	ITC	Oct 2024

No.	Main activities proposed in 2024-2025	Unit	Faculty/ Department	Estimated completion date
VII	Institutional Development Project Implementation			
17	Implementation the project: “SATREPS: Establishment of Risk Management Platform for Air Pollution in Cambodia” - JICA	Project	ITC	Jul 2022 - 2027
18	“Institutional Support to Institute of Technology of Cambodia” – ARES-CCD	Project	ITC	Sept 2022 - 2027
19	“Science and Technology Project in Upper Secondary Education (STEP UP)” - ADB	Project	ITC	2023 - 2029
20	“Skills for Future Economy (SFE)” - ADB	Project	ITC	2023 - 2029
21	“Research and Training Platform on Power System” – EU/AFD	Project	ITC	2023 - 2027
22	“Energy Transition Sector Development Program (ETSDP)” - ADB	Project	ITC	2024
23	“Project for Enhancing Industry-Academic Networks for Engineering Research and Development in Cambodia - JICA	Project	ITC	Possible to start from Oct 2024 - 2029
24	“2 nd Higher Education Improvement Project” – 2 nd HEIP – World Bank	Project	ITC	Possible to start from Oct 2024 - 2029

4.2 Baseline and projected data of number of students, staffs and labs

The number of students, PhD staff, lab for baseline 2023-2024 and projected 2024-2025 is given in Table 4.

Table 4: Number of students, staffs, and labs for baseline 2023-24 and projected 2024-2025

Faculty	Department/ Option	Baseline Academic Year 2023-2024								
		No. Technician Student	No. Eng. Student	No. Master Student	No. PhD Student	No. Master Staffs*	No. PhD Staffs*	No. Support Staffs	No. Lab (Teachning)	No. Lab (Research)
	Tronc Commun		2737			10	0	2	3	
Faculty of Civil Eng.	GCI	311	683			5	19	7	4	
	Arch		248			5	2			
	Transport		123			1	2			
Faculty of Electrical Eng.	GEE	344	447			21	6	4	8	4
	GTR	41	123			4	5	2	4	3
	GIM	108	387			24	8	5	10	3
	GIC		245			17	2	12	9	2
	AMS		184			4	3	1	2	
Faculty of Chemical and Food Eng.	Food	319	337			20	19	11	6	3
	Chemical		220							
Faculty of Hydrology and Water Resources Eng.	WRI	16	163			10	16	12	11	4
	WEE		102							
Faculty of Geo-resources and Geotechnical Eng.	GGG		194			11	13	3	6	2
Graudate School	GS			124	54					
TOTAL		1139	6193	124	54	132	95	59	63	21

Faculty	Department/ Option	Planned Academic Year 2024-2025								
		No. Technician Student	No. Eng. Student	No. Master Student	No. PhD Student	No. Master Staffs	No. PhD Staffs	No. Support Staffs	No. Lab (Teachning)	No. Lab (Research)
	Tronc Commun		2880			10	0	2	3	
Faculty of Civil Eng.	GCI	310	710			5	20	7	6	
	Arch		273			5	4			
	Transport		200			3	2			
Faculty of Electrical Eng.	GEE	320	494			21	7	4	8	4
	GTR	80	182			6	5	4	5	3
	GIM	120	404			25	9	7	16	4
	GIC		272			17	3	11	12	2
	AMS		272			7	3	2	2	
Faculty of Chemical and Food Eng.	Food	310	332			22	23	13	8	3
	Chemical		263		0					
Faculty of Hydrology and Water Resources Eng.	WRI		189			10	18	12	11	2
	WEE		116		2					
Faculty of Geo-resources and Geotechnical Eng.	GGG		257			15	13	3	6	2
Graudate School	GS			150	50					
TOTAL		1140	6844	150	50	146	107	65	77	22

4.3 Pedagogy

- Implement Fab-lab (through HEIP project)
- Implement Lab-based education (through JICA project)
- Implement competency-based training
- Implement project-based learning
- Increase hand-on practice in the lab and field
- Introduce e-learning classes (encourage staff to develop more E-Learning courses)

4.4 Quality Assurance

- **Strengthen the internal quality assurance system**
 - Coordinate with relevant departments to organize seminars/workshops related to QA and Learning and Teaching for all lecturers four times per year.
 - Develop an action plan for the Internal Quality Assurance (IQA) guideline, including actions to strengthen and develop the capacity of ITC staff.
 - Ensure a cohesive curriculum pathway: from associate's degree, engineering degree, master's degree to Ph.D. degree.
 - Manage Seminar/Workshop related to QA, Learning and Teaching.
- **Enhance the capacity of internal quality assurance officers**
 - Participate in training with ACC, DGHE, and relevant HEIs to develop IQA skills.
 - Attend every meeting and activity related to IQA at ITC.
- **Prepare internal assessment mechanisms to monitor and evaluate educational quality**
 - Conduct internal self-assessment reports (SARs) for the 15 engineering programs (GCI, GAR, GIM (2), GCA (2), HRE (2), GGG, GIC, GEE (2), GTR, GTI, AMS) (program level).
 - Conduct an internal assessment of the Institution (institutional level).
 - Conduct student satisfaction surveys twice a year.
 - Create a student grievance platform.
 - Conduct a tracer study for recent graduates.
- **Applying for ACC accreditation.**

4.5 Promote Research and Innovation

- **Activities/Strategy of Research 2024 - 2025**
 - Strengthen triple-helix collaboration (University, Industry, Government)
 - Expand research collaboration with local and international partners
 - Increase peer-reviewed publication
 - Submit the application of Techno-Science Research Journal to ASEAN Citation Index
 - Increase the number of proposals to be submitted for local and international funding
 - Promote the research outputs to communities and public
 - Continue the capacity building of researchers and motivating them
 - Increase the number of graduate students through projects
 - Commercialize the products developed
 - Increase the lab analysis service and short training service
 - Prepare for lab set-up in 5 research units at new center
 - Prepare for Center of Excellence
 - Prepare for lab accreditation
 - Encourage researchers to learn more about patent search and patent application
- **Capacity building for researchers**
 1. Project proposal writing training

2. Journal publication writing training
3. Project and team management training
4. Patent search and Intellectual property registration training
5. Start up and entrepreneurship training

Action Plan 2024 – 2025

➤ **Laboratory Management**

- To organize two trainings on the principle of analytical instruments for research students and researchers at the beginning of the new Semester 1 and 2 (February and August)
- To organize laboratory orientation and exams at least two times per semester.
- To extend laboratory utilization through research collaboration and external service
- To prepare lab layouts and new equipment needed in order to set up new labs for better lab management at new center

➤ **Research, Development and Dissemination**

- To apply for research funds from 5 research units
- To join research projects with collaborating partners (e.g., AFRICAM)
- To join and organize research dissemination workshops, training, and seminar related to 5 research units

➤ **Toward ACI for Techno-Science Research Journal**

- Improve quality of publication toward the application for ASEAN Citation Index – plan for the application is within 2024
- Complete journal website and launch the online platform – all manuscript submission and editorial process will be done through the online in 2023
- Organize the 4th workshop on improving scientific paper writing to junior researchers, graduate students, and engineering year 5 students

4.6 Research Projects implementing in 2024-2025

In academic year 2023-2024, 91 research projects in total have been implementing at ITC from all 5 research units. As results, 25 research projects are completed successfully and other 66 projects are continued implementing in 2024-2025. There are 27 new projects are approved and have been conducting their research activities. The 27 new research projects can be seen in Table 5 and all 91 projects and newly 28 proposing research projects are listed in Annex 16.

Table 5: Detail of 27 new research projects in 2024-2025

No.	Name of PI	Sex	Research title	Period	Budget
1	Dr. OR Chanmoly	M	Accelerating Digital Transformation for Higher Education Institutions in Southeast Asia (DX.SEA)	2023-2025	Erasmus+
2	Dr. YOEU Sereyvath	M	Production of Organic-mineral Fertilizers from Local Raw Materials	2023-2024	MoEYS
3	Mrs. SIENG Sreyvich	F	Assessment of Air Quality and Impact in Potential Areas in Cambodia	2023-2026	JICA/JST
4	Dr. TAN Reasmey	F	Development of Oyster Sauce from Cambodian Oysters and Green Mussels for Commercialization	2023-2024	CAPFish-UNIDO-EU
5	Dr. MITH Hasika	M	Health Risk Assessment and Quality Improvement of Cambodian Smoked Fish	2023-2024	CAPFish-UNIDO-EU
6	Dr. IN Sokneang	F	Improvement on Quality, Safety, and Shelf-life (including packaging) of Fermented Pangasius Fish for Accessing to New Markets	2023-2024	CAPFish-UNIDO-EU
7	Dr. PENG Chanthol	F	Feasibility Study of Siem Reap's Prahok toward Geographical Indication: History, Technology, and quality	2023-2024	CAPFish-UNIDO-EU
8	Dr. IN Sokneang	F	Study on the Effect of Steam Conditions (Temperature, Time, and Green Mussel Size) on the Organoleptic Quality and Safety Quality of Green Mussels	2023-2024	CAPFish-UNIDO-EU
9	Dr. SUONG Malyna	F	Laboratory of Excellence in Co-Engineering for Sustainable Agrosystems (LMI-LEAD)	2024-2028	IRD
10	Dr. SUONG Malyna	F	Promoting Integrated Pest Management and Sustainability of the Fragrant Rice Quality in Cambodia by Valorization of Native Microbiota	2024-2026	Ministry of Europe and Foreign Affairs (via The Embassy of France)
11	Dr. SUONG Malyna	F	Soil-Borne Legacy and Microbiota-Mediated Disease Resistance in Rice-Based Systems in Cambodia	2024	Agropolis Fondation
12	Dr. SUONG Malyna	F	Training in the Use of Molecular Tools for Diagnosis of Rice Diseases to Support the	2024-2026	IRD

No.	Name of PI	Sex	Research title	Period	Budget
			Transition towards Integrated Pest Management		
13	Dr. VALY Dona	M	Integrated Decision Support System for Non-Communicable Ocular Diseases using Machine Intelligence	2023-2024	ASEAN IVO
14	Ms. OUM Sotheara	F	Development of Autonomous and Semi-Autonomous Mobile Robots to Participate in Robocon 2024	2023-2024	Takahashi Foundation
15	Dr. KAN Kuchvichea	M	Evaluation Technico-Socio-Economique des Infrastructures Routières au Cambodge	2023-2025	ARES
16	Mr. SOM Chansamngang	M	Effect of the Addition of Natural Fibers on Shrinkage, Cracking Risk and Healing Capacity of Cementitious Materials	2023-2026	BGF-MoEYS
17	Dr. PROK Narith	M	Performance of Tyfo(R)FibrAnchor under Axial Load	2023-2024	Fyfe Asia
18	Dr. OEUNG Thaileng	M	Investigation of Steel-Concrete Composite Structural Elements under Various Loadings	2023-2024	TMU
19	Dr. YOS Phanny	M	FSPI-R: Metal-Related Skill and Create Link with Archeo-Metal Activities in Cambodia	2023-2024	French Embassy
20	Mr. SOK Sereyvathana	M	Removal of Organic Micropollutants by Coupling Simultaneous Continuous Adsorption and Sedimentation for Drinking Water Production	2023-2026	BGF & MoEYS
21	Dr. THENG Vouchlay	F	Photoproduction of Radicals and their Effects on Carbon Dynamics in Tropical Lakes (JSPS-Photochem)	2023-2027	JST
22	Dr. SOK Ty	M	Development and Social Implementation of Greenhouse Gas Emission Reduction Technologies in Paddy Fields of West Tonle Sap Lake by Establishing a Large Paddy Area Water Management System	2024-2028	JST/JICA
23	Dr. SOK Ty	M	Integrated River Basin Management of the Mekong Basin Tributary for Adaptation to Climate Change	2024-2027	Mekong Korea Cooperation Fund (MKCF)

No.	Name of PI	Sex	Research title	Period	Budget
24	Dr. BUN Saret	M	Stopping Macro- and Microplastic Pollutants by Installing Solar-Powered Air Bubble Screening (SBS) Device at Discharge Wastewater Canal to the Sea of Sihanoukville, Cambodia	2024	UNDP
25	Dr. BUN Saret	M	Rural Community Training on Safe Water Quality and its On-site Demonstration Testing	2024	SUMERNET
26	Dr. BUN Saret	M	Addressing Water Scarcity through Groundwater Use: Development of Solar-Powered Groundwater Treatment System for Remote Area of Cambodia	2024-2025	MTT-RRP
27	Dr. Ratha MUON	F	Réhabilitation et Gestion Durable de la Fertilité des Sols pour Uneagriculture Durable et Résiliente au Cambodge (ReaSol)	2023-2025	IRD

4.7 Promote Graduate School 2024-2025

- **Mission of the Graduate School for 2021-2030**
 - Improve and develop **10 graduate training programs** in STEM to align with national, regional, and international standards.
 - Educate **952 graduate students** to have full potentials and skills in STEM to meet the requirement of the Cambodia's 2030 vision.
- **Strategy of Graduate School**
 - Improve and develop the curriculum of master and doctoral programs.
 - Develop the laboratory, facility and ICT system responding to the master and doctoral training needs.
 - Internationalize the master and doctoral programs via double degree programs and mobility exchanges.
 - Enhance the capacity of administration and teaching staffs.

Action Plan 2024 – 2025

- **Program Implementation**
 - Operate 8 thematic master programs and 5 doctoral programs.
 - Increase number of research topics that respond to the societies needed through support from research fund institutions.
 - Increase number of students' publications in journals/conferences
 - Conduct students' satisfaction for courses in master programs.
 - Preparation for AUN-QA for 3 programs (M-WEE, M-ETM, M-DAS)
- **Program development and improvement**

- Establish new Master program in Architectural Engineering (See Annex 14).
- Develop e-learning courses for master programs.
- Initiate the curriculum development for a new master program in management of technology.
- Initiate the curriculum improvement for doctoral programs.
- **Internationalization**
 - Increase number inbound and outbound exchanges of master students.
 - Increase number of staff mobility to abroad
 - Increase number of guest lecture from international partners.
- **Partnership**
 - Enhance collaborations with existing partners: 21 academics institution, 4 development agencies and 3 Government/Private sectors/NGO.
 - Increase number of partners via the double degree doctoral program agreement
- **Project**
 - Implement the EDC-AFD-EU project to support Master and Doctoral program in Energy and Technology Management 2023-2027
 - Implement the Erasmus+ project for Master program in Materials and Structural Engineering 2022-2025.
 - Implement the Erasmus+ project “Smart City for ASEAN Learning Network (SCALE)” for micro-course development and integration into relevant master programs.
 - Apply for AUF project to support Master of Materials and Structural Engineering.
- **Promotion**
 - Create promotional video containing successful showcase of master and doctoral graduates.
 - Participate in study fair and other event to promote the master and doctoral programs.
 - Improve the webpage of graduate school.
- **Tracer study**
 - Conduct employment survey for fresh graduate.
 - Conduct employment survey for alumni who graduated master’s degree in 2019 (5 years after graduation).
- **Capacity building**
 - Conduct training on student supervision.
 - Conduct training on using Moodle and e-learning.
 - Create staff and lecturer e-portfolio.
 - Participate in AUN-QA training sessions

4.8 Promote University-Industry Linkage (UIL) 2023-2024

➤ Mission of UIL

From academic year 2022-2023, UIL is reforming its mission to more focus on target result outputs towards quality improvement of academic programs, research, and services in whole ITC including the governance of UIL.

The main missions of UIL are as follow:

- (1) Improvement of the quality and relevant of academic programs in all levels
- (2) Improvement of research activities and collaboration especially on research product outreach and commercialization
- (3) Upgrading the services from all sectors in ITC such lab testing, training, consultancy, and renting services.

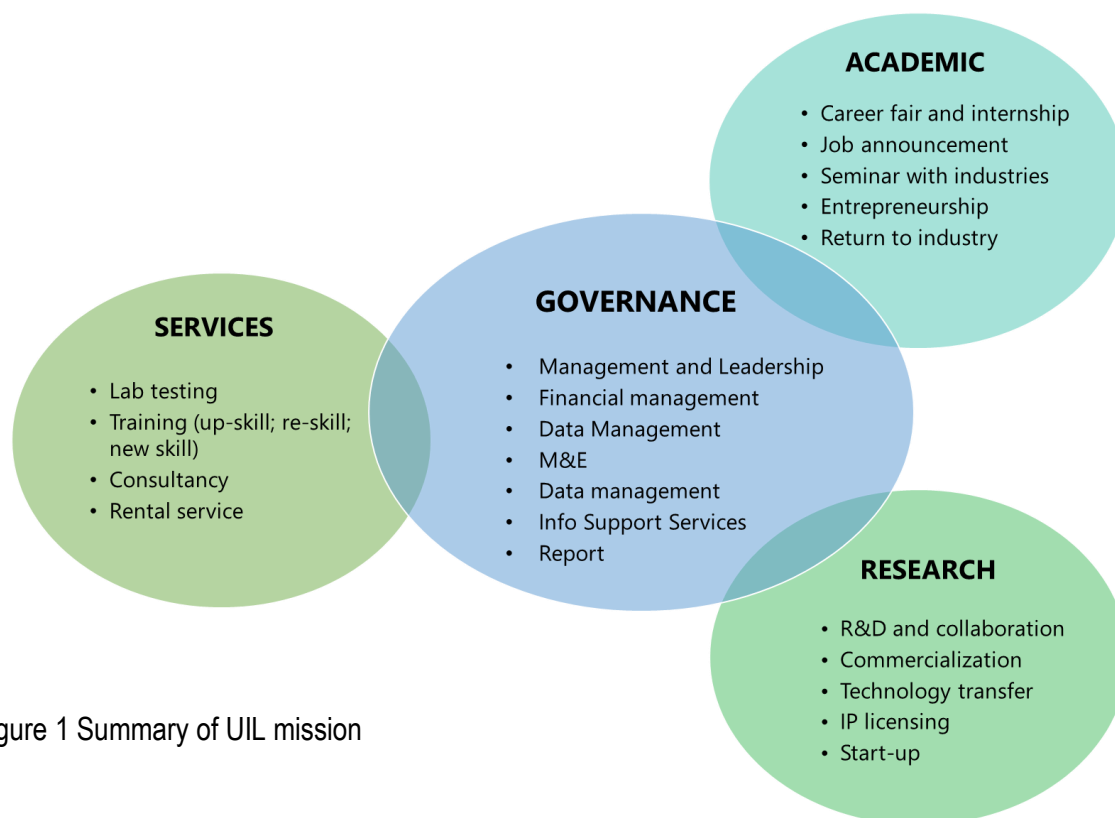


Figure 1 Summary of UIL mission

Table 6: Goal and Mission of UIL

Goal	
UIL contributes to enhances the quality and relevance of academic programs, research and services towards Cambodia Vision 2030 and 2050.	
Mission (Outcome)	Main Activities
1. Support the academic programs in all levels to enhance the quality of graduates for better jobs and better pays	1.1. Produce clear coordination mechanism and guideline between UIL office and all programs in charge person for smoother operation. 1.2. Initiate and introduce the new concept of internship scheme trough project-based learning with industry. 1.3. Organize annual event on career fair with all relevant stakeholders. 1.4. Coordinate the join activities with the faculty/head of programs and industries to improve the 21 st century skills to lecturers and students.
2. Support the research activities toward product commercialization through closely link with industry	2.1. Create a communication platform in both physical and online for information access between ITC and industries. 2.2. Organize regular promotion events to promote research collaboration link with industry toward product prototype/start-up/commercialization.

3. Support all relevant stakeholders to improve the quality of services	3.1. Produce the list of all type of services including testing, training, equipment rental, and consultancy from relevant stakeholders. 3.2. Develop marketing promotion materials related to ITC's services. 3.3. Support training to faculty/department staffs on content development of skill/professional training. 3.4. Produce better mechanism and regulation for consultancy service in ITC.
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Perspectives of UIL for 2024-2025

Table 7: Proposed main activities/outputs of UIL's perspective 2024-2025

No.	Result indicators for UIL	Timeframe	Responsible	Strategy
1	Develop strategy and result framework for UIL 2024-2026	Oct 2024	<ul style="list-style-type: none"> - Dr. Bun Kim Ngun - UIL main office - All faculty/department - RIC 	Meet and discuss with the stakeholders
2	Develop data management system (platform) for UIL main office and department-UIL	Dec 2024	<ul style="list-style-type: none"> - UIL main office - All faculty/department - RIC 	Need budget to build the platform (HEIP and others)
3	Visit industries to discuss industry needs, promote ITC services and other possible collaborations	Dec 2024	<ul style="list-style-type: none"> - UIL main office - All faculty/department - RIC 	<ul style="list-style-type: none"> • Contact potential companies for visiting opportunity
4	Organise annual ITC-Industries consortium meeting to get the feedback from industries for improvement of ITC	Dec 2024	<ul style="list-style-type: none"> - All relevant person 	<ul style="list-style-type: none"> • Organize attractive consortium meeting <p>Work with projects (LBE/ADB) to engage more companies</p>
5	Develop "Intellectual Property Policy" for ITC	Apr 2024	<ul style="list-style-type: none"> - Dr. SANG Davin - Dr. YIN Molika - RIC - All faculty/department 	<ul style="list-style-type: none"> • Collecting existing-drafted IP policy from relevant project (CAPFISH, LBE and ERIA) to write IP policy for ITC.

4.9 Promote Library and Cambodian Cyber University Network

➤ STEM Library

Perspective of STEM Library in two academic years 2024-2026

Table 8: Proposed main activities/outputs of STEM Library's perspective 2024-2026

No.	Target outputs for Library	Activities	Possible fund support
1	Library equipment and resources are upgraded	1.1 Replace basic equipment in library (needed to start the activities) 1.2 Acquisition books as reference for teaching (with the participation of ITC, 10%) 1.3 "Migrate and Improve catalog software from PMB to Koha (for reinforce collaboration with other HEIs library)" 1.4 Library Consumable (maintain useful materials for daily operation and hardware accessories)	- ARES-CCD - Others
2	Library's staff competency is enhanced	2.1 Recruit a competence staff for reference service (full time) 2.2 Building staff competency (south-south training) 2.3 Mission North-South on Open Access 2.4 Mission South-North for OA and IR 2.5 Training on the use of IR System 2.6 Mission North-South Evaluation	- ARES-CCD - Others
3	Develop the culture of open science among ITC researchers and teachers, support teachers and researchers to publish in open access	3.1 E-resource subscription 3.2 Strengthening relationship between librarians and teachers 3.3 Building staff competency (south-south training) 3.4 Create complete digital library platform 3.5 Create Open Access guideline, tutorial and policy. 3.6 Building institutional repository	- ARES-CCD - Others

➤ **Cambodian Cyber University Network (CCUN)**

In 2022, ITC supports the Directorate General of Higher Education of the Ministry of Education, Youth and Sport (DGHE/MoEYS) to prepare the concept note for the CCUN project. This project aims to improve higher education quality by using online and digital Teaching and Learning (T&L) materials. The project will connect the Higher Education Institutes (HEIs) in Cambodia through a common network infrastructure and LMS (Moodle). And through this common infrastructure and platform, Member Institutes (MIs) can share their digital content among each other's. The project will also promote the credit transfer among MIs and allow them to connect to global cyber universities network.

In the pilot phase of this project, the CCUN involves six HEIs as MIs

- 1) Institute of Technology of Cambodia (ITC)
- 2) Royal University of Phnom Penh (RUPP)
- 3) Royal University of Agriculture (RUA)
- 4) National University of Battambang (NUBB)
- 5) Svay Rieng University (SRU)
- 6) University of Heng Samrin Tbong Khmum (UHST)

With the experience ITC gained from ACU project, ITC will play a role as technical lead and support other five HEIs to development their e-learning activities.

Indicators, result outputs, and perspective of CCUN 2023-2024

Table 9: Indicators, result outputs and perspective of CCUN 2023-2024

Indicators	Result outputs	Possible fund support
<ul style="list-style-type: none"> • Number of academic programs is developed and used in CCUN • Number of e-learning contents has developed and used in CCUN • Number of students enrolled through CCUN 	<ol style="list-style-type: none"> 1. 6 universities are connected in CCUN 2. Upgrade HEIs (6) capacity on e-learning content development and operation 3. create common courses to use among HEIs (6) 4. credit transfer among HEIs (6) 5. student continue the education during COVID-19 6. connect to global/regional education network 	<ul style="list-style-type: none"> - public investment program of MoEYS
<p>Perspective of CCUN in 20232024:</p> <ul style="list-style-type: none"> • Infrastructure <ul style="list-style-type: none"> ○ Improve the capacity of CCUN infrastructure to support more users ○ Connect MIs through DPLC connection • Training <ul style="list-style-type: none"> ○ 2 training on “e-Learning Content Development” for MIs at ITC ○ 2 training on “e-Learning Content Operation” for MIs at ITC ○ 3 training on “Network Design and Administration” for MIs at ITC and at MIs base on necessity • Convert 8 courses in Computer Science into e-learning content (about 100 contents) • Operate 5 courses developed under CCUN • Support MIs in development of e-learning activities through support and monitoring mission 		

4.10 Promotion of Soft Skills

Soft skill is an essential course which promotes personal attributions that sit outside the professional qualifications and work experience. Soft skills will be mainstreamed into technician and engineering program at ITC for building students' soft capacities. Among the other skills, Team Work is one of the principle skills to be considered. 2 Trainings on Teamwork will be given to ITC students annually.

Teamwork involves building relationships and working with other people using a number of important skills and habits:

- Working cooperatively
- Contributing to groups with ideas, suggestions, and effort
- Communication (both giving and receiving)
- Sense of responsibility
- Healthy respect for different opinions, customs, and individual preferences
- Ability to participate in group decision-making

5 CHALLENGES

- Managing capacity building projects and collaborative projects requires more time and effort which need more capable administrative staffs to help.
- Limited number of classrooms compared to total enrolled students.
- Low number of available scholarships and research grants for research students, making it difficult to promote research activities and to attract outstanding students to work and study at ITC.
- Research facilities such as laboratories are not advance enough for research link with industries for product development to meet market needs.
- Promote our prototypes to commercialization

6 RECEIVING CAPACITY OF ITC

For the academic year of 2024-2025, ITC plans to recruit 1300 engineer students, and 1000 technician students based on the need of human resources and in accordance with the evolution of capacity of the Institute and increasing number of lecturers. Table below shows the current capacity of ITC.

Type of room	Quantity	Capacity
Big conference room	1	2000
Conference room	1	350
Auditorium (Building A)	2	200
Auditorium (Building F)	2	380
	11	100

Lecture and (Tutorial) TD room	70	50
Language learning room	5	25
Laboratory for student practice (TP)	91	25
Computer room (25 pc)	7	25

For practical work (TP), rooms for TP or laboratories are directly under control of each department. Table below shows the number of TP rooms in each department.

Department	Number of TP room	Capacity
DTC	3	25
GCA	12	25
GCI	8	25
GAR	4	25
GEE	13	25
GGG	8	25
GIC	11	25
GIM	10	25
GRU	7	25
GTR	5	25
GTI	2	25
AMS	8	25
Total	91	

Actually, maximum number of students in a session of lecture (C), TD and TP is presented in table below.

Department	Lecture (C)	TD	TP	Language
TC	180	50	25	50
Specialty	180	50	25	50

In the academic year of 2024-2025, estimated number of students is about **7700**. Based on group distribution, we can estimate the needs in terms of number of sessions per week and capacity of lecture, tutorial and practice rooms as following:

	Lecture (180 students)	Specialty course and TD (50 students)	TP (25 students)	Language class	Computer room
Number of sessions for technician		495	354		120
Number of sessions for engineer	140	1365	717	1508	100
Actual number of session (need)	140	1860	1071	1508	220
Number of rooms at ITC	4	70	91	5	7
Possible number of sessions for 4.5 days (36 sessions/week)	144	2520	3276	180	252
Possible number of sessions for 5 days (40 sessions/week)	160	2800	3640	200	280

This table shows that ITC still have capacity to recruit proposed number of students with this infrastructure capacity.

PART 2: PEDAGOGICAL DOCUMENT

7 PREPARATION OF ACADEMIC YEAR 2024-2025

7.1 Academic Calendar 2024-2025

The academic calendar 2024-2025 is presented in Annex 14.

7.2 Recruitment of students in 2024-2025

a) Technician students

The recruitment of Technician students is a document-based selection. Candidates shall pass or fail national examination of Bac II. Students could choose preferred department during the registration.

Only candidates (Pass national exam) with grade A to E can continue to Engineering Program after finished Technician Program.

b) Engineering students

All candidates (Pass Bac II Examination with Grade A to E) have to apply for an entrance exam. An on-site entrance exam will be organized. This examination is focused on Mathematics, Physic-Chemistry and Logic.

7.3 Proposed Tuition Fee in 2024-2025

The tuition fee for Engineering and Technician Programs is proposed as below.

<i>Engineering Program</i>	<i>Technician Program</i>
800\$ for male students 650\$ for female students	350\$ for male students 250\$ for female students

7.4 Exemption of Tuition Fee

Every year, scholarships have been provided to 1st Year students as following:

- 80 first year engineer students enrolled at ITC-Phnom Penh will be exempted from tuition fee.
- 120 first year engineer students enrolled at ITC-Tbong Khmum will be exempted from tuition fee.
- 15% of first year technician students will be exempted from tuition fee.

To comply with the criteria of Ministry of Education, Youth and Sports, this exemption will be divided into the following categories:

- Merit (best result of entrance exam): proposition 60%
- Financial difficulty: proposition 20%

- From remote areas: proposition 5%
- Female students: proposition 15%

7.5 Proposed Number of Seats for 2024-2025

i. First year student (I1)

Number of first year students to be recruited is presented in table below:

	ITC-Phnom Penh	ITC-Tbong Khmum
I1	1300	120
T1	1000	-

ii. Third year of Engineering Program (I2 → I3)

The following table shows number of seats in the 3rd year (I3) in each department for academic year of 2024-2025.

Number of seats from I2 to I3

Faculty/Department	I2 to I3
GCA	180
GCI	200
GAR	80
GEE	150
GGG	80
GIC	90
GIM	110
GRU	90
GTR	70
GTI	60
AMS	80
Total	1190

iii. Possibility of enrolment to I3 for Technician Graduates

For the academic year of 2024-2025, 15% of T2 Graduates can enter to 3rd Year of Engineering Program if they passed a test on three subjects (mathematics, physics and foreign language) which conforms to the 2nd Year Engineering Program (I2) and an interview by relevant departments.

To ensure that students graduated from two-year technician program will be able to continue their studies in 3rd year of engineering program, ITC will organize an intensive preparation course in the three subjects (mathematics, physics and foreign language) during summer holidays. This intensive course is paying.

iv. Others exams to I3

2 seats per department for Cambodian students having a level of BAC+2 and a good knowledge of foreign language or having a bachelor of science, and who will pass the tests of specific exam (written tests: math and physics and interviewed by the concerned department) in September.

v. Total seats to I3 in 2024-2025

The following table summarizes, for each department, total number of seats to I3 in 2024-2025.

Department	Seat I2 to I3	Seat T2 to I3	Seat External	TOTAL
GCA	180	15	2	197
GCI	200	17	2	219
GAR	80	-	-	80
GEE	150	15	2	167
GGG	80	-	-	80
GIC	90	-	-	90
GIM	110	6	2	118
GRU	90	-	-	90
GTR	70	3	-	73
GTI	60	-	-	60
AMS	80	-	-	80
Total	1190	56	8	1254

8 NOMINATION OF ITC DIRECTION BOARD FOR 2024-2025

The 32nd Board of Trustees propose to nominate the Direction Board of ITC for academic year 2024-2025 as following:

ANNEXES

Annex 1

Detail of establishment of Associate Degree “IT Network and Programming (competency-based)” – 2 Years Program under department GIC

1. BACKGROUND

Under the Workforce Development Project for Skills for Future Economic supported by the bank of ADB, GIC is going to open the Associate’s Degree Program in IT Network and Programming (expected) in 2024 base on the project implementation timeline. The program is designed as a competency-based by the consultant of ADB, which means learner can take some course/competency instead of taking the whole diploma program. This will provide GIC the opportunities to operate the course/competency as vocational training.

2. PROGRAM OBJECTIVE

This program equips students with the skills to excel as network technicians, proficiently manage and maintain networks, and adeptly develop front-end websites. Upon completion, graduates will demonstrate the following competencies:

- Know how to design and set up a network in an organization
- Manage and monitor network traffic
- Know how to troubleshoot a network problem
- Create a website for the institution

3. CURRICULUM

Below table show the course structure of the associate’s degree program in IT Network and Programming.

Subject	Competency Type	Code	Hours				Credit
			C	TD	TP	Total	
Semester 1			160	0	384	544	22
Computer Architecture	Core	ITNP1CA	32	0	96	128	5
Basic Computer Literacy	Core	ITNP1BCL	32	0	96	128	5
Windows Client	Core	ITNP1WC	32	0	96	128	5
Web Client Programming	Core	ITNP1WCP	32	0	96	128	5
Workplace Communication Skills	Basic	ITNP1CA	32	0	0	32	2
Semester 2			160	0	352	512	21

Network Administration	Core	ITNP2NA	32	0	96	128	5
System Administration	Core	ITNP2SA	32	0	96	128	5
Network Design	Core	ITNP2ND	32	0	96	128	5
Network and Information Security	Core	ITNP2NIS	32	0	64	96	4
Workplace Problem Solving Techniques	Basic	ITNP2WPST	32	0	0	32	2
Semester 3			128	0	64	192	12
Introduction to 4IR	Core	ITNP34IR	32	0	64	96	4
Math Discrete	Basic	ITNP3MD	16	0	0	16	1
Soft Skills	Basic	ITNP3SS	32	0	0	32	2
Environmental Sustainability Measures	Basic	ITNP3ESM	16	0	0	16	1
Business Concept	Basic	ITNP3BC	32	0	0	32	2
Year 1 internship	Core	ITNP3INT					2
Semester 4			0	0	0	0	9
Final year internship	Core	ITNP4INT					9
Total			448	0	800	1248	64

Annex 2

Detail of establishment of Associate' Degree "Industrial Engineering" – CBT, 2 Years Program under department GIM

1. BACKGROUND

The Department of Industrial and Mechanical Engineering (GIM) propose to launch a new Associate's Degree program in Industrial Engineering. This program is being established under the Skills for Future Economy (SFE) project, an ADB-support initiative aimed at developing Cambodia's workforce for the modern economy. The SFE project recognizes Industrial Engineering as a crucial skill area, and GIM, classified as a Group-A institute, is well-positioned to take the lead in delivering this program. With its existing experience in competency-based training (CBT), GIM will not only offer this new program but also guide and support Group-B institutes, such as Kandal and Kampong Speu Polytechnics, in implementing their own programs.

Building upon the success of the S4C project, which introduced CBT to GIM in 2019, the new Industrial Engineering program will leverage this effective teaching model to bridge the skills gap and prepare graduates for immediate contributions in the workforce. Furthermore, the SFE project will provide resources for faculty development, advanced training equipment, and facility upgrades, ensuring a comprehensive and high-quality learning experience for our students.

2. PROGRAM OBJECTIVE

This program equips graduates with the following core competencies to excel in various industrial settings:

- **Hands-on Technical Skills:** Graduates will gain proficiency in operating and maintaining common machines and utility equipment, fostering a strong foundation in practical applications.
- **Automation Fundamentals:** The program introduces students to the principles of low-cost automation systems, preparing them to contribute to the efficiency and productivity of manufacturing and processing industries.
- **Quality Assurance Expertise:** Graduates will develop a comprehensive understanding of quality planning, control, and assurance practices, enabling them to maintain consistently high standards within industrial environments.
- **Process Improvement Techniques:** The program equips students with the knowledge of Lean methodologies (including 5S and Muda-dori), Six Sigma, and Kaizen, empowering them to optimize processes and eliminate waste.
- **Sustainable Practices:** Graduates will learn to conduct energy audits and implement effective energy management strategies, contributing to environmental sustainability.
- **Operational Efficiency Management:** The program covers the fundamentals of work facility layout, inventory control, and material handling systems, allowing graduates to optimize industrial operations for efficiency.

- **Safe Work Environment:** Students will gain a strong understanding of industrial ergonomics and workplace safety principles, enabling them to contribute to creating a safe and healthy work environment.
- **Maintenance Expertise:** The program equips graduates with the ability to perform and manage maintenance tasks for industrial utilities and machinery, ensuring smooth operation and minimizing downtime.
- **Emerging Technologies:** Graduates will gain a foundational understanding of Artificial Intelligence (AI) applications in industrial engineering, including Human-Machine Interface (HMI) systems, decision support systems, and information management technologies, preparing them for the future of industrial practices.

By mastering these competencies, graduates of this program will be well-positioned for successful careers in various industrial sectors, contributing to increased efficiency, quality, and innovation within the workforce.

3. CURRICULUM

Below table show the course structure of the associate's degree program in Industrial Engineering

Module	Number of hours				Number of Credits				
	Semester:	IA	IIA	IB	IIB	Lecture	Exercise	Practice	TOTAL
Apply Mathematical Calculations for Industrial Engineering	48					1	1	0	2
Supervise Application of Basic Computer Software Such as Ms Office and E-mail	48					1	0	1	2
Perform operations and processes on common machines and utilities machines	144					3	0	3	6
Plan and apply industrial ergonomics and workplace health and safety measures	96					2	0	2	4
Plan and implement green measures and techniques at workplace	48					1	0	1	2
Apply Communication and Team Building Skills in Workplace		32				2	0	0	2
Apply quality planning, control and assurance in industry		128				2	0	3	5
Apply and monitor data collection and analysis in conformance to 4IR		64				2	0	1	3
Understand AI for industrial engineering through HMI, decision support and information systems		128				2	0	3	5
Perform energy audit and apply energy management		64				2	0	1	3

Internship Report			96					2
Apply basic concepts of Lean/ 6 Sigma/ Kaizen/ 5S and Muda-dori			96		2	0	2	4
Apply basic concepts of low- cost automations systems in manufacturing and process industries			96		2	0	2	4
Perform and manage maintenance of plant utilities and machinery			112		3	0	2	5
Understand work facilities, layout, inventory and material handling system for efficient operations			112		3	0	2	5
Final Year Internship				384				9
Total per semester	384	416	512	384	28	1	23	63
Total Hours	800		896		1696			

4. HUMAN RESOURCES, TRAINING FACILITY AND EQUIPMENT

In our department, we currently have a total of 36 faculty members, including 33 lecturers and 3 support staff members. Among the lecturers, 7 hold Ph.D. degrees, while the others hold Master's degrees. The faculty members involved in the new associate's degree program are listed in the table below:

No.	Name	Qualification	University and Country of Graduation	Year of Graduation
1	CHAN Sarin	Ph.D	Bandung Institute of Technology, (Indonesia), and Keio University (Japan)	2011
2	CHHITH Saosometh	Ph.D	Ghent University (Belgium)	2017
3	KRUY Sothea	Ph.D	Keio University (Japan)	2015
4	SEANG Chansopheak	Ph.D	INSA de Rennes (France)	2013
5	SAR Sambo	Master	Université Libre de Bruxelles (Belgium)	2004
6	PHUOY Lyheng	Master	Changmai University (Thailand)	2015

7	SENG Piseth	Master	University of Malaya (Malaysia)	2013
8	SAN Sophak	Master	Bandung Institute of Technology (Indonesia)	2017
9	PICH Yanghav	Master	Institute of Technology of Cambodia	2018
10	HEANG Latin	Master	Institute of Technology of Cambodia	2020
11	KEO Chivorn	Master	Institute of Technology of Cambodia	2020
12	LY Leangchheng	Master	Institute of Technology of Cambodia	2020
13	SREY Sokserey	Master	Institute of Technology of Cambodia	2023

Annex 3

Detail of establishment of new program namely “Associate Degree in Geotechnical Engineering” under Faculty of Geo-resources and Geotechnical Engineering

1. BACKGROUND

Department of Geo-resources and Geotechnical Engineering was established in late 2011 to response for urgent needs for management and development of the resource’s sustainability of minerals and petroleum in Cambodia. According to Prokas No. 726 of Ministry of Education Youth and Sports, Department of Geo-resources and Geotechnical Engineering has upgraded to Faculty of Geo-resources and Geotechnical Engineering, consisting of two departments, Department of Geo-resources and Geotechnical Engineering, and Department of Petroleum Engineering. However, due to narrow of job market in the field of petroleum, the Faculty of Geo-resources and Geotechnical Engineering has been implementing only one engineering program – Program of Geo-resources and Geotechnical Engineering with multidisciplinary fields, such as mining, petroleum, and geotechnical engineering.

In response to the current urgent need of human resources for engineers and associate degrees in geotechnical engineering, which is experiencing significant growth, there is a rising demand for skilled professionals in the field. The construction and real estate sectors are expanding, contributing to the increased demand. Over the past decade (2009 -2019), Cambodia has seen a 7.1% GDP growth, with 2% increase in construction and real estate, as reported by World Bank, resulting in the creation of 220,000 jobs. In 2022, Cambodia’s GDP grew by about 5.5% and an estimated growth rate of 6.6% is expected in 2023. Geotechnical engineers and technicians play a crucial role not only in construction companies but also in mining industries, supporting activities such as soil investigation, tunnelling, retaining wall, surface, and underground mining.

Establishing an associate degree program in geotechnical engineering will help prepare individuals for these specific roles and ensure they have the relevant knowledge and skills required by the industry. Moreover, the establishment of the associate degree program aligns with the institution's vision and supports national development goals, such as the Rectangular Strategy Phase 4 of the Royal Government. By providing quality education and producing skilled graduates in geotechnical engineering, the program contributes to the growth of employment, equity, and efficiency, which are vital for the overall development of Cambodia. The faculty aims to enhance educational opportunities for students interested in geotechnical engineering by offering a structured curriculum that covers foundational principles and practical skills in the field. This program can serve as a stepping stone for those who choose to pursue further education or enter the workforce directly after completing the associate degree. Therefore, the faculty proposes the establishment of an 'Associate Degree in Geotechnical Engineering'."

2. PROGRAM OF GEOTECHNICAL ENGINEERING ASSOCIATE DEGREE

- Name in French: DUT Génie Géotechniques
- Name in Khmer: បរិញ្ញាបត្ររងទេព្យកោសល្យគ្រឹះភូគព្ភសាស្ត្រ

2.1. Program Education Objectives (PEOs)

The program of Associate Degree in Geotechnical Engineering is 2 -years program under faculty of Geo-resources and Geotechnical Engineering at Institute of Technology of Cambodia. It aims to prepares students for lifelong careers as skilled and productive technicians who can adapt to new situations and emerging programs while maintaining a high level of awareness of ethical, social and environmental concerns. Upon graduation, within two years, students will be able to:

PEO1: Acquiring foundational knowledge and practical skills in Geotechnical Engineering-related areas such as Shallow and Deep Foundation Design, Earth Structure Analysis, and Soil/Rock Slope Stability for entry-level positions in the field.

PEO2: Developing essential soft skills including teamwork, problem-solving, and communication to effectively collaborate in engineering projects and contribute to team efforts.

PEO3: Cultivating a commitment to continuous learning and professional development to adapt to evolving technologies and industry practices.

PEO4: Emphasizing ethical conduct, responsibility, and awareness of societal implications of engineering decisions, promoting integrity and service-oriented values in engineering practice at the technician level.

2.2. Program Learning Outcomes (PLOs)

Associate Degree program of Geotechnical Engineering under Faculty of Geo-resources and Geotechnical Engineering at ITC aims to instill in our graduates the following attributes:

A – KNOWLEDGE

PLO1: Apply foundational engineering knowledge, mathematics, and basic science principles in practical applications within the field of Geotechnical Engineering.

PLO2: Perform basic experimental procedures, analyze data, and interpret results relevant to Geotechnical Engineering.

B – COGNITIVE SKILLS

PLO3: Investigate and analyze simple engineering problems in Geotechnical Engineering using established methodologies and basic research skills.

PLO4: Apply basic critical thinking skills to identify and solve straightforward engineering problems.

C – INTERPERSONAL SKILLS AND RESPONSIBILITY

PLO5: Demonstrate professionalism and ethical behavior in engineering practice at the technician level.

PLO6: Collaborate effectively in small-scale engineering projects within a team environment.

PLO7: Engage in professional development activities and demonstrate a commitment to lifelong learning.

D – NUMERICAL SKILLS, INFORMATION TECHNOLOGY, AND COMMUNICATION

PLO8: Communicate technical information effectively through written reports and oral presentations.

PLO9: Utilize basic numerical and information technology skills to support engineering tasks.

E – PSYCHOMOTOR SKILLS

PLO10: Apply fundamental techniques and resources for basic product development and engineering tasks.

2.3. Course hours and credits

For each semester of 1st year and 2nd year, students will be required to take 4 to 5 courses to fulfill 15 to 18 credits which equivalent to 384 hours or almost the same number of hours of studying. Total credits for the program are required about 66 credits (including final year project which is 18 credits) equivalent to 1408 class hours in total.

The credit to be equivalent with teaching hour as follows:

- 16 hours of teaching course (C) = 1 credit
- 32 hours of tutorial (TD) = 1 credit
- 32 hours of laboratory practice (TP) = 1 credit

2.4. Curriculum of the program

This curriculum is designed for associate degree which illustrate the whole two years **Geotechnical Engineering Associate Degree Program** in Faculty of Geo-resources and Geotechnical Engineering from 1st year to 2nd year.

The curriculum of Geotechnical Engineering in academic year 2024-2025

Curriculum for 1st year (T1) semester 1:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	Computer Aides Drawing (CAD)					64	64	2
2	Engineering Geology			32	16		48	2.5
3	Hydrogeology			32	16		48	2.5
4	Soil Mechanics			48		64	112	5
5	Rock Mechanics			32		32	64	3
Total for 1st semester T1				144	32	160	336	15

Curriculum for 1st year (T1) semester 2:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	Construction Materials			32		64	96	4
2	In-situ Geotechnical Investigation			32		32	64	3
3	Shallow Foundation			48	32		80	4
4	Geodesy and Surveying			64		64	128	6
Total for 2nd semester T1				176	32	160	368	17

Curriculum for 2nd year (T2) semester 1:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	Deep Foundation			48	32		80	4
2	Slope Stability Analysis & Earth Retaining Structure			48	32		80	4
3	Deep Excavation			48	32		80	4
4	Project Management, Work Safety and Ethics			48	32		80	4
Total for 1st semester T2				192	128	0	320	16

Curriculum for 2nd year (T2) semester 2:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
	Final Internship						384	18
Total for 2nd semester T2							384	18

2.5. Human Resources

Faculty of Geo-resources and Geotechnical Engineering has sufficient human resources with master and PhD holders in the field of Geo-resources and Petroleum Engineering, who were graduated from Japan, Thailand, Indonesia, Malaysia, Australia, Cambodia (Table 1.2). Based on the number of staff and strategy plan of faculty staffs, GGG will be capable to run new associate degree program of Geotechnical Engineering.

Human resources of Program of Geotechnical Engineering

No.	Name	Degree	University	Graduated
1	Eng Chandoeun	PhD	Kyushu University	2018

2	Pech Sopheap	PhD	Institute of Technology of Cambodia	2023
3	Pich Bunchoeun	PhD	Hokkaido University	2010
4	Hong Vuthy	PhD	Hokkaido University	2010
5	Por Sopheap	PhD	Chulalongkorn University	2015
6	Boeut Sophea	PhD	Hokkaido University	2020
7	Sreu Tola	PhD	Kyushu University	2022
8	Seang Sirisokha	PhD	Kyushu University	2019
9	Kret Kakda	PhD	Kyushu University	2019
10	Mao Pisith	PhD	Kyushu University	2020
11	Vamoeurn Nimol	Master	The University of Melbourne	2000
12	Kaing Sainglong	Master	Asian Institute of Technology	2015
13	Kong Sotheara	Master	University of the Philippines Diliman	2023
14	Hong Pisith	Master	Tokai University	2020
15	Chea Monyneath	Master	Nagaoka University of Technology	2022
16	Seng Mengly	Master	Chulalongkorn University	2021
17	Sreng Laymey	Master	Institute of Technology of Cambodia	2022
18	Heng Ratha	Master	Institute of Technology of Cambodia	2022

2.6. Laboratory Facilities

The faculty has 7 laboratories for supporting the research and practical class works for both engineer and associate degrees programs are shown below:

Laboratory facilities and function for program at GGG

No	Name of Laboratory	Equipment	Function
1	Sample Preparation	<ul style="list-style-type: none"> - Large Scale Cutting Machine - Small Scale Cutting Machine - Precision Cutting Machine - Rock Polishing Iron Plate - Rock Polishing Glass Plate - Electric Hot Plate - Mineral Separating Machine - Stainless Mortar - Iron Motar - Ultrasonic Cleaner - Diamond Polishing machine (Big) - Diamond Polishing machine (small) - Centrifuges with rotor (Pro-Analytical) - Electric Balance - Hand Auger Equipment 	<ul style="list-style-type: none"> - Cutting, polishing, and preparing rock and soil samples - Experiment on mineral processing - Experiment on liquid and solid separating of minerals
2	X-Ray	<ul style="list-style-type: none"> - X-Ray Diffraction (XRD) - X-Ray Fluorescence (XRF) 	Minerals and chemical characterization
3	Petroleum	<ul style="list-style-type: none"> - Instructional Gravimetric Capillary Pressure System - Bench Top Liquid Permeability Measurement System - Floor Stand Manual Drill Press - Instructional Gas Permeameter - Instructional Helium Porosimeter - Univeral Strength Testing - Pressure Valum Temperature apparatus - Viscometer - Densitymeter - Gasometer - Stirrer - High precious digital scale 	Petroleum exploration, oil and gas reservoir characterization, rock and soil properties analysis
4	Geotechnics	<ul style="list-style-type: none"> - Electric Furnace - Electrical Oven - Micro-Deval Apparatus - Unconfined Compression Tester - Hydrometer Analyzer - Liquid Limit Apparatus (Cassagrand) - Stirrer (Oriental Motor) - Extruder - Electric Balance Big size - Agate Motar, small, medium, and large sizes - Direct shear 	To support geotechnical and geo-resources investigation

		<ul style="list-style-type: none"> - Unconfined compression test apparatus - Point Load Index test apparatus for rock - Oil rotary vacuum pump - Sieve and small ball mil 	
5	Microscope	<ul style="list-style-type: none"> - Binocular Polarizing Metallurgical Microscope - Trinocular Polarizing Metallurgical Microscope - Heating/Freezing Stage Apparatus (Fluid Inclusion) 	Minerals characterization
6	Nanostructure and Chemical analysis	<ul style="list-style-type: none"> - MP-AES - SEM/EDS - UV-vis 	Chemical and morphology analysis
7	Exploration Geophysics	<ul style="list-style-type: none"> - Magnetometer - Two Seismograph -48channels - Four workstations and one mobile workstation 	Geo-resources and geotechnical exploration

Annex 4

Detail of Proposed Modification of Engineering Program Curriculum of Civil Engineering Department

1. BACKGROUND

Civil Engineering Department (GCI) of Civil Engineering Faculty (FGC) is the eldest department among three departments of the faculty. The other two departments included Architectural Engineering Department (GAR) and Infrastructure and Transports Engineering Department (GTI). Our mission is to promote the quality of sciences and technology education in the field of civil engineering to the regional and international level. Based on our mission, our program curriculum is one crucial key which required continuous attention to check and revise when necessary.

2. PROPOSED MODIFICATION OF CURRICULUM OF CIVIL ENGINEERING PROGRAM

For the academic year 2024-2025, the engineering program curriculum of the Civil Engineering Department is requested for a modification. The modification includes shifting the courses between semesters and reducing the credit number of a course in compensating to add in another course. The summary of the proposed modification is shown in Table 1.

Table 1: Summary of proposed modification of the curriculum of GCI for fiscal year 2024-2025

Gr	No.	Name of course	Current Situation				Proposed modification			
			C	TD	TP	Credit	C	TD	TP	Credit
I3GCI-S1	1	Hydrology	32	0	0	2	Shift to 3 rd year, semester 2			
	2	Geology	In 3 rd year, semester 2				16	0	0	1
	3	Heat in Building	In 3 rd year, semester 2				16	0	0	1
I3GCI-S2	1	Hydrology	In 3 rd year, semester 1				32	0	0	2
	2	Geology	16	0	0	1	Shift to 3 rd year, semester 1			
	3	Heat in Building	16	0	0	1	Shift to 3 rd year, semester 1			
I4GCI-S2	1	Soil mechanics II	32	32	0	3	16	16	0	1.5
	2	Finite Element Method	None				16	0	16	1.5

3. CURRICULUM OF ENGINEERING PROGRAM OF CIVIL ENGINEERING DEPARTMENT

The proposed program curriculum for engineering degree of civil engineering in the academic year 2024-2025 is shown in Table 2.

Table 2: Program Curriculum of Civil Engineering

Curriculum for 3rd year (I3GCI) semester 1:

No.	Name of subject	Code	Instructor	Cours	TD	TP	Total	Credit
1	English I	GCI31LAN				32	32	1
2	French I	GCI31LFR				64	64	2
3	AutoCAD	GCI31AUC	MEY Dina			32	32	1
4	Geology	GCI32GEO	HENG Ratha	16			16	1
5	Heat in Building	GCI32THB	LEU Leanghong	16			16	1
6	Fluid Mechanics	GCI31MDF	POUV Keang Se	32			32	2
7	Continuum Mechanics	GCI31MSF	OUCV Vanthet	16	16		32	1.5
8	Strength of Materials I	GCI3RDM	RATH Sovann Sathya	16	32		48	2
9	Statistics	GCI31STA		16	32		48	2
10	Surveying	GCI31TOP	OENG Thaileng	32		32	64	3
Total for 1st semester I3GCI				144	80	160	384	16.5

Curriculum for 3rd year (I3GCI) semester 2:

No.	Name of subject	Code	Instructor	Cours	TD	TP	Total	Credit
1	English II	GCI32LAN				64	64	2
2	French II	GCI32LFR				32	32	1
3	Architecture	GCI32ARC	VENH Lay Ou	16	32		48	2
4	Electricity in Building	GCI32EDB	BUN Seang	16			16	1
5	Electrotechnics	GCI32ELT	BUN Seang	16			16	1
6	Construction Materials (Concrete)	GCI32MDCB	HENG Sounean	16		16	32	1.5
7	Construction Materials (steel)	GCI32MDCA	LY Hav	16			16	1
8	Informatics (MATLAB)	GCI32MAT	POUV Keang Sé	16		16	32	1.5

9	Strength of Materials II	GCI32RDM	RATH Sovann Sathya	16	32	0	48	2
10	Hydrology	GCI31HYL	ANN Vannak	32			32	2
11	Building Construction Technology	GCI32TDB	PROK Narith	16	32		48	2
Total for 2nd semester I3GCI				160	96	128	384	17

Curriculum for 4th year (I4GCI) semester 1:

No.	Name of subject	Code	Instructor	Cour s	TD	TP	Total	Credit
1	English I	GCI41LAN				32	32	1
2	French I	GCI41LFR				32	32	1
3	Structural analysis I	GCI41ADS	VONG Seng	32			32	2
4	Reinforced Concrete I	GCI41BEA	LIM Sovanvichet	16	32		48	2
5	Engine in construction site	GCI41EDC	OUCH Vanthet	16			16	1
6	Steel design and construction I	GCI41COM	LY Hav	32			32	2
7	Plumbing System and Sanitary Equipment	GCI41INS	CHHANG Sophy	32			32	2
8	Soil Mechanics I	GCI41MDS	KY Sambath	32	16	16	64	3
9	Road Design and Construction I	GCI41ROU	POUV Keang Se	48			48	3
10	Safety in construction site	GCI41SEC	LIM Sovanvichet	16			16	1
11	Construction site technology	GCI41TDC	CHHANG Sophy	16			16	1
12	External Works	GCI41VRD	OENG Thaileng	16			16	1
13	Internship Report	GCI32RDS						2
Total for 1st semester I4GCI				256	48	80	384	22

Curriculum for 4th year (I4GCI) semester 2:

No.	Name of subject	Code	Instructor	Cours	TD	TP	Total	Credit
1	English II	GCI42LAN				32	32	1
2	French II	GCI42LFR				32	32	1
3	Structural analysis II	GCI42ADS	VONG Seng	16	32		48	2
4	Reinforced concrete II	GCI42BEA	LIM sovanvichet	16	32		48	2
5	Prestressed concrete I	GCI42BPR	CHEA Savuth	32			32	2
6	Structural Wood design and construction	GCI42COB	KAN Kuchvichea	16	32		48	2
7	Steel design and construction II	GCI42COM	LY Hav	16	32		48	2
8	Soil mechanics II	GCI42MDS	KY Sambath	16	16		32	1.5
9	Road design and construction II	GCI42ROU	KAN Kuchvichea		16	16	32	1
10	Finite Element Method	GCI42MEF	LIM Sovanvichet	16		16	32	1.5
Total for 2nd semester I4GCI				128	160	96	384	16

Curriculum for 5th year (I5GCI) semester 1:

No.	Name of subject	Code	Instructor	Cours	TD	TP	Total	Credit
1	English	GCI51LAN				32	32	1
2	French	GCI51LFR				32	32	1
3	Prestressed Concrete II	GCI51BPR	CHEA Savuth	16	32		48	2
4	Structural Design by Computer Aids	GCI51CDS	CHREA Rada	16	32		48	2
5	Construction Law	GCI51DRO	MEY Dina	32			32	2
6	Contract	GCI51MAR	HIN Raveth	16			16	1
7	Quantity estimation	GCI51MET	HIN Raveth	32			32	2
8	Planning	GCI51PLA	MAO Kunthea	16	16		32	1.5

9	Bridge Design and Construction	GCI51PON	KAING Sao Serey	48	32		80	4
10	Conception of Earthquakes	GCI51CTT	PROK Narith	32			32	2
Total for 1st semester I5GCI				208	112	64	384	18.5

Curriculum for 5th year (I5GCI) semester 2:

No.	Name of subject	Code	Instructor	Cour s	TD	TP	Total	Credit
1	Final Year Internship	GCI52SFE					384	9
Total for 2nd semester I5GCI							384	9

Annex 5

Detail of proposed modification of Transport and Infrastructure Engineering program of Faculty of Civil Engineering

1. BACKGROUND

Transport sector plays a very important role for the overall economic growth of a society. It integrates mobility of people and goods at both domestic and international levels (e.g., transport by roads, railway, maritime, river, and air transport networks). The continuous population growth and their daily activities pose significant challenges to the development of transport systems and infrastructures in many countries, including Cambodia. Particularly, the number of qualified people with specialization in the transport and infrastructure related fields remains quite limited to respond to Cambodia's development. This is due to the fact that there is very little educational training program in these fields. Certain existing courses related to buildings and public works are often included in civil engineering program.

2. NAME OF THIS PROGRAM

- Name in French: Génie des Transports et des Infrastructures
- Name in English: Transport and Infrastructure Engineering
- Name in Khmer: ដេប៉ាតឺម៉ង់ទេពកោសល្យហេដ្ឋារចនាសម្ព័ន្ធ និងដឹកជញ្ជូន

3. OBJECTIVE OF THIS PROGRAM

This program was launched in 2022, for the first time in Cambodia, to educate more specialists and qualified engineers in respond to needed human resources in the fields of transport and infrastructure engineering. It allows students to acquire specific technical skills such as the study on road traffic, the design of construction plans, planning, construction techniques, maintenance and repair of infrastructure, management of goods flows, etc. After their studies, students can work either in design offices, on construction sites, or in administration responsible for different tasks related to transport and logistics and with different responsibilities. They also have the opportunity to continue their studies at higher degrees, including master and doctoral degrees.

4. PROPOSED UPDATED CURRICULUM OF THIS PROGRAM

In response to the current job markets and digital society transformation, the curriculum of this program “Transport and Infrastructure Engineering” should be updated accordingly. We propose to slightly modify 3 courses as shown in Table 1. Table 2 shows the full curriculum of Transport and Infrastructure Engineering program at Institute of Technology of Cambodia, after this update.

Table 1: Proposed Updated Course Items in the Transport and Infrastructure Engineering Program

No.	Year/ Semester	Previous Course	Revised Course	Descriptions
1	GTI-I3-S2	Management of Supply Chains and transport systems	Management of Supply Chains	-We revised the name of this course, by deleting the term "and Transport Systems" -The terms "Transport Systems" is already included in other course "Transport Systems of Freights and Travelers"
2	GTI-I4-S2	Management of stocks and supplies	Digital Technologies for Transport and Infrastructure	-Previous course is similar to other course "Management of Supply Chains" in GTI-I3-S2, so we replaced this course with new course "Digital Technologies for Transport and Infrastructure" -This new course is 2-credit (32 h coursework) -This new course is designed corresponding to the current job market and the national pentagon strategy (about digital society)
3	GTI-I5-S1	Underground structures	Underground structures	-We slightly adjusted the TD duration, from 32h to 16h. -The remaining 16h is added to the new course "Digital Technologies for Transport and Infrastructure" in GTI-I4-S2.

Table 2: Updated Curriculum of Transport and Infrastructure Engineering Program

No.	Course Name	C	TD	TP	Credit
GTI-I3-S1					
1	English			32	1
2	French			64	2
3	C.A.D. 1 (AutoCAD)	16		32	2
4	Strength of Materials 1	16	32		2
5	Statistics	32	32		3
6	Surveying	32		32	3
7	Choice of Transport Infrastructures and Sustainability	16			1
8	Life Cycle Analysis	16			1
9	Transport Economies	16			1
10	Fundamental Notions of Logistics	16			1
	Sub-total	160	64	160	17
GTI-I3-S2					
1	English			64	2
2	French			32	1
3	Geology	16			1
4	Hydrology	32			2
5	Construction Materials (concrete)	16		16	1.5
6	Strength of Materials 2	16	32		2
7	Transport Engineering	32			2
8	Traffic Management and Modelling	32			2
9	Transport Systems of Freights and Travelers	16	16		1.5

No.	Course Name	C	TD	TP	Credit
10	Cross-Border and Road Transport	16	16		1.5
11	Management of supply chains and transport systems Management of supply chains	16	16		1.5
12	Final year internship				2
	Sub-total	192	80	112	20
GTI-I4-S1					
1	English			32	1
2	French			32	1
3	Structural analysis for construction and public works 1	32			2
4	Reinforced concrete	32	32		3
5	Steel design and construction	16	32		2
6	Soil mechanics 1	32	16	16	3
7	Road design 1	48			3
8	Urban drainage system	32			2
9	Air transport	32			2
	Sub-total	224	80	80	19
GTI-I4-S2					
1	English			32	1
2	French			32	1
3	Structural analysis for construction and public works 2	16	32		2
4	Pre-stressed concrete	16	32		2
5	Soil mechanics 2	16	32		2
6	Road design 2	16	16	16	2
7	Site management	32			2
8	C.A.D. 2 (Civil 3D)	16			1
9	Maritime ports	16	32		2
10	Management of Stocks and Supplies Digital Technologies for Transport and Infrastructure	16 32	16		1.5 2
	Sub-total	160	144	80	17
GTI-I5-S1					
1	English			32	1
2	French			32	1
3	Calculation of structures (Plaxis 2D)	16	32		2
4	Laws	32			2
5	Marketing	16			1
6	Cost and quantity estimation	32			2
7	Planning	16	16		1.5
8	Bridge design	48	32		4
9	Railways	32			2
10	Underground structures	16	32 16		1.5
	Sub-total	208	96	64	18
GTI-I5-S2					
1	Final year internship				9

No.	Course Name	C	TD	TP	Credit
	Sub-total	0	0	0	9

Total	944	464	496	100
	C	TD	TP	Credit

Note: C: Lecture (1 credit = 16 hours); TD: Exercise (1 credit = 32 hours); TP: Practice (1 credit = 32 hours)

Annex 6

Detail of proposed modification of Geo-resources and Geotechnical program of Faculty of Geo-resources and Geotechnical Engineering

1. BACKGROUND

Program of Geo-resources and Geotechnical Engineering at Faculty of Geo-resources and Geotechnical Engineering has implemented since the establishment of the department in late 2011. The primary objective of the program is to provide undergraduate students with multidisciplinary skills and knowledge in the fields of economic geology, petroleum and geotechnical engineering. In addition to the technical knowledge, the program also emphasizes the development of professional skills and ethical awareness. Students are provided with knowledge and training in engineering ethics, work safety practices, environmental impact assessment, and decision-making processes. These skills are crucial for students to navigate real-world challenges and make informed decisions that consider the ethical, social, and environmental implications of their work.

Recognizing the high demand for professional geotechnical engineers, particularly in the areas of foundation and slope stability design in various industries, the faculty proposes to modify the courses in the 5th-year program. This modification aims to ensure that the program stays up-to-date with the latest developments in the field of geotechnical engineering. By incorporating the most relevant and current knowledge and skills into the curriculum, the faculty ensures that graduates are well-prepared to meet the industry's demands and excel in their careers. The proposed modifications in the courses enable students to gain a deeper understanding of advanced topics related to foundation and slope stability design. It allows students to explore emerging technologies, industry best practices, and the latest research findings in these areas. By staying up-to-date with the field's advancements, students can develop the necessary expertise and proficiency to address the complex challenges associated with geotechnical engineering in the industry.

2. PROPOSE MODIFICATION OF THE CURRICULUM OF GEO-RESOURCES AND GEOTECHNICAL ENGINEERING PROGRAM

For the upcoming academic year, the program of Geo-resources and Geotechnical Engineering requested to modify 4 courses in total, in which 1 course modified name, 1 course is removed, 1 course is modified the duration, and 1 course is a new course.

Table 1: Summary of proposed modification of 4 courses in Geo-resources and Geotechnical Program

Gr	No.	Name of course	Current Situation				New Proposal			
			C	TD	TP	Credit	C	TD	TP	Credit
I5GGG-S1	1	French	0	0	32	1	0	0	32	1
	2	English	0	0	32	1	0	0	32	1
	3	Foundation Engineering II	16	16	0	1.5	32	16	0	2.5
	4	Fundamental of Petroleum Engineering	48	0	0	3	48	0	0	3
	5	Mineral Processing	16	0	32	2	16	0	32	2
	6	Exploitation of Gravel, Sand, and Clay	32	0	0	2	Delete			
	7	Research Methodology	New				16	0	0	1
	8	Oil and Gas Resources Development	48	0	0	3	48	0	0	3
	9	Mining Project Management (Modified name from Mining Project) Management)	32	0	0	2	32	0	0	2
	10	Economics and Management of Mineral Resources	32	0	0	2	32	0	0	2
	11	Geo-environment	32	0	0	2	32	0	0	2
	12	Work Safety and Ethics	16	0	0	1	16	0	0	1
	13	Internship Report	0	0	0	2	0	0	0	2

3. CURRICULUM OF THE MODIFIED PROGRAM

This curriculum is designed for an engineering degree that illustrates the whole three years program at Faculty of Geo-resources and Geotechnical Engineering from 3rd -year to 5th – year.

The curriculum of the Geo-resources and Geotechnical Program in the academic year 2024 -2024 is shown below:

Table 2: Curriculum for 3rd year (I3) semester 1:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French			0	0	64	64	2
2	English			0	0	32	32	1
3	Statistics			16	32	0	48	2
4	Geodesy and Topology			32	0	32	64	3
5	Geochemistry			32	0	0	32	2
6	General Geology of Geology of Cambodia			32	0	0	32	2
7	Mechanic of Materials			32	0	0	32	2
8	Computer Aides Drawing (CAD)			0	0	32	32	1
9	Structural Geology			32	0	0	32	2
10	General Electronics			16	0	0	16	1
Total for 1st semester I3				192	32	160	384	18

Table 3: Curriculum for 3rd year (I3) semester 2:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French			0	0	32	32	1
2	English			0	0	64	64	2
3	Petrology and Mineralogy			16	0	48	64	2.5

4	Sedimentology			32	0	0	32	2
5	Mineral Deposits			48	0	0	48	3
6	Principles of Geographic Information Systems			16	0	32	48	2
7	Geostatistics			32	0	0	32	2
8	Soil Mechanics			32	0	32	64	3
9	Fluid Mechanics			32	0	0	32	2
Total for 2nd semester I3				176	0	176	384	17.5

Table 4: Curriculum for 4th year (I4) semester 1:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French			0	0	32	32	1
2	English			0	0	32	32	1
3	Principles of Remote Sensing			16	0	16	32	1.5
4	Mineral Exploration			48	0	0	48	3
5	Geophysics			32	0	32	64	3
6	Basic Geological Mapping			32	0	0	32	2
7	Hydrogeology			32	0	0	32	2
8	Rock Blasting Techniques			32	0	0	32	2
9	Petroleum Geology			48	0	0	48	3
10	Rock Mechanics			32	0	0	32	2
Total for 1st semester I4				272	0	112	384	20.5

Table 5: Curriculum for 4th year (I4) semester 2:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French			0	0	32	32	1
2	English			0	0	32	32	1
3	Principles of Slope Stability			16	16	0	32	1.5
4	Well logging and Reservoir Evaluation			48	0	0	48	3
5	Surface and Underground Mining			48	0	0	48	3
6	Drilling Techniques			32	0	0	32	2
7	Fluid Mechanics			32	0	0	32	2
8	Cement Production Technology			32	0	0	32	2
9	Foundation Engineering I			16	16	0	32	1.5
10	Petroleum Chemistry			32	0	0	32	2
11	Deep Excavation			32	0	0	32	2
Total for 2nd semester I4				272	48	64	384	20.5

Table 6: Curriculum for 5th year (I5) semester 1:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French			0	0	32	32	1
2	English			0	0	32	32	1
3	Foundation Engineering II			32	16	0	48	2.5
4	Fundamental of Petroleum Engineering			48	0	0	48	3
5	Mineral Processing			16	0	32	48	2
6	Research Methodology			16	0	0	16	1

7	Oil and Gas Resources Development			48	0	0	48	3
8	Project Management			32	0	0	32	2
9	Economics and Management of Mineral Resources			32	0	0	32	2
10	Geo-environment			32	0	0	32	2
11	Work Safety and Ethics			16	0	0	16	1
12	Internship Report			0	0	0	0	2
Total for 1st semester I5				288	0	96	384	21

Table 7: Curriculum for 5th year (I5) semester 2:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	Final Year Internship							9
Total for 2nd semester I5								9

Annex 7

Detail of modification of Mechanical Engineering Program

1. BACKGROUND

The Mechanical Engineering program at the Institute of Technology of Cambodia (ITC) boasts a rich history, evolving alongside Cambodia's growing need for skilled professionals in mechanization and automation across various sectors. Originally offered within a combined program with Industrial Engineering, the program became independent in 2012. This separation allowed for a more specialized Mechanical Engineering curriculum, preparing graduates for the anticipated advancement of technologies that would drive Cambodia's industrial progress.

Presently, with Cambodia's rapid industrialization and commitment to economic diversification, we see the urgent need to further revise and modernize the curriculum. This revision aims to equip graduates with the skills and knowledge to address the challenges and opportunities presented by Industry 4.0, the rise of Artificial Intelligence, and the ever-evolving global landscape.

Cambodia's national focus on industrial growth has fueled a surging demand for skilled mechanical engineers. This trend directly aligns with the country's development goals outlined in the Industrial Development Policy 2015-2025 (IDP 2025), which targets transforming Cambodia into a "upper-middle-income" nation by 2030, heavily reliant on a robust industrial sector. (<https://cdc.gov.kh/wp-content/uploads/2022/04/IDP-English.pdf>)

One of the key strategies is mobilizing and attracting foreign investments as well as private domestic investments in prioritized sectors which include manufacturing and support industries. The key sectors like garments, automotive parts, and electronics, all of which heavily rely on mechanical engineers for:

- Designing and developing production processes and machinery
- Implementing, and maintaining mechanical systems
- Optimizing production lines for efficiency and quality control
- Integrating sustainable energy solutions
- Supervising and managing teams of technicians.

Furthermore, mechanical engineers play a critical role in Cambodia's construction sector, acting as the core force behind MEP (Mechanical, Electrical, and Plumbing) works in all new and existing construction projects. Their expertise is essential for designing, installing, and maintaining of:

- Heating, ventilation, and air conditioning (HVAC) systems
- Plumbing systems, Fire protection systems
- Elevators and escalators
- Building automation systems.

According to the Ministry of Economy and Finance (MEF), the garment, footwear, and travel goods industry alone, which contributes significantly to Cambodia's GDP, employed over 750,000 individuals in 2022 (<https://www.khmersme.gov.kh/en/news/cambodias-garment-footwear-travel-goods-exports-up-40-pct-in-h1-of-2022/>). This vast industry, along with the growing automotive and electronics sectors, necessitates a substantial pool of qualified mechanical engineers.

Furthermore, a report by the World Bank estimates that Cambodia's manufacturing sector will continue to grow at a rate of 7-8% annually for the next five years (<https://data.worldbank.org/indicator/NV.IND.MANF.ZS?locations=KH>). This projected growth further underscores the critical role mechanical engineers will play in driving this expansion and ensuring Cambodia's continued industrial development.

Table 1: Curriculum of the existing 3rd Year Mechanical Engineering program

SUBJECTS	Number of hours							Number of credits			
	3A		4A		5A		TOTAL	Lecture	Exercise	Practice	TOTAL
	I	II	I	II	I	II					
French	64						64		2		2
English	32						32		1		1
Statistics	48						48	1	1		2
Mechanics	64						64	2	1		3
Electrotechnics	32						32	2			2
Materials Sciences I	64						64	2		1	3
Mechanical production, Metrology	48						48	1		1	2
Mechanical design	64						64	2		1	3
French		32					32		1		1
English		64					64		2		2
Computer programming (Matlab)		32					32		1		1
Strength of materials		64					64	2		1	3
Fluids mechanics		64					64	2		1	3
Computer Aid Design (CAD)		48					48	1		1	2
Thermics		48					48	1	1		2
Total I3-GIM								16	10	6	32

2. PROPOSE MODIFICATION

To ensure the most effective use of our available faculty resources, we will prioritize the deep revision and modernization of other programs within the GIM department before tackling the Mechanical Engineering program. This prioritization ensures we can dedicate the necessary focus and resources to each program for a successful revision. We plan to begin the in-depth revision of the Mechanical Engineering program curriculum from next year onwards.

The Mechanical Engineering and Industrial Engineering programs at GIM share a common curriculum in the third year, allowing for the efficient development of a strong foundation in core engineering principles

for both specializations. Therefore, as we modify the Industrial Engineering program, the third year of the Mechanical Engineering program will be modified accordingly.

Table 2: Curriculum of the proposed modified 3rd Year Mechanical Engineering Program

SUBJECTS	Number of hours						Number of credits				
	3A		4A		5A		TOTAL	Lecture	Exercise	Practice	TOTAL
	I	II	I	II	I	II					
French	64						64		2		2
English	32						32		1		1
Statistics	48						48	1	1		2
Mechanics	48						48	2	1		3
Computer Aid Design (CAD)	48						48	1		1	2
Materials Sciences I	48						48	2		0,5	2,5
Introduction to Control theory	32						32	1	0,5		1,5
Thermal Engineering	64						64	2	1		3
Mechanical design		48					48	2		1	3
French		32					32		1		1
English		64					64		2		2
Introduction to AI for Engineering Applications		48					48	1	0,5	0,5	2
Strength of materials		64					64	2		1	3
Electricity and Electronics		48					48	1	1		2
Introduction to Manufacturing Engineering		48					48	3			3
Metal machining, Metrology		48					48	1		1	2
Total I3-GIM								19	11	5	35

Annex 8

Detail of modification of Industrial Engineering Program

1. BACKGROUND

The Industrial Engineering program at the Institute of Technology of Cambodia (ITC) has a rich history, evolving alongside Cambodia's growing industrial sector. Originally offered within a combined Industrial and Mechanical Engineering program, the program became independent in 2012. This separation aimed to streamline the curriculum, allowing for the inclusion of more specialized industrial engineering subjects to better prepare graduates for the anticipated rise in demand for industrial engineers.

The early years of the independent program were marked by a pragmatic approach to curriculum design. A limited pool of qualified lecturers, coupled with a nascent interest in industrial engineering among students and a young job market in the field, necessitated careful planning. However, this did not stifle the program's growth. Recognizing the significant strides made by Cambodia's industrial sector, coupled with national policy initiatives and the rapid pace of technological advancement, a first curriculum revision was undertaken in 2018.

Presently, with Cambodia's rapid industrialization and commitment to economic diversification, we see the urgent need to further revise and modernize the curriculum. This revision aimed to improve upon the existing program and prepare graduates for the challenges and opportunities presented by Industry 4.0, the rise of Artificial Intelligence, and the ever-evolving global landscape.

Cambodia's rapid industrialization, coupled with its commitment to economic diversification, has created a significant demand for skilled industrial engineers. This aligns perfectly with the country's ambitious goals outlined in the Industrial Development Policy 2015-2025 (<https://cdc.gov.kh/wp-content/uploads/2022/04/IDP-English.pdf>), which aims to transform Cambodia into an "upper-middle-income" nation by 2030 through a robust industrial sector.

One of the key strategies is mobilizing and attracting foreign investments as well as private domestic investments in prioritized sectors which include manufacturing and support industries. Key sectors like garments, automotive parts, and electronics all heavily rely on industrial engineers to:

- Optimize production processes and workflows
- Design and implement efficient layouts for factories and production lines
- Analyze and improve quality control systems
- Manage and integrate automation and technology
- Ensure adherence to safety regulations and environmental standards

Furthermore, the construction sector, experiencing significant growth in Cambodia, also presents opportunities for industrial engineers to contribute their expertise in:

- Project planning and management
- Cost analysis and optimization
- Supply chain management
- Facility design and layout

According to the Ministry of Economy and Finance (MEF), the garment, footwear, and travel goods industry alone, a significant contributor to Cambodia's GDP, employed over 750,000 individuals in 2022

(<https://cleanclothes.org/resources/publications/factsheets/cambodia-factsheet-february-2015.pdf>). This vast industry, along with the growing automotive, electronics, and construction sectors, necessitates a substantial pool of qualified industrial engineers.

A report by the World Bank estimates Cambodia's manufacturing sector to grow at 7-8% annually for the next five years (<https://data.worldbank.org/indicator/NV.IND.MANF.ZS?locations=KH>). This projected growth, coupled with the ongoing development in various sectors, emphasizes the critical role industrial engineers will play in enhancing Cambodia's industrial efficiency, boosting productivity, and ensuring its sustainable economic development.

The Industrial Engineering program at ITC is committed to providing graduates with the necessary skills and knowledge to thrive in this dynamic environment. By continuously modernizing the curriculum, we aim to equip them to become the driving force behind Cambodia's industrial success story.

Table 1: Curriculum of the existing Industrial Engineering program

SUBJECTS	Number of hours							Number of credits			
	3A		4A		5A		TOTAL	Lecture	Exercise	Practice	TOTAL
	I	II	I	II	I	II					
French	64						64		2		2
English	32						32		1		1
Statistics	48						48	1	1		2
Mechanics	64						64	2	1		3
<i>Electrotechnics</i>	32						32	2			2
Materials Sciences I	64						64	2		1	3
Mechanical production, Metrology	48						48	1		1	2
<i>Mechanical design</i>	64						64	2		1	3
French		32					32		1		1
English		64					64		2		2
<i>Computer programming (Matlab)</i>		32					32		1		1
Strength of materials		64					64	2		1	3
<i>Fluids mechanics</i>		64					64	2		1	3
Computer Aid Design (CAD)		48					48	1		1	2
<i>Thermics</i>		48					48	1	1		2
Total I3-GIM								16	10	6	32
Training after year three										2	2
French			32				32		1		1
English			32				32		1		1
<i>Industrial Hydraulics</i>			32				32	2			2
<i>Electronics</i>			32				32	2			2

Power Electronics			32				32	2			2
Organs of machines			48				48	1	1		2
Servo-control systems			48				48	1	1		2
Computer Aids Manufacturing (CAM)			32				32	2			2
Welding technology			48				48	1		1	2
Operations Research			48				48	1	1		2
French				32			32		1		1
English				32			32		1		1
Metallic materials operations				48			48	1	1		2
Automation				48			48	1		1	2
Industrial ergonomic				48			48	1		1	2
Materials Sciences II				48			48	1	1		2
Product design				48			48	1		1	2
Lean Manufacturing I				32			32	2			2
Project Management				48			48	1		1	2
Total I4-GIM								20	9	7	36
French					32		32		1		1
English					32		32		1		1
Research Methodology					32		32	2			2
Regulation					32		32	2			2
Operations Management					48		48	1	1		2
Advanced manufacturing process					48		48	1		1	2
Lean Manufacturing II					48		48	1		1	2
Engineering Ethics, Health and Safety					48		48	1	1		2
Design of Experiments					32		32	2			2
Green Boiler Technology					32		32	2			2
Final year training						384				9	9
Total I5-GIM								12	4	11	27
Total per semester	416	352	384	384	384			48	23	24	95
TOTAL GENERAL	768		768	384	384	2304					

2. PROPOSE MODIFICATION

The proposed modifications have been carefully considered based on the following aspects:

- Eliminate less relevant subjects.
- Rearrange the year 3 syllabus to focus on core and relevant fundamental subjects.
- Modernize the curriculum to reflect current trends in technology development.
- Align with Cambodia's industrial development policy and economic digitalization.
- Provide students with a strong foundation in the core principles and theories of industrial engineering.
- Foster an appreciation for the interdisciplinary nature of industrial engineering.
- Emphasize the importance of continuous improvement in industrial processes.
- Introduce project-based learning to motivate and engage students, enhancing both practical and soft skills.
- Equip students with the tools to effectively lead and manage projects and teams.

Since the Industrial Engineering and Mechanical Engineering programs at GIM share the same third year, the subjects are designed to be common, building a strong foundation for both specializations.

2.1. Deleted courses

- Computer Programming (MATLAB) (GIMI32MLB)
- Organs of Machines (INDI41ODM)
- Welding Technology (INDI41SDG)
- Materials Science II (INDI42SM2)
- Design of Experiments (INDI51CDE)
- Green Boiler Technology (INDI51TVC)

2.2. Combined and renamed courses

Fluid Mechanics (GIMI32MDF) and Thermics (GIMI32THM)

➔ Thermal Engineering (GIMI32THM)

Electrotechnics (GIMI31ELT) and Electronics (INDI4ELN)

➔ Electricity and Electronics (GIMI31ELT)

Mechanical Design (GIMI31CON) and Industrial Hydraulics (INDI41HDI)

➔ Mechanical Design (GIMI31CON)

Servo-control systems (INDI41SAS) and Regulation (INDI51RGT)

➔ Introduction to Control Theory (GIMI31SAS)

Metallic material operations (INDI42MOM)

➔ INDI41PRP: Production Process

1.3. New courses

- Introduction to AI for Engineering Applications (GIMI32IIA)
- Introduction to Manufacturing Engineering (GIMI32IME)
- Engineering Economics (INDI42ECI)
- Total Productive Maintenance (INDI41TPM)
- Supply Chain Management I (INDI41GC1)
- Supply Chain Management II (INDI42GC2)
- Engineering Health and Safety (INDI42EHS)
- Multidisciplinary Project I (INDI42MP1)
- Multidisciplinary Project II (INDI51MP2)
- Professional and Personal Development (INDI51DPP)

Table 2: Curriculum of the proposed modified Industrial Engineering Program

SUBJECTS	Number of hours							Number of credits			
	3A		4A		5A		TOTAL	Lecture	Exercise	Practice	TOTAL
	I	II	I	II	I	II					
French	64						64		2		2
English	32						32		1		1
Statistics	48						48	1	1		2
Mechanics	48						48	2	1		3
Computer Aid Design (CAD)	48						48	1		1	2
Materials Sciences I	48						48	2		0,5	2,5
Introduction to Control theory	32						32	1	0,5		1,5
Thermal Engineering	64						64	2	1		3
Mechanical design		48					48	2		1	3
French		32					32		1		1
English		64					64		2		2
Introduction to AI for Engineering Applications		48					48	1	0,5	0,5	2
Strength of materials		64					64	2		1	3
Electricity and Electronics		48					48	1	1		2

Introduction to Manufacturing Engineering		48					48	3			3
Metal machining, Metrology		48					48	1		1	2
Total I3-GIM								19	11	5	35
Year 3 Internship										2	2
French			32				32		1		1
English			32				32		1		1
Machine Learning			48				48	1	1		2
Operations Research			48				48	1	1		2
Power Electronics			32				32	2			2
Computer Aids Manufacturing (CAM)			48				48	1		1	2
Engineering Economics			32				32	1	0,5		1,5
Production Process			32				32	1	0,5		1,5
Total Productive Maintenance			32				32	1	0,5		1,5
Supply Chain Management I			32				32	1	0,5		1,5
French				32			32		1		1
English				32			32		1		1
Automation				48			48	1		1	2
Ergonomic Design				48			48	1		1	2
Industrial Design				48			48	1		1	2
Quality Management (Lean I)				48			48	2	0,5		2,5
Engineering Health and Safety				32			32			1	1
Supply Chain Management II				32			32	1	0,5		1,5
Project Management				48			48	1		1	2
Multidisciplinary Project I				32			32			1	1
Total I4-GIM								16	9	9	32
French					32		32		1		1
English					32		32		1		1
Research Methodology					32		32	1		0,5	1,5

Operations Management					48		48	1	1		2
Advanced machining process					48		32	1	0,5		1,5
Industrial Planning and Control (Lean II)					48		48	1	1		2
Professional and Personal Development					48		32	1		0,5	1,5
Engineering Ethics					48		48	1	1		2
Multidisciplinary Project II					48		48			1,5	1,5
Final year internship						384	384			9	9
Total I5-GIM								6	4,5	11,5	23
Total per semester	384	400	368	400	384	384	2288	41	24,5	25,5	90
TOTAL GENERAL	784		768		768		2320				

Annex 9

Detail of proposed modification of Water Resources Engineering and Rural Infrastructure (WRI)

1. BACKGROUND

Engineering program in Water Resources Engineering and Rural Infrastructure (WRI) provides the knowledge and skill for the construction of water-related infrastructures such as the construction of dams, bridges, reservoirs, canals, roads, irrigation systems, retaining walls, and foundations. The student will learn about water resources planning, modelling, and design for water resources projects. This specialization will provide critical thinking on basin management studies, and provide water resources planning. Based on the tracer study from 2021 to 2023, there are 50% of graduates from the WRI program got the job related to infrastructure development such mainly road construction. It is clearly shown that the soft skills become more important for their working environment which they have mention leadership and entrepreneurship skill is lacking in their professional work. Due to the need of job market in this skill particularly road construction, we decided to upgrading the program. The upgrading is aimed to improve the quality of the program in order to meet the need of the local job market and promoting the 21st century skills to the new graduates. There are two aspects shall be improved as following:

- Improving the competency of road construction and irrigation engineering
 - Improve soft-skills through Skills for Employability session
 - Integrated Problem-Based Learning method and improve the computing program which is really important for the 21st century working skills.
- **Human Resources:**
 - In academic year 2023-2024, Faculty of Hydrology and Water Resources Engineering has 23 (F:7) full-time lecturers possess Master and PhD degree. PhD fulltime: 15 (F:5), PhD Part-time: 3 (F:0), Master fulltime: 8 (F:2), Master Part-time: 5 (F:1).
 - The WRI program has a professional program coordinator to review and develop the program based on job market needs
 - Host series of up-skill training for department's staffs to effectively improve the course content and teaching method
 - **Facility:**

Main facilities currently available and particularly support the WRI program:

- Hydrology and Hydraulics Lab
- Soil Lab
- Topography Lab
- HydroMet and Disaster Management Lab
- Coastal & Wetland Environmental Lab
- Khmer Earth Observation Lab
- Irrigation experimental station

Through the HEIP2, the faculty proposed to upgrade the lab equipment for student practices including equipment for hydrology demonstration in laboratory.

- **Program Marketing:** boost the visualization of the program by

- Organized students' monthly seminar with invited speaker from alumni of WRI
- Invite companies to join career fair and join the thesis defend day
- Develop attractive brochures and other promotion materials for both online and offline campaign
- Promote to high school students through the students networking and promotion mission in the province
- Expand the collaboration with stakeholders to promote internships, research collaboration, training seminar and other practical skills.

2. PROPOSE MODIFICATION OF CURRICULUM OF WATER RESOURCES ENGINEERING AND RURAL INFRASTRUCTURE (WRI)

For the upcoming academic year, the WRI program requested to remove 3 courses by replacing 2 new courses which are Skills for Employability, and Climate-resilient Road Design. The others 2 courses are modified the name. The total number of credits is proposed to change from 94.5 credits to 93 credits while the total number of hours remains same.

Table 1: Summary of propose modification:

Gr.	No.	Name of Subject	Current Situation					New Proposal				
			C (hr)	TD (hr)	TP (hr)	Total (hr)	Credit	C (hr)	TD (hr)	TP (hr)	Total (hr)	Credit
I3-S1	1	French		64		64	2		64		64	2
	2	English		32		32	1		32		32	1
	3	Statistics	16	32		48	2	16	32		48	2
	4	Fluid Mechanics	32	16	16	64	3	32	16	16	64	3
	5	Soil Science	16	16	16	48	2	16	16	16	48	2
	6	Strength of Materials	16	32		48	2	16	32		48	2
	7	Meteorology	16			16	1	16	16		32	1.5
	8	Geology and Hydrogeology	16	16		32	1.5	16	16		32	1.5
	9	Hydrometeorology	16	16		32	1.5	Remove				
	10	Skills for Employability	Add New						16		16	0.5
Total of I3-S1			128	224	32	384	16	112	240	32	384	15.5
I3-S2	1	French		32		32	1		32		32	1
	2	English		64		64	2		64		64	2
	3	Computer-aided Design (AutoCAD)			32	32	1			32	32	1
	4	Hydrology	32	16	16	64	3	32	16	16	64	3

	5	Soil Mechanics and Foundations	32	16	16	64	3	32	16	16	64	3
	6	Surveying	16	16	48	80	3	16	16	48	80	3
	7	MATLAB	16		16	32	1.5	Remove				
	8	Introduction to Environmental Engineering	16			16	1	Remove				
	9	Computing programing	Add New					16		32	48	2
	Total of I3-S2			112	144	128	384	15.5	96	144	144	384
I4-S1	1	French I		32		32	1		32		32	1
	2	English I		32		32	1		32		32	1
	3	Hydraulics	16	16	16	48	2	16	16	16	48	2
	4	Structural Analysis	32	32		64	3	32	32		64	3
	5	Construction Materials	16		32	48	2	16		32	48	2
	6	Earth Dam Design and Construction	16	16	16	48	2	16	16	16	48	2
	7	GIS and Remote Sensing	16		64	80	3	16		64	80	3
	8	Water-induced Disaster Risk Assessment	32			32	2	Remove				
	9	Disaster Risk Assessment	Add New					32			32	2
	Total of I4-S1			128	128	128	384	16	128	128	128	384
I4-S2	1	French II		32		32	1		32		32	1
	2	English II		32		32	1		32		32	1
	3	Reinforced Concrete Design	32	32		64	3	32	32		64	3
	4	Groundwater Exploration	32			32	2	32			32	2
	5	Irrigation and Drainage System	32	32		64	3	32	48		80	3.5
	6	Road Engineering and Construction	32	16	16	64	3	32	16	16	64	3
	7	On-site Safety Management	16			16	1	16			16	1
	8	Introduction to Integrated Water Resources Management	16			16	1	16			16	1

	9	Hydropower Development and Pumping Station	32	16	16	64	3	Remove				
	10	Climate-resilient Road Design	Add New					16	32		48	2
	Total of I4-S2		192	160	32	384	18	176	192	16	384	17.5
I5-S1	1	Module d'Insertion Professionnelle (MIP)		32		32	1		32		32	1
	2	English for Work and Career: Engineering Skills		32		32	1		32		32	1
	3	Internship					2					2
	4	Land Management	16	32		48	2	16	32		48	2
	5	Climate Change Impacts and Adaptation	32			32	2	32			32	2
	6	Hydraulic Structures	32	32	32	96	4	32	32	32	96	4
	7	Water Resources Economics	32			32	2	32			32	2
	8	Cost Estimating and Contracting	16			16	1	16			16	1
	9	Project Management	32			32	2	32			32	2
	10	Multi-Disciplinary Design Project	32	32		64	3	32	32		64	3
		Total of I5-S1		192	160	32	384	20	192	160	32	384
I5-S2	1	Final Year Internship				384	9				384	9
	Total of I5-S2					384	9				384	9
Total of WRI			752	816	352	2304	94.5	704	864	352	2304	93

3. CURRICULUM OF THE PROPOSED PROGRAM WRI

This curriculum is designed for an engineering degree that illustrates the whole three years program in Water Resources Engineering and Rural Infrastructure (WRI) from the 3rd year to 5th year. The curriculum of the WRI in the academic year 2024-2025 is shown below:

Table 2: New curriculum of WRI

Gr.	No.	Name of Subject	C (hr)	TD (hr)	TP (hr)	Total (hr)	Credit
I3-S1	1	French		64		64	2

	2	English		32		32	1
	3	Statistics	16	32		48	2
	4	Fluid Mechanics	32	16	16	64	3
	5	Soil Science	16	16	16	48	2
	6	Strength of Materials	16	32		48	2
	7	Meteorology	16	16		32	1.5
	8	Geology and Hydrogeology	16	16		32	1.5
	9	Skills for Employability		16		16	0.5
	Total of I3-S1		112	240	32	384	15.5
I3-S2	1	French		32		32	1
	2	English		64		64	2
	3	Computer-aided Design (AutoCAD)			32	32	1
	4	Hydrology	32	16	16	64	3
	5	Soil Mechanics and Foundations	32	16	16	64	3
	6	Surveying	16	16	48	80	3
	7	Computing programing	16		32	48	2
	Total of I3-S2		96	144	144	384	15
I4-S1	1	French I		32		32	1
	2	English I		32		32	1
	3	Hydraulics	16	16	16	48	2
	4	Structural Analysis	32	32		64	3
	5	Construction Materials	16		32	48	2
	6	Earth Dam Design and Construction	16	16	16	48	2
	7	GIS and Remote Sensing	16		64	80	3
	8	Disaster Risk Assessment	32			32	2
	Total of I4-S1		128	128	128	384	16
I4-S2	1	French II		32		32	1
	2	English II		32		32	1
	3	Reinforced Concrete Design	32	32		64	3

	4	Groundwater Exploration	32			32	2
	5	Irrigation and Drainage Systems	32	48		80	3.5
	6	Road Engineering and Construction	32	16	16	64	3
	7	On-site Safety Management	16			16	1
	8	Introduction to Integrated Water Resources Management	16			16	1
	9	Climate-resilient Road Design	16	32		48	2
	Total of I4-S2		176	192	16	384	17.5
I5-S1	1	Module d'Insertion Professionnelle (MIP)		32		32	1
	2	English for Work and Career: Engineering Skills		32		32	1
	3	Internship					2
	4	Land Management	16	32		48	2
	5	Climate Change Impacts and Adaptation	32			32	2
	6	Hydraulic Structures	32	32	32	96	4
	7	Water Resources Economics	32			32	2
	8	Cost Estimating and Contracting	16			16	1
	9	Project Management	32			32	2
	10	Multi-Disciplinary Design Project	32	32		64	3
	Total of I5-S1		192	160	32	384	20
I5-S2	1	Final Year Internship				384	9
	Total of I5-S2					384	9
Total of WRI			704	864	352	2304	93

Annex 10

Detail of proposed modification of Water and Environmental Engineering (WEE)

1. BACKGROUND

Water and Environmental Engineering Program (WEE) is established in 2018 under the faculty of hydrology and water resources engineering (GRU) responds to the needs of engineers and expert on WASH sector. WEE program was updated in 2022 to adopt green education strategies and Lab Base Education and Problem-Based Learning method for the maximum benefit of 4C's education and 21st-century skills. There were 94 students graduated in 2023, 80% of them go the job and own a business while another 20% continue master degree in Cambodia and in other countries. However, we found that the students face difficulty to follow the specialized course of Unit Operations and Processes for Environmental Engineering due to the lack of fundamental course of engineering which is a basic of unit operation course. Therefore, we propose to modify some courses to improve the student competency base. There are two aspects shall be improved as following:

- Improving the competency of wastewater engineering on unit operation
 - Improve soft-skills through Skills for Employability
 - Integrated Problem-Based Learning method and improve the computing program which is really important for the 21st century working environment.
- **Human Resources:**
 - In academic year 2023-2024, Faculty of Hydrology and Water Resources Engineering has 23 (F:7) full-time lecturers possess Master and PhD degree. PhD fulltime: 15 (F:5), PhD Part-time: 3 (F:0), Master fulltime: 8 (F:2), Master Part-time: 5 (F:1).
 - The WEE program has a professional program coordinator to review and develop the program based on job market needs
 - Highly competent of lecturers with long working experience which keep improving the course content and teaching method
 - **Facility:**

Main facilities currently available and particularly support the WRI program:

- Hydrology and Hydraulics Lab
- Water Quality Lab
- Plumbing lab
- HydroMet and Disaster Management Lab
- Water Environment Lab
- Coastal & Wetland Environmental Lab
- Khmer Earth Observation Lab

Through the HEIP2, the faculty proposed to upgrade facilities for the implementation of PBL such as Equipment for Water and Wastewater, and Equipment for Plumbing Experiment and Testing.

- **Program Marketing:** boost the visualization of the program by
 - Organized students' monthly seminar with invited speaker from alumni of WEE

- Invite companies to join career fair and join the thesis defend day
- Develop attractive brochures and other promotion materials for both online and offline campaign
- Promote to high school students through the students networking and promotion mission in the province
- Expand the collaboration with stakeholders to promote internships, research collaboration, training seminar and other practical skills.

2. PROPOSE MODIFICATION OF CURRICULUM OF WATER AND ENVIRONMENTAL ENGINEERING (WEE)

For the upcoming academic year, the WEE program requested to remove 2 courses by replacing 2 new courses which are Skills for Employability, and Fundamental for Environmental Engineering. The others 2 courses are modified the name. The total number of credits is proposed to change from 97.5 credits to 97 credits while the total number of hours remains same.

Table 1: Summary of propose modification:

Gr.	No.	Name of Subject	Current Situation					New Proposal				
			C (hr)	TD (hr)	TP (hr)	Total (hr)	Credit	C (hr)	TD (hr)	TP (hr)	Total (hr)	Credit
I3-S1	1	French		64		64	2		64		64	2
	2	English		32		32	1		32		32	1
	3	Statistics	16	32		48	2	16	32		48	2
	4	Fluid Mechanics	32	16	16	64	3	32	16	16	64	3
	5	Soil Science	16	16	16	48	2	16	16	16	48	2
	6	Strength of Materials	16	32		48	2	16	32		48	2
	7	Meteorology	16			16	1	16	16		32	1.5
	8	Geology and Hydrogeology	16	16		32	1.5	16	16		32	1.5
	9	Hydrometeorology	16	16		32	1.5	Remove				
	10	Skills for Employability	Add New						16		16	0.5
Total of I3-S1			128	224	32	384	16	112	240	32	384	15.5
I3-S2	1	French		32		32	1		32		32	1
	2	English		64		64	2		64		64	2
	3	Computer-aided Design (AutoCAD)			32	32	1			32	32	1
	4	Hydrology	32	16	16	64	3	32	16	16	64	3
	5	Soil Mechanics and Foundations	32	16	16	64	3	32	16	16	64	3

	6	Surveying	16	16	48	80	3	16	16	48	80	3
	7	MATLAB	16		16	32	1.5	Remove				
	8	Introduction to Environmental Engineering	16			16	1	Remove				
	9	Computing Programing	Add New					16		32	48	2
	Total of I3-S2		112	144	128	384	15.5	96	144	144	384	15
I4-S1	1	French I		32		32	1		32		32	1
	2	English I		32		32	1		32		32	1
	3	Chemistry for Environmental Engineering	16	32		48	2	16	32		48	2
	4	Biology for Environmental Engineering	48			48	3	48			48	3
	5	Environmental Engineering Laboratory			32	32	1			32	32	1
	6	GIS and Remote Sensing	16		64	80	3	16		64	80	3
	7	Environmental Hydraulics	16	16	16	48	2	16	16		32	1.5
	8	Unit Operations and Processes for Environmental Engineering	32	32		64	3	Remove				
	9	Fundamental for Environmental Engineering	Add New					32	16		48	2.5
	10	Environmental Pollution Control	Add New					32			32	2
	Total of I4-S1		128	144	112	384	16	160	128	96	384	17
I4-S2	1	French II		32		32	1		32		32	1
	2	English II		32		32	1		32		32	1
	3	Water Quality Analysis and Management	32			32	2	32			32	2
	4	Water Treatment Processes and Design	32	32		64	3	32	16		48	2.5
	5	Water Supply Engineering	32	32		64	3	32	32		64	3
	6	Hydro-informatics	32			32	2	32			32	2

	7	Introduction to Integrated Water Resources Management	16			16	1	16			16	1
	8	Plumbing Design	48	16	16	80	4	Remove				
	9	Environmental Pollution Control	32			32	2	Remove				
	10	Unit Operations and Processes for Environmental Engineering	Add New					16	32		48	2
	11	Building Sanitation Engineering	Add New					48	16	16	80	4
	Total of I4-S2		224	144	16	384	19	208	160	16	384	18.5
I5-S1	1	Module d'Insertion Professionnelle (MIP)		32		32	1		32		32	1
	2	English for Work and Career: Engineering Skills		32		32	1		32		32	1
	3	Internship					2					2
	4	Design of Wastewater Treatment and Collection System	48	32		80	4	48	32		80	4
	5	Solid Waste Management	32			32	2	32			32	2
	6	Urban Drainage and Sewage System	32	32		64	3	32	32		64	3
	7	Environmental Engineering Project	32			32	2	32			32	2
	8	Environmental Impact Assessment	32			32	2	32			32	2
	9	Sustainable and Green Energy Systems	32			32	2	32			32	2
	10	Work Safety	16			16	1	16			16	1
	11	Research Methodology	32			32	2	32			32	2
		Total of I5-S1		256	128	0	384	22	256	128	0	384
I5-S2	1	Final Year Internship				384	9				384	9
	Total of I5-S2					384	9				384	9
Total of WRI			848	784	288	2304	97.5	832	800	288	2304	97

3. CURRICULUM OF THE PROPOSED PROGRAM WEE

This curriculum is designed for an engineering degree that illustrates the whole three years program in Water and Environmental Engineering (WEE) from the 3rd year to 5th year. The curriculum of the WRI in the academic year 2024-2025 is shown below:

Table 2: New curriculum of WEE

Gr.	No.	Name of Subject	C (hr)	TD (hr)	TP (hr)	Total (hr)	Credit
I3-S1	1	French		64		64	2
	2	English		32		32	1
	3	Statistics	16	32		48	2
	4	Fluid Mechanics	32	16	16	64	3
	5	Soil Science	16	16	16	48	2
	6	Strength of Materials	16	32		48	2
	7	Meteorology	16	16		32	1.5
	8	Geology and Hydrogeology	16	16		32	1.5
	9	Skills for Employability		16		16	0.5
	Total of I3-S1			112	240	32	384
I3-S2	1	French		32		32	1
	2	English		64		64	2
	3	Computer-aided Design (AutoCAD)			32	32	1
	4	Hydrology	32	16	16	64	3
	5	Soil Mechanics and Foundations	32	16	16	64	3
	6	Surveying	16	16	48	80	3
	7	Computing Programming	16		32	48	2
	Total of I3-S2			96	144	144	384
I4-S1	1	French I		32		32	1
	2	English I		32		32	1
	3	Chemistry for Environmental Engineering	16	32		48	2
	4	Biology for Environmental Engineering	48			48	3

	5	Environmental Engineering Laboratory			32	32	1
	6	GIS and Remote Sensing	16		64	80	3
	7	Environmental Hydraulics	16	16		32	1.5
	8	Fundamental for Environmental Engineering	32	16		48	2.5
	9	Environmental Pollution Control	32			32	2
	Total of I4-S1		160	128	96	384	17
I4-S2	1	French II		32		32	1
	2	English II		32		32	1
	3	Water Quality Analysis and Management	32			32	2
	4	Water Treatment Processes and Design	32	16		48	2.5
	5	Water Supply Engineering	32	32		64	3
	6	Hydro-informatics	32			32	2
	7	Introduction to Integrated Water Resources Management	16			16	1
	8	Unit Operations and Processes for Environmental Engineering	16	32		48	2
	9	Building Sanitation Engineering	48	16	16	80	4
		Total of I4-S2		208	160	16	384
I5-S1	1	Module d'Insertion Professionnelle (MIP)		32		32	1
	2	English for Work and Career: Engineering Skills		32		32	1
	3	Internship					2
	4	Design of Wastewater Treatment and Collection System	48	32		80	4
	5	Solid Waste Management	32			32	2
	6	Urban Drainage and Sewage System	32	32		64	3
	7	Environmental Engineering Project	32			32	2
	8	Environmental Impact Assessment	32			32	2

	9	Sustainable and Green Energy Systems	32			32	2
	10	Work Safety	16			16	1
	11	Research Methodology	32			32	2
	Total of I5-S1		256	128	0	384	22
I5-S2	1	Final Year Internship				384	9
	Total of I5-S2					384	9
Total of WRI			832	800	288	2304	97

Annex 11

Detail of proposed separated Chemical Engineering and Food Science Technology from the third year and modify some major courses under Faculty of Chemical and Food Engineering

1. BACKGROUND

The Food Science Technology program is one of the programs under the faculty of Chemical and Food Engineering, established in 1986. This Food Engineering program is a combination of food science, technology, and engineering with the core focus on problem-solving, process optimization, Food industrial design, Food Processing Technology, Food product development, valorization of by-products to reduce food waste, applied science and technology in food manufacturing, and **integration of digital solutions in the processes** (process optimization) to improve traceability, quality, safety, and efficiency in the production, and distribution system of Food. This program is highly relevant to the local needs and national development goals in Cambodia.

Chemical Engineering is a 5-year engineering program established in 2017 under the Faculty of Chemical and Food Engineering. This program is a combination of industrial process, bio-process, environment, chemistry, and engineering. Chemical engineers could be responsible for chemical production, synthesis, industrial development and design, and purification of materials that are associated with fuels biodiesel, and lubricants (petroleum), pharmaceuticals, cosmetics, fertilizers, synthetic fibers, microelectronic components, plastics, and food products. Chemical engineers are involved in minimizing and reducing the use of energy to make these products in safe and sustainable ways and lower the impact on the environment. This Chemical Engineering program shapes the students to different specializations of chemical engineering such as agro-chemical process and analysis engineering, pharmaceutical and cosmetic engineering, application of advanced organic chemistry, etc.) that could support to applied chemistry for industrial engineering, pharmaceutical, and cosmetic engineering, etc.

Two existing programs, the Chemical Engineering and Food Science Technology Program separated from the fourth year, so the students can study for their specialization for only 1 year and a half. Faculty plans to modify and improve the program to reach the national and regional standard (e.g AUN-QA) by 2029, so it is necessary to separate the program of Chemical Engineering and Food Science Technology from the third year. It means that the students will select the program (chemical Engineering or Food Science Technology) from their foundation year. After separating the program, the faculty will rearrange the program by integrating 21st-century skills, and project-based learning including the entrepreneurship course to create a business mindset and bring the products to markets, and the program also shapes the students to specialization by each semester.

2. PROPOSE MODIFICATION OF THE CURRICULUM OF CHEMICAL ENGINEERING

For the upcoming academic year, the program of chemical engineering and Food Science Technology requested to separate from Year 3 as following

Table 1: Summary of proposed modification of 7 courses in the Chemical Engineering program

Gr	No.	Name of course	Current Situation				New Proposal			
			C	TD	TP	Credit	C	TD	TP	Credit
I3C-S1	1	Fundamental Chemistry and Calibration	32	16	48	4	32	16	48	4
	2	Physical Chemistry	16	20	12	2	32	8	24	3
	3	Heat and Mass Transfer	16	32	32	3	32	8	24	3
	4	Unit Operation I (Move to I3ChS2)	16			1	0	0	0	0
	5	Numerical Computations in for Chemical Engineering	0	0	0	0	16	0	32	2
I3Che-S2	1	Analytical Chemistry	16	16	16	2	32	8	24	
	2	Fluid Mechanics	16	32	32	3	32	8	24	
	3	Numerical Method (Move to I3ChS1)	16	20	12	2	0	0	0	0
	4	General Microbiology	32	0	32	3	32	0	32	3
	5	Unit Operation (merge UO I and II)	16	8	24	2	32	8	24	3
I4Che-S1	1	Chemical Reaction, Kinetic and thermodynamics	32	0	32	3	32	0	32	3
	2	Analytical and Instrument Chemistry	16	32	32	3	16	32	32	3
	3	Computing Software for Chemical Reaction	32	0	32	3	32	0	32	3
	4	Fundamental Catalyze Reaction	32	0	0	2	32	0	0	2
	5	Transport Phenomena	32	16	16	3	32	16	16	3

	6	Industrial Chemical process (Merge Industrial chemical process I and II)	32	0	0	2	32	0	0	2
	7	Internship								
I4Che-S2	1	Entrepreneurship (Move from I5Ch-S1)	32	0	0	2	32	0	0	2
	2	Material Science	48	0	32	4	48	0	32	4
	3	Applied Organic Chemistry	48	0	32	4	48	0	32	4
	4	Biochemical Process	32	0	0	2	32	0	0	2
	5	Chemistry for Cosmetics and Pharmaceutical	48	0	32	4	48	0	32	4
I5Che-S1	1	Agro-chemical processing and analysis	48	0	32	4	48	0	32	4
	2	Law and regulation for Chemical Engineer (Move from I5ChS1)	32	0	32	3	32	0	32	3
	3	Water Chemistry and waste management	48	0	32	4	48	0	32	4
	4	Chemical Plant Safety and Environmental Assessment (including green chemistry)	32	0	0	2	32	0	0	2
	5	Chemical Engineering project management	32	0	0	2	32	0	0	2
	6	Chemical Industrial Concept Design	32	0	0	2	32	0	0	2
	7	Chemical Engineering Seminar (Deleted)	16	0	0	1	0	0	0	0

Table 2: Summary of proposed modification of 35 courses in the Food Science Technology program

Gr	No.	Name of course	Current Situation				New Proposal			
			C	TD	TP	Credit	C	TD	TP	Credit
	1	Fundamental Chemistry and	32	16	48	4	32	16	48	4

I3FSF-S1	2	Physical Chemistry for Food Engineering	16	20	12	2	24	14	24	3
	3	Mass and Heat transfer (Move to I3FSF S2 and merge with the fluid mechanic)	16	32	32	3	0	0	0	0
	4	Unit Operation I (Move to I3FSF S2 and merge with Unit Operation II)	16	0	0	1	0	0	0	0
	5	Food Analytical Chemistry (Move from I3FSF S2)	0	0	0	0	24	14	24	3
	6	Numerical Computations in Food Engineering (Move from I3FSF S2)	0	0	0	0	16	0	32	2
I3FSF-S2	1	Analytical Chemistry (Move to I3FSF S1)	32	0	32	3	0	0	0	0
	2	Fluid Mechanics, Heat and Mass Transfer in Food System (Merge course)	32	16	16	3	32	32	32	4
	3	Numerical Method (Move to I3FSF S1)	16	0	32	2	0	0	0	0
	4	General Microbiology (deleted course)	32	0	0	2	0	0	0	0
	5	Unit Operation in Food Engineering (Merge Unit Operation I and II)	48	20	12	4	32	32	32	4
	6	Food Microbiology (Merge course General+Food)	0	0	0	0	40	16	32	4
I4FSF-S1	1	Food Microbiology (Move to I3 FSFS2)	32	0	32	3	0	0	0	0
	2	Biochemical Engineering (Change name from Biochemistry)	32	0	32	3	32	0	32	0
	3	Nutrition and Health (Move to I5FSFS1)	32	0	0	2	0	0	0	0

	4	Food Preservation (merge I and II)	64	0	0	4	72	16	32	6
	5	Food Chemistry	32	0	32	3	32	0	32	3
	6	Biotechnology and Genetic Engineering (Merge biotech and genetic)	32	0	0	2	32	0	32	3
	7	Internship								
I4FSF-S2	1	Biotechnology (Move to I4FSFS1)	48	0	32	4	0	0	0	0
	2	Food Processing I (deleted)	48	0	32	4	0	0	0	0
	3	Food Packaging Technology (Change name from Packaging and Packing)	32	0	0	2	32	0	32	3
	4	Food Preservation II (Move to I4FSFS1)	32	0	0	2	0	0	0	0
	5	Food Safety (Move to I5FSFS1)	48	0	0	3	0	0	0	0
	6	Water Chemistry (Move to I5FSFS1)	16	8	24	2	0	0	0	0
	7	Cereal processing Technology (including nut, fait and oil) (New course)	0	0	0	0	32	8	24	3
	8	Fruit and vegetable processing technology (New course)	0	0	0	0	16	8	24	2
	9	Dairy and Ovo product processing Technology (New course)	0	0	0	0	8	0	16	1
	10	Beverage and Alcoholic beverage Technology (mainly soft drink) (New course)	0	0	0	0	8	0	16	1
	11	Product Development (Move from I5FSFS1)	0	0	0	0	32	0	32	3
	12	Sensory Evaluation (Move from I5FSFS1)	0	0	0	0	16	16	16	2

	13	Entrepreneurship in Agro Food Sector (Move from I5FSFS1)	0	0	0	0	32	0	0	2
	1	Agro-Food Industry Management	32	0	0	2	32	0	0	2
	2	Sensory Evaluation (Move to I4FSFS2)	32	0	0	2	32	0	0	2
	3	Project Management (deleted)	32	0	0	2	32	0	0	2
	4	Food Processing II (deleted)	80	0	32	6	0	0	0	0
	5	Entrepreneurship (Move to I4FSFS2)	32	0	0	2	0	0	0	0
	6	Food Quality Assurance	32	0	0	2	32	0	0	2
	7	Automation and Control in Food Industry	32	0	0	2	32	0	0	2
	8	Product Development (Move to I4FSFS2)	64	0	0	4	0	0	0	0
	9	Meat, Poultry, Fish, and seafood processing Technology (New course)	0	0	0	0	32	0	32	3
	10	Food Industrial Design (New course)	0	0	0	0	16	0	0	1
	11	Food fortification, nutrition and Health (Move from I4FSFS2)	0	0	0	0	32	0	0	2
	12	Water quality control and Food Industry waste management (Move from I4SFS2)	0	0	0	0	32	0	32	3
	13	Food Safety and Risk Management (Move from I4SFS2)	0	0	0	0	48	0	0	3
	14	Food Law and Regulation (New course)	0	0	0	1	16	0	0	1

3. CURRICULUM OF THE MODIFIED PROGRAM

This curriculum is designed for an engineering degree that illustrates the whole three years program Faculty of Chemical and Food Engineering from the 3rd year to 5th year, and separated Chemical Engineering program and Food Science Technology Program since year 3.

The curriculum of the Food Science and Technology in the academic year 2024-2025 is shown below:

Table 3: Curriculum for 3rd year (I3) semester 1:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French			0	0	64	64	2
2	English			0	0	32	32	1
3	Statistics			16	32	0	48	2
4	Fundamental Chemistry and Calibration			32	16	48	96	4
5	Food Analytical Chemistry			24	14	24	62	3
6	Numerical Computations in Food Engineering			16	0	32	48	2
7	Physical Chemistry for Food Engineering			24	14	24	62	3
Total for 1st semester I3				112	76	224	412	17

Table 4: Curriculum for 3rd year (I3) semester 2:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French					32	32	1
2	English					64	64	2
3	Fluid Mechanics, Heat and Mass Transfer in Food System			32	32	32	96	4
4	Unit Operation in Food Engineering			32	32	32	96	4
5	Food Microbiology (General+Food)			40	16	32	88	4
Total for 2nd semester I3				104	80	192	376	15

Table 5: Curriculum for 4th year (I4) semester 1:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French					32	32	1
2	English					32	32	1
3	Food Chemistry			32	0	32	64	2
4	Biochemical Engineering			32	0	32	64	2
5	Biotechnology and Genetic Engineering			32	0	32	64	2
6	Food Preservation Technology			72	16	32	120	6
7	Internship							2
Total for 1st semester I4				136	16	192	376	16

Table 6: Curriculum for 4th year (I4) semester 2:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French					32	32	1
2	English					32	32	1
3	Food Packaging Technology			32		32	64	3
4	Cereal processing Technology (including nut, fat and oil)			32	8	24	64	3
5	Fruit and vegetable processing technology (fruit juice)			16	8	24	48	2
6	Dairy and Ovo product processing Technology			8		16	24	1
7	Beverage and Alcoholic beverage Technology (mainly soft drink)			8		16	24	1
	Product Development			32		32	64	3
	Sensory Evaluation			16	16	16	48	2
	Entrepreneurship in Agro Food Sector			32			32	2
Total for 2nd semester I4				176	32	224	432	19

Table 7: Curriculum for 5th year (I5) semester 1:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French					32	32	1
2	English					32	32	1
3	Meat, Poultry, Fish, and seafood processing Technology			32		32	64	3
4	Food Industrial Design			16			16	1
5	Food fortification, nutrition and Health			32			32	2
6	Water quality control and Food Industry waste management			32	0	32	64	3
7	Food Safety and Risk Management			48		0	48	3
8	Food Quality Assurance			32			32	2
9	Automation and Control in Food Industry			32			32	2
10	Agro-Food Industrial Management			32			32	2
	Food Law and Regulation			16			16	1
Total for 1st semester I5				272	8	120	400	21

Table 8: Curriculum for 5th year (I5) semester 2:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	Final Year Internship							9
Total for 2nd semester I5								9

The curriculum of the Chemical Engineering in the academic year 2024-2025 is shown below:

Table 9: Curriculum for 3rd year (I3) semester 1:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French			0	0	64	64	2
2	English			0	0	32	32	1
3	Statistics			16	32	0	48	2

4	Fundamental Chemistry and Calibration			32	16	48	96	4
5	Physical Chemistry			32	8	24	64	3
6	Numerical Computations in for Chemical Engineering			16	0	32	48	2
7	Heat and Mass Transfer			32	8	24	64	3
Total for 1st semester I3				128	64	224	416	17

Table 10: Curriculum for 3rd year (I3) semester 2:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French			0	0	64	64	2
2	English			0	0	32	32	1
3	Analytical Chemistry			24	16	32	72	3
4	Fluid Mechanics			32	8	24	64	3
5	Unit Operation			24	16	32	72	3
6	General Microbiology			32	0	32	64	3
Total for 2nd semester I3				112	40	216	368	15

Table 11: Curriculum for 4th year (I4) semester 1:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French			0	0	32	32	1
2	English			0	0	32	32	1
3	Chemical Reaction, Kinetic and thermodynamics			32	0	32	64	3
4	Analytical and Instrument Chemistry			16	32	32	80	3
5	Computing Software for Chemical Reaction			32	0	32	64	3
6	Fundamental Catalyze Reaction			32	0	0	32	2
7	Transport Phenomena			32	16	16	64	3
8	Industrial Chemical process			32	0	0	32	1
9	Internship							2
Total for 1st semester I4				176	16	176	400	19

Table 12: Curriculum for 4th year (I4) semester 2:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French			0	0	32	32	1
2	English			0	0	32	32	1
3	Entrepreneurship			32	0	0	32	2
4	Material Science			48	0	32	80	4
5	Applied Organic Chemistry			48	0	32	80	5
6	Law and regulation for Chemical Engineer			32	0	0	32	2
7	Water Chemistry and waste management			48	0	32	80	4
Total for 2nd semester I4				208	0	160	368	19

Table 13: Curriculum for 5th year (I5) semester 1:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	French			0	0	32	32	1
2	English			0	0	32	32	1
3	Agro-chemical processing and analysis			48	0	32	80	4
4	Biochemical Process			32	0	32	64	3
5	Chemistry for Cosmetics and Pharmaceutical			48	0	32	80	4
6	Chemical Plant Safety and Environmental Assessment (including green chemistry)			32	0	0	32	2
7	Chemical Engineering project management			32	0	0	32	1
8	Chemical Industrial Concept Design			32	0	0	32	2
Total for 1st semester I5				224	0	160	384	18

Table 14: Curriculum for 5th year (I5) semester 2:

No.	Name of subject	Code	Instructor	Cour	TD	TP	Total	Credit
1	Final Year Internship							9
Total for 2nd semester I5								9

Annex 12

Detail of establishment of international program “Artificial Intelligence Engineering and Cybersecurity (AIECS)” – 5 Years Engineering Program under department GIC

1. BACKGROUND

The Engineering Program in Artificial Intelligence Engineering and Cybersecurity has established according not only the demand of nation, it is also the international demands during this digital age. Human resources in terms of Artificial Intelligence and Cybersecurity will lead as the front row to develop all the sectors of the country that related to technology. There are a lot of encouragement and demands from country to let us lead this education domain such as

- Cambodia’s Science, Technology & Innovation Roadmap 2023 has focused on five scientific and technological domains and one of them is to provide services and digital economy including Artificial Intelligence and space and spatial technology.
- Cambodia’s Digital Economy and Society Policy Framework 2021-2035, for the part of Cambodia Financial Technology Development aims to use 12 strategies to support this sector and the fourth one is to use Artificial Intelligence and Machine Learning to accomplish and develop this goal.
- Not only the financial sector, our digital government also set the Blueprint of the starting components on the digital path to digital transformation for Cambodia’s Digital and Economy and one of the components is privacy and security domain. In addition, our country also needs to provide the applicable digital laws and regulation and cybersecurity standard for our citizen too.
- For the science, technology and innovation ecosystem of Cambodia, we also need to provide the information and communication technology development policy for ICT business in all platforms.

With the current state of business of our country now is being transformed into digital platform and our government too that needed to be digital government so numerous of human resource in ICT skills especially the one who are in term of Artificial Intelligence and cybersecurity needed to produce tremendously.

Based on the potential, the Department of Information and Communication would like to establish the Engineering Program in Artificial intelligence Engineering and Cybersecurity. The program aims at promoting the standard of study of AI Engineering and Cybersecurity in Cambodia on the international stage and increasing job and research opportunities for local and international students. The university partner supporting the program is Curtin University in Australia and Malaysia. Therefore, the International Program is recognized by Australia and Malaysia.

2. ENGINEERING PROGRAM IN ARTIFICIAL INTELLIGENCE ENGINEERING AND CYBERSECURITY

2.1. Program Structure

The Engineering Program in Artificial Intelligence Engineering and Cybersecurity is designed to be flexible with a total of five years (2 years of foundation + 3 years of degree program).

➤ Foundation Program

The 1st year of Foundation Program is the Pre-degree Foundation Program by applying the curriculum of Curtin University in 1 year at ITC. This one-year international foundation studies includes two semester courses in Foundation Engineering and Science.

The Foundation of Engineering and Science prepares students for undergraduate study in Engineering and Science and Information Technology. In addition to several units that are common to all foundation courses, students study units in Engineering Mathematics, Physics and Chemistry and Programming in C++. The courses are aimed at developing academic diligence, critical analysis, and a raft of generic skills in students. They provide a solid foundation for the students to adapt to university education more confidently, both in terms of level and style of education. Not only follow the Curtin University Curriculum, we also add other activities and courses such as Project and Seminar in order to let our students to start to be involved current technology related to AI and Cybersecurity as a small project to investigate and implement.

Students who obtain satisfactory results are eligible for either admission to a range of undergraduate courses offered in the Faculty of Engineering/Science at any Curtin campus (Malaysia, Perth-Australia, Singapore, etc) or admission to other international programs at ITC (see **Figure 1**).

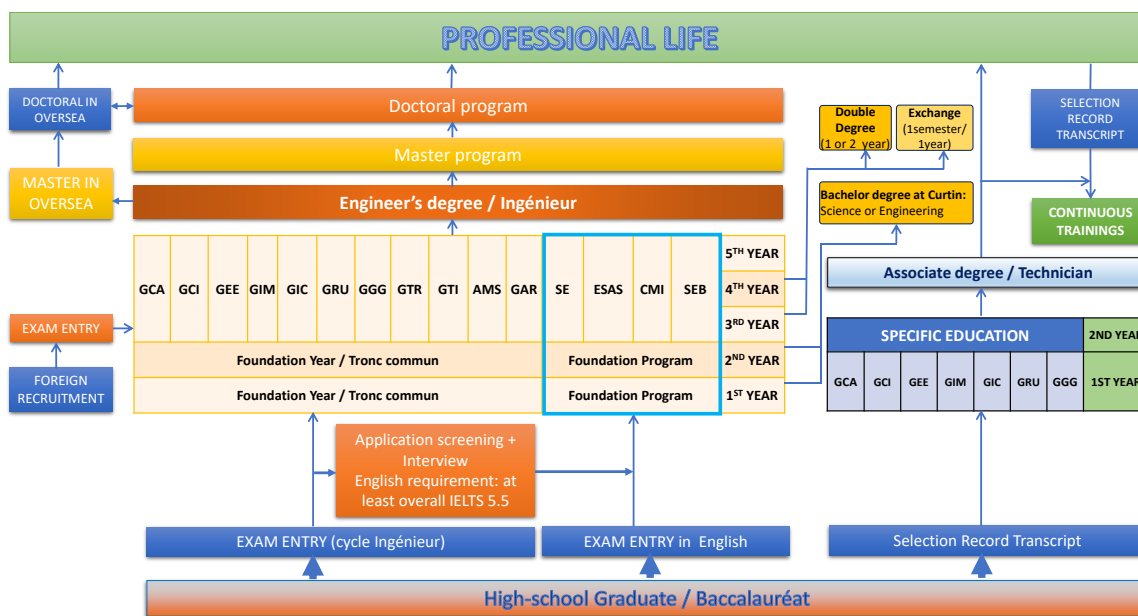


Figure 1 Learning chart of Foundation Program and all international programs at ITC

The course structure of 1 years Pre-degree Foundation in both Engineering and Science stream is shown in tables below. Student who successfully completed the Pre-degree Foundation Program in 1 years at ITC are eligible to pursue undergraduate study offered in any Curtin campus (see in Table 1) and other international programs at ITC (see Figure 1).

Table 1 Course structure of pre-degree foundation program

Engineering Stream		Science Stream	
Unit Offered		Unit Offered	
Semester 1	Semester 2	Semester 1	Semester 2
Effective Communication Skills	Engineering Mathematic II	Effective Communication Skills	Engineering Mathematics II
Engineering Mathematic I	Chemistry for Engineering	Engineering Mathematic I	Writing and Research Skills
Programming C++	Physics for Engineering II	Programming C++	Business Information Technology
Physic for Engineering I	Writing and Research Skills	Physic for Engineering I	Introduction to Business Studies
History		History	

Pathway to degree at Curtin	Bac. of Computing (Software Engineering/Cyber Security)	Pathway to degree at Curtin	Bac. of Technology (Computer system & networking)
	Bac. of Civil and Construction Engineering		Bac. of Applied science (Construction management)
	Bac. of Electrical and Electronic Engineering		Bac. of Science (Applied geology)
	Bac. of Mechanical Engineering	Pathway to degree at ITC	Engineer's Degree of Software Engineering
	Bac. of Chemical Engineering		Engineer's Degree of Electronics and Smart Automation Systems
	Bac. of Mechatronic Engineering		Engineer's Degree of Civil Engineering and Infrastructure Management
	Bac. of Petroleum Engineering		Engineer's Degree of Sustainable Engineering and Business
	Bac. of Environment Engineering		

Note: For ITC, we have added the other course named: Project and Seminar I and II of each semester for students to play along with AI technology and cybersecurity.

Admission process for pre-degree foundation program:

To gain admission to the Curtin Foundation Program, students must have:

For National-High School Graduate:

- Take the entrance exam at ITC
- Meet the English requirement of at least IELTS 5.5
- Application Screening and Interview through the Committee

For International-High School Graduate:

- Take the entrance exam in English at ITC
- Application Screening and Interview through the committee

The 1st year of Foundation Program is followed by the 2nd year of Foundation Program for students who continue their engineer's degree to all international programs at ITC (see **Figure 2**). The detailed course structure of 2nd year of Foundation Program is provided in **Table 2**.

➤ Degree Structure of Engineering Program in Artificial Intelligence Engineering and Cybersecurity

The high-school graduates must take the entrance exam and meet the English requirement (at least IELTS 5.5) before entering in Year 1 and Year 2 (Foundation program). Students need to spend five (5) years to complete their Engineering Program in Artificial Intelligence Engineering and Cybersecurity. After completing Year 1 and Year 2, students could have a choice to pursue their study in Curtin University in Australia or Malaysia. Those students do not want to continue their study abroad so they could also

continue their engineering program Artificial Intelligence Engineering and Cybersecurity at ITC. Students need to spend three (3) years to complete their Bachelor's Degree in Information Technology at Curtin Campus or at ITC. In Year 4 and Year 5 at ITC, students could have the opportunities to do an exchange program within one (1) semester per year in other university partners of ITC such as Curtin Malaysia, University of Grenoble Alpes, University of Toulouse, Le Mans University France, ENSIIE and universitas Pendidikan Ganesha Indonesia. It is not limited to only this universities, it will be flexible based on international MOU of our institute (See **Figure 2**).

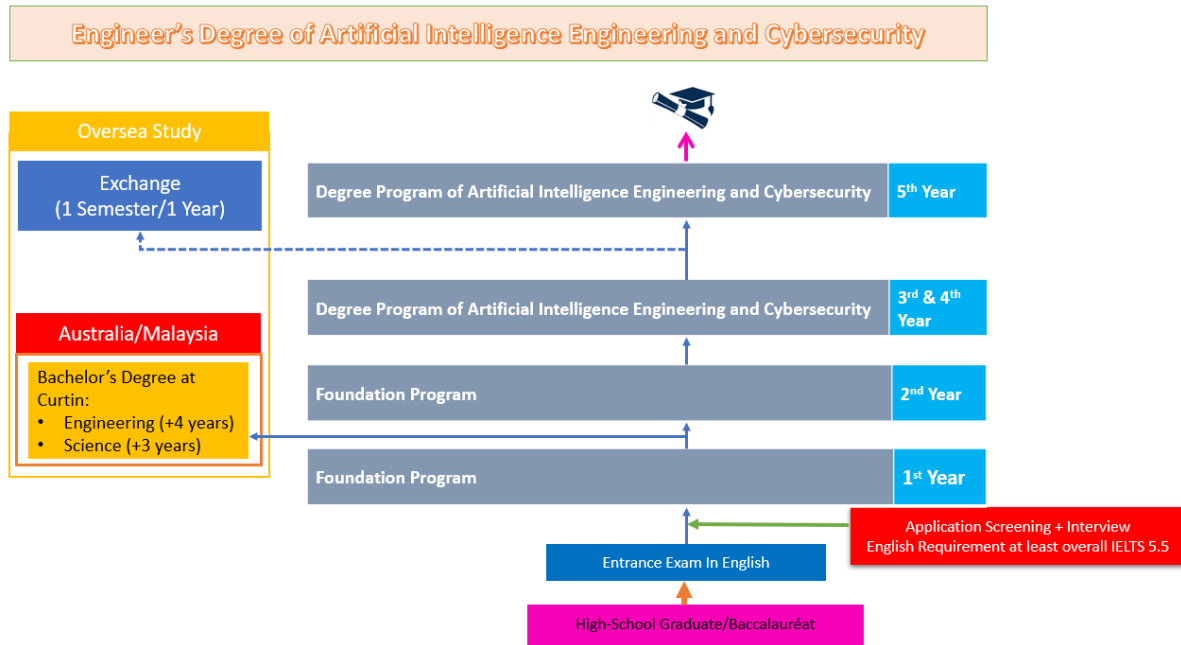


Figure 2 Learning Chart of Engineer's Degree of Artificial Intelligence Engineering and Cybersecurity (AIECS)

2.2. Program Education Objectives (PEOs)

The Engineering Program in Artificial Intelligence Engineering and Cybersecurity under the department of Information and Communication at Institute of Technology of Cambodia prepares students for lifetime careers as productive and innovative engineers adaptive to new situation and emerging programs with utmost awareness of ethical, social and environmental concerns so that, within 5 years after graduation, they will:

- ❖ **PEO1:** Graduates will be able to create, execute, and assess solutions for challenging problems by demonstrating competency in cutting-edge approaches, processes, and technologies related to cybersecurity, machine learning, and artificial intelligence.
- ❖ **PEO2:** Graduates will be capable of successfully communicating and working across disciplines to promote responsible use for the well-being of society. They will also comprehend the ethical issues and societal ramifications related to cybersecurity and AI technology.

- ❖ **PEO3:** Graduates will demonstrate dedication to ongoing learning and career advancement, consistently enhancing their expertise and staying abreast of advancements in AI engineering and cybersecurity to maintain relevance in their professional endeavors.

2.3. Program Learning Outcomes (PLOs)

Engineering Program in Artificial Intelligence Engineering and Cybersecurity under Department of Information and Communication at ITC aims to instill in our graduates the following attributes:

A – KNOWLEDGE

- PLO1: Demonstrate a deep understanding of core concepts and theories in artificial intelligence and cybersecurity.
- PLO2: Identify current trends, emerging technologies, and threats in artificial intelligence and cybersecurity.

B – COGNITIVE SKILLS

- PLO3: Analyze complex problems related to AI and cybersecurity using critical thinking and problem-solving techniques.
- PLO4: Utilize advanced data analysis and machine learning to strengthen cybersecurity strategies to extract valuable insights from data and make informed, data-driven decisions.
- PLO5: Illustrate the adaptability of the rapid evolution of AI and cybersecurity by assessing and adjusting AI algorithms and cybersecurity measures to address new threats, vulnerabilities, and technological advancements.
- PLO6: Understand the core AI and cybersecurity eco-system, including maintaining, monitoring, scaling, enhancing, and troubleshooting the challenges in practical projects to respond to model adaptation and ensure the continued optimal performance and relevance of AI solution.

C – INTERPERSONAL SKILLS AND RESPONSIBILITY

- PLO7: Resolve problems and conflicts taking into account the professional code of ethics and morals of multi cultures.
- PLO8: Perform collaborative tasks efficiently as team members and leaders to deliver high-quality outcomes.
- PLO9: Communicate effectively with diverse people in professional and non-professional audiences and be able to properly provide satisfactory explanations over complexities surrounding the technical problems.
- PLO10: Expose a strong ethical commitment and decision-making in AI and cybersecurity activities to address a deep understanding of ethical dilemmas within these fields, along with the responsibility use of both AI and cybersecurity to make informed ethical decisions and lead others in adhering to ethical guidelines.

D – NUMERICAL SKILLS, INFORMATION TECHNOLOGY AND COMMUNICATION

PLO11: Utilize the latest and existing information and communication technology for numerous ways of communication and comprehend their beneficial functionalities and constraints.

E – PSYCHOMOTOR SKILLS

PLO12: Develop the ability to respond effectively during AI and cybersecurity emergencies through realistic simulations to practice decision-making to ensure readiness for actual incidents.

PLO13: Acquire the ability to diagnose and troubleshoot network infrastructure issues efficiently, ensuring the continuous functionality and reliability of hardware resources that support AI and cybersecurity operations.

2.4. Course hours and credits

For two semesters in each year from 1st year to 5th year, students will take about 10 courses, to fulfill about 30 credits equivalent to more or less 700 hours. Total credits for the program are required about 147 credits (including final year project equivalent to **3032** class hours in total).

The credit to be equivalent with teaching hour as follow:

- 16 hours of teaching course (C) = 1 credit
- 32 hours of tutorial (TD) = 1 credit
- 32 hours of laboratory practice (TP) = 1 credit

2.5. Curriculum of the program

This curriculum is designed for engineering degree which illustrates the whole five years (2 year of Pre-degree foundation + 3 year of degree program) **Engineering Program in Artificial Intelligence Engineering and Cybersecurity** in Department of Information and Communication from 1st year to 5th year. Below is the curriculum of the engineering program in Artificial Intelligence Engineering and Cybersecurity followed by the need analysis that we have discussed in the previous section. Within the first and second year many international programs need to follow the common pre-degree foundation year, starting from year 3 students who choose the engineering program in Artificial Intelligence Engineering and Cybersecurity will follow our specialty curriculum. Curriculum of Engineering Program of Artificial Intelligence Engineering and Cybersecurity in academic year 2024-2025:

Table 2: Curriculum for 1st -5th year:

Year	Semester	No.	Course Code	Course Unit	Credit	L	P	T	Hours	
Y1	S1	1	AIECS001	Effective Communication Skills	2	16	32	0	48	
		2	AIECS002	Engineering Mathematic I	3.5	24	48	16	88	
		3	AIECS003	Programming C++	3	24	48	0	72	
		4	AIECS004	Physic for Engineering I	3	24	32	16	72	
		5	AIECS005	Business Information Technology	2	16	32	0	48	
		6	AIECS006	Project and Seminar I	1.5	8	0	32	40	
			TOTAL Y1S1			15	112	192	64	368
	S2	7	AIECS007	Engineering Mathematic II	3.5	24	48	16	88	
		8	AIECS008	Chemistry for Engineering	3	24	16	32	72	
		9	AIECS009	Physic for Engineering II	3	24	32	16	72	
		10	AIECS010	Writing and Research Skills	2	16	32	0	48	
		11	AIECS011	History	2	32	0	0	32	
		12	AIECS012	Project and Seminar II	1.5	8	0	32	40	
		TOTAL Y1S2			15	128	128	96	352	
		TOTAL YEAR 1			30	240	320	160	720	
Y2	S1	13	AIECS013	Fundamental Concepts of Data Security	3	32	32	0	64	
		14	AIECS014	Integrating Indigenous Science and STEM	3.5	32	48	0	80	

		15	AIECS015	Introduction to Software Engineering	3	32	32	0	64
		16	AIECS016	Programming Design and Implementation	3.5	32	48	0	80
		17	AIECS017	Introduction to Computer Communication and Networks	2.5	32	16	0	48
		18	AIECS018	Project and Seminar I	1.5	8	0	32	40
		TOTAL Y2S1			17	168	176	32	376
	S2	19	AIECS019	Cyber Security Concepts	2.5	32	16	0	48
		20	AIECS020	Data Structures and Algorithms	4	32	64	0	96
		21	AIECS021	Linear Algebra and Statistics for Engineers	3	24	32	16	72
		22	AIECS022	Unix and C Programming	3	32	32	0	64
		23	AIECS023	Project and Seminar II	1.5	8	0	32	40
		TOTAL Y2S2			14	128	144	48	320
		TOTAL YEAR 2			31	296	320	80	696
Y3	S1	24	AIECS024	Object Oriented Programming	3	32	32	0	64
		25	AIECS025	Operating Systems	3	32	32	0	64
		26	AIECS026	Network	3	32	32	0	64
		27	AIECS027	Introduction to Database	3	32	32	0	64
		28	AIECS028	Cyber Crime and Security Enhanced Programming	3	32	32	0	64

		29	AIECS029	Project and Seminar I	1.5	8	0	32	40
		TOTAL Y3S1			16.5	168	160	32	360
	S2	30	AIECS030	System and Network Administration	3	32	32	0	64
		31	AIECS031	Introduction to Artificial Intelligence	3	32	32	0	64
		32	AIECS032	Automata Theory	3	32	32	0	64
		33	AIECS033	Introduction to Cybersecurity	3	32	32	0	64
		34	AIECS034	Introduction to Cryptography	3	32	32	0	64
		35	AIECS035	Project and Seminar II	1.5	8	0	32	40
		TOTAL Y3S2			16.5	136	128	32	296
		TOTAL YEAR 3			33	304	288	64	656
Y4	S1	36	AIECS036	Ethical Hacking and Penetration Testing	3	32	32	0	64
		37	AIECS037	Machine Learning	3	32	32	0	64
		38	AIECS038	Signal Processing	3	32	32	0	64
		39	AIECS039	System and Network Security	3	32	32	0	64
		40	AIECS040	Capstone Project I	3	0	0	96	96
		TOTAL Y4S1			15	128	128	96	352
	S2	41	AIECS041	Software and Web Security	3	32	32	0	64
		42	AIECS042	Computer Vision	3	32	32	0	64
		43	AIECS043	Introduction to Robotics	3	32	32	0	64

		44	AIECS044	Natural Language Processing	3	32	32	0	64	
		45	AIECS045	Capstone Project II	3	0	0	96	96	
		TOTAL Y4S2			15	128	128	96	352	
		TOTAL YEAR 4			30	256	256	192	704	
Y5	S1	46	AIECS046	Deep Learning	3	32	32	0	64	
		47	AIECS047	Risk Management	3	32	32	0	64	
		48	AIECS048	Digital Forensics	3	32	32	0	64	
		49	AIECS049	Secure DevOps	3	32	32	0	64	
			TOTAL Y5S1			12	128	128	0	256
	S2			Internship 1 (year 4)	2					
				Internship 2 (year 5)	9					
			TOTAL Y5S2			11	0	0	0	0
		TOTAL YEAR 5			23	128	128	0	256	
NET					147	1224	1312	496	3032	

2.6. Human Resources

The Institute of Technology of Cambodia has many human resources who got Master degrees and PhD degrees from abroad which are talented in their specific skills that could ensure the quality of teaching. Moreover, we have many staff and students who are still pursuing higher degrees overseas which could be the future potential staff.

Below is the name list of lecturers in the international program in Artificial Intelligence Engineering and Cybersecurity as department human resources and cross-department human resources.

Table 3. Number of staffs in international program in Artificial Intelligence Engineering and Cybersecurity 2024-2025

Degree	2024-2025
PhD	8
Master	15
Total	23

Table 4. List of staff in international program in Artificial Intelligence Engineering and Cybersecurity (AIECS) 2024-2025

No.	Name	Degree	Graduated University	Year
1	VALY Dona	PhD	Université catholique de Louvain (Belgium)	2020
2	KONG PhutPhalla	PhD	Université de Mons (Belgium)	2021
3	PICH Reatrey	Master	King Mongkut's Institute of Technology Ladkrabang (Thailand)	2018
4	SOK Kimheng	Master	INSA de Rennes (France)	2008
5	KHUN Dararith	Master	Institute of Technology of Cambodia	2023
6	LIV Bunthorn	Master	Institute of Technology of Cambodia	2023
7	TAL Tongsreng	Master	Institute of Technology of Cambodia	2018
8	YOU Vanndy	Master	Mahatma Gandhi University (India)	2016
9	SEAK Leng	Master	Institute of Technology of Cambodia	2016
10	KUY Movsun	Master	Institute of Technology of Cambodia	2017
11	BOU Channa	Master	Sirindhorn International Institute of Technology (Thailand)	2018
12	HOK Tin	Master	Chungbuk National University (Korea)	2021
13	HENG Rathpisey	Master	Gadjah Mada University (Indonesia)	2020

14	NOP Phearum	Master	Institute of Technology of Cambodia	2021
15	UN Lykong	Master	Université LYON 1 (France)	2023
16	SRANG Saroth	PhD	Tokyo Institute of Technology (Japan)	2014
17	PEC Rothna	PhD	Chung-Ang University (South Korea)	2017
18	HIN Raveth	PhD	Université de Rennes 1 (France)	2017
19	HOUNG Peany	PhD	Tokyo Institute of Technology	N/A
20	LIN Mongkolserey	PhD	Mahidol University (Thailand)	2014
21	PHAUK Sokkhey	PhD	University of the Ryukyus (Japan)	2021
22	LONG Sovann	Master	Royal University of Phnom Penh	N/A
23	SIEN Bross	N/A	N/A	N/A

2.7. Laboratory Facilities

Infrastructure and facility

The Institute of Technology of Cambodia provides a comfortable study room and laboratory which enables teaching and learning. Moreover, ITC has one small conference hall that could handle 300 people, one big conference hall that could handle 2012 people, and two big tutorial rooms. At the same time, we have a STEM library that contains more than 12000 books, 14 computers, 30 laptops, a self-study room, two symposiums containing 10 small discussion rooms, a showroom and a startup incubation room.

Laboratory

The Institute of Technology of Cambodia provides practical knowledge which is why there are many practical laboratories to support implementation and practical works for teaching and learning.

Table 5. Laboratory in international program in Artificial Intelligence Engineering and Cybersecurity

No.	Type of Laboratory	Devices in the laboratory	Qty	Status
1	Networking	Server machine	13	Functioning
2	Computer room	30 computers	3	New setup
3	Smart room	Smart screen	2	Functioning
4	Laboratory room	Office spaces and equipment	2	Functioning

Equipment Specification

90 Brand new Desktops

Brand New Desktop Computer Acer Veriton VM4680G

- Processor: Core i7-12700 16M Cache (2.50 Up to 4.90GHz)
- RAM: 8GB DDR4 3200Mhz
- Storage: 256GB PCIe M.2 SSD (Boot) + 1TB SATA 7200 RPM
- GPU: GTX 1660 6GB GDDR5
- Wireless: 802.11 ax/ac/a/b/g/n, Wi-Fi 6, and Bluetooth 5
- Monitor: Monitor Acer 19.5" V206HQL
- Optical Drive: Built-in DVD-RW Drive
- Interface Port: 4xUSB 3.2 Type-A, 1xUSB 3.2 Type-C, 4xUSB 2.0 Type-A, Audio Jack 1xPS/2 Port 1x Line-Out, Line-in, SD 4.0 Card, and Gigabit LAN.
- OS: DOS
- Include: UPS ProLink 650VA, English Keyboard, Optical Mouse (3 Buttons and scroll), Configuration, and Installation.
- Warranty: 2 years on part and service.

Annex 13

Detail of modification of Industrial Engineering and Supply Chain Management Program

1. BACKGROUND

Our international programs, Robotics and Automation Engineering, and Industrial Engineering and Supply Chain Management have started in 2021. The programs are under partnership with ECAM LaSalle in Lyon, France. 12, 12, and 15 Cambodian students have enrolled in the first, the second and the third batches respectively. All Cambodian students received scholarships ranging from 30% to 80% of tuition fee, and received scholarships covering flight tickets and accommodation for exchange to study 1 semester in Lyon. There are exchanges of 36 French students to study in our programs as well.

Qualified and self-funded students have an opportunity to study another year in Lyon to get ECAM Engineer's degree which is equivalent to master's degree. Our programs in all campuses have signed double degree agreements at master's degree level with Chiangmai university, Kasetsart university in 2023. It is a great opportunity for those who want to pursue master's degree. And also, every year, there are going to be total number of 15 to 20 student exchange between ITC and the two universities.

The program was designed to response the needs of the Kingdom of Cambodia's industrial sector, which is specifically aligned with the latest policies by the royal government of Cambodia. Therefore, it is opted to regularly improve the curriculum accordingly.

Cambodia Digital Government Policy (2022-2035):

The Cambodia Digital Government Policy outlines strategic goals and actions to enhance digital infrastructure and services. While it primarily focuses on government operations, its principles can extend to the manufacturing sector.

Strategic Goal 1 emphasizes building digital infrastructure, including connectivity and security. A robust digital backbone benefits all sectors, including manufacturing¹

Strategic Goal 2 aims to create digital governance and public services. Implementing digital systems in manufacturing can streamline processes, improve supply chains, and enhance efficiency¹.

Industry 4.0 Opportunities:

A report by the UN Development Programme highlights opportunities for Cambodia's manufacturing industries to adopt Industry 4.0 technologies. Policies that encourage this adoption can drive digital transformation in manufacturing².

¹ [Cambodia Digital Government Policy 2022_2035_English.pdf](#)

² [Industry 4.0: How Cambodia Can Build for The Future | United Nations Development Programme \(undp.org\)](#)

Digital Economy and Society Policy Framework (2021-2035):

The Digital Economy and Society Policy Framework provides a roadmap for Cambodia's digital development. By fostering a conducive environment for technology adoption, it indirectly supports the manufacturing sector's digitalization³.

Postal Sector Development Policy:

While not exclusively focused on manufacturing, the Postal Sector Development Policy contributes to digital infrastructure. Efficient logistics and communication channels benefit manufacturing supply chains⁴.

In summary, Cambodia's digital policies lay the groundwork for a thriving digital ecosystem, which includes the manufacturing sector. By leveraging these policies, Cambodia can propel its manufacturing industry into the digital age, enhancing competitiveness and economic growth.

Table 1: Curriculum of the existing Industrial Engineering and Supply Chain Management program

Year	Semester	Course Code	Subject	Credit	L	T	P	Hours
ECAM3	S1	COMI31054	Mathematics for engineers 5	2	1	1	0	48
		COMI31055	Network & security	1	1	0	0	16
		COMI31056	Strength of materials	1.5	1	0.5	0	32
		COMI31057	Materials 2	1.5	1	0	0.5	32
		COMI31058	Introduction to heat transfer	1.5	1	0.5	0	32
		COMI31059	Electrical machines	1.5	1	0.5	0	32
		COMI31060	Power electronics	1.5	1	0.5	0	32
		COMI31061	Industrial organization	2	1	1	0	48
		COMI31062	Industrial method	1	1	0	0	16
		COMI31063	Ecodesign project 1	2.5	2	0	0.5	48

³ [CAMBODIA DIGITAL ECONOMY AND SOCIETY POLICY FRAMEWORK 2021 - 2035 – ក្រសួងរ៉ែបូរេនេសាវ និង ទាញយក \(mptc.gov.kh\)](#)

⁴ [Press release on the progress of digital policies and regulations in the digital sector in Cambodia | Open Development Cambodia \(ODC\)](#)

		COMI31064	Professional and personal development 5	2	0	2	0	64	
			English 5	1.5	1	0	0.5	32	
			French 5	1.5	1	0	0.5	32	
		Total S1		21	13	6	2	464	
	S2	COMI32067	Mathematics for engineers 6	1.5	1	0.5	0	32	
		COMI32068	Object-oriented programming	1	1	0	0	16	
		COMI32069	Vibration	1	1	0	0	16	
		COMI32070	Control Theory 1	1.5	1	0.25	0.25	32	
		COMI32071	Electrical machine drives	1	1	0	0	16	
		COMI32072	Quality	1	1	0	0	16	
		COMI32073	Ecodesign Project 2	2	1	0.5	0.5	40	
		COMI32074	Professional and personal development 6	2	0	2	0	64	
		ISMI32075	Introduction to industrial and supply chain management	2	1	1	0	48	
		ISMI32076	Industrial Engineering & Project Management	2	1	1	0	48	
				English 6	1.5	1	0	0.5	32
				French 6	1.5	1	0	0.5	32
		Total S2		19.50	12	5.25	2.25	406	
Total Year 3				40.50	25	11.25	4.25	870	
ECAM4	S1	COMI41080	Sustainable management S7	3	3	0	0	48	
		COMI41081	Professional and Personal Development S7	4	4	0	0	64	

		COMI41082	Applied engineering internship (S6)	3	3 (Defense internship report)			
		COMI41083	Innovation project S7	4.5	2.5	2	0	104
		ISMI41084	Manufacturing Digital Transformation	1.5	1	0.5	0	32
		ISMI41085	Global, External and Circular Supply Chain	1.5	1	0.5	0	32
			English 7	1.5	1	0	0.5	32
			French 7	1.5	1	0	0.5	32
		Total S1		22.5	14.5	3	5	408
	S2	COMI42090	Sustainable management S8	1	1	0	0	16
		COMI42091	Research project: management and tools	1	0	0	1	32
		COMI42092	Human & managerial sciences S8	2	0	1	1	64
		COMI42093	Innovation project S8	3	2	1	0	64
		ISMI42094	Industry of the Future	2	0.5	0.5	1	64
		ISMI42095	Sustainable and Integrated Supply Chain	2	0.5	0.5	1	64
			English 8	1.5	1	0	0.5	32
		French 8	1.5	1	0	0.5	32	
Total S2		17	6	3	8	368		
Total Year 4		39.75	20.5	6	13	776		

2. PROPOSE MODIFICATION

Relevance and Streamlining:

- The curriculum overhaul aims to enhance the program's relevance in today's dynamic landscape. By eliminating less pertinent subjects, we ensure that students focus on core competencies directly applicable to digital manufacturing systems.

- Streamlining the syllabus allows students to delve deeper into specialized areas, fostering expertise and practical skills. The goal is to produce graduates who seamlessly integrate into the digital manufacturing workforce.

Industry Demand and Student Engagement:

- The surge in students entering the manufacturing sector underscores the need for tailored education. As more individuals seek careers in this field, the program must adapt to meet their aspirations.
- By aligning with industry demand, we empower students to contribute effectively to the manufacturing ecosystem. Their engagement and success are pivotal for both personal growth and the sector's advancement.

Strategic Partnerships:

- The collaboration with Kasetsart University and ECAM LaSalle in the digital manufacturing system engineering program is a strategic move. It fosters knowledge exchange, research collaboration, and exposure to diverse perspectives.
- Partnerships like these enrich the learning experience, providing students with global insights and networking opportunities.

Modernization and Technological Trends:

- The curriculum's modernization reflects the rapid pace of technological advancements. Digital manufacturing systems rely on cutting-edge tools, automation, and data analytics.
- By incorporating these trends, we equip students with relevant skills, ensuring they remain competitive in an ever-evolving industry.

National Policy and Economic Impact:

- Cambodia's industrial development policy emphasizes digitalization. Our program aligns with this vision, contributing to the nation's economic growth.
- Graduates will drive innovation, enhance productivity, and elevate Cambodia's position in the global manufacturing landscape.

Foundational Knowledge:

- The revamped curriculum emphasizes core principles and theories. Students gain a solid understanding of digital manufacturing, including process optimization, smart factories, and supply chain integration.
- This foundational knowledge prepares them for diverse roles, from production management to technology implementation.

- In summary, the modification isn't merely about rearranging courses; it's a strategic response to industry dynamics, technological shifts, and national imperatives. Our graduates will be well-equipped to shape the future of digital manufacturing.

Table 2: Curriculum of the proposed modified Industrial Engineering and Supply Chain Management Program

Year	Semester	Course Code	Subject	Credit	L	T	P	Hours
ECAM2	S1	Follow all the courses that ITC design in collaboration with Curtin University						
		Total S1						
	S2	DTCI22040	Mathematics for engineers 4	3.5	2.5	1	0	72
		DTCI22041	Simulation & numerical calculation 2	1.75	1.25	0.5	0	36
		DTCI22042	Mechanical design 4 – gearing modelling & force analysis	0.75	0	0.75	0	24
		DTCI22043	Materials 1	1	0.5	0.5	0	24
		DTCI22044	Theory System of Digital Manufacturing Science	1.5	0.75	0.25	0.5	36
		DTCI22045	Manufacturing Informatics	1	0.5	0.5	0	24
		DTCI22046	Digital design & embedded software 2	1	0.5	0	0.5	24
		DTCI22047	Electrical network	1	0.5	0.25	0.25	36
		DTCI22048	Electronics 2 – Functions & applications	0.75	0.5	0	0.25	20
		DTCI22049	Workshops / summer schools – concentration discovery	1.25	0	0	1.25	40
DTCI22050	Sustainable development 4	1	0	0.5	0.5	24		

		DTCI22051	Multidisciplinary project 2	0.75	0.25	0.25	0.25	24
		DTCI22052	Professional and personal development 4	2	0	2	0	64
			English 4	1.5	1	0	0.5	32
			French 4	1.5	1	0	0.5	32
		Total S2		19.75	9.25	6	4.5	488
Total Year 2				37.75	17.25	13	7.5	936
ECAM3	S1	COMI31054	Mathematics for engineers 5	2	1	1	0	48
		COMI31055	Network & security	1	1	0	0	16
		COMI31056	Strength of materials	1.5	1	0.5	0	32
		COMI31057	Materials 2	1.5	1	0	0.5	32
		COMI31058	Introduction to heat transfer	1.5	1	0.5	0	32
		COMI31059	Electrical machines	1.5	1	0.5	0	32
		COMI31060	Power electronics	1.5	1	0.5	0	32
		COMI31061	Industrial organization	2	1	1	0	48
		COMI31062	Industrial method	1	1	0	0	16
		COMI31063	Ecodesign project 1	2.5	2	0	0.5	48
		COMI31064	Professional and personal development 5	2	0	2	0	64
			English 5	1.5	1	0	0.5	32
			French 5	1.5	1	0	0.5	32
	Total S1		21	13	6	2	464	
	S2	COMI32067	Mathematics for engineers 6	1.5	1	0.5	0	32
		COMI32068	Object-oriented programming	1	1	0	0	16

		COMI32069	Vibration	1	1	0	0	16
		COMI32070	Control Theory 1	1.5	1	0.25	0.25	32
		COMI32071	Electrical machine drives	1	1	0	0	16
		COMI32072	Quality	1	1	0	0	16
		COMI32073	Ecodesign Project 2	2	1	0.5	0.5	40
		COMI32074	Professional and personal development 6	2	0	2	0	64
		ISMI32075	Introduction to Supply Chain Management	2	1	1	0	48
		ISMI32076	Industrial Engineering & Project Management	2	1	1	0	48
			English 6	1.5	1	0	0.5	32
			French 6	1.5	1	0	0.5	32
		Total S2		19.50	12	5.25	2.25	406
Total Year 3				40.50	25	11.25	4.25	870
ECAM4	S1	COMI41080	Sustainable management S7	3	3	0	0	48
		COMI41081	Professional and Personal Development S7	4	4	0	0	64
		COMI41082	Applied engineering internship (S6)	3	3 (Defense internship report)			
		COMI41083	Innovation project S7	4.5	2.5	2	0	104
		ISMI41084	Manufacturing Digital Transformation	1.5	1	0.5	0	32
		ISMI41085	Global Supply Chain and Information System	1.5	1	0.5	0	32
			English 7	1.5	1	0	0.5	32
			French 7	1.5	1	0	0.5	32
		Total S1		22.5	14.5	3	5	408

	S2	COMI42090	Sustainable management S8	1	1	0	0	16
		COMI42091	Research project: management and tools	1	0	0	1	32
		COMI42092	Human & managerial sciences S8	2	0	1	1	64
		COMI42093	Innovation project S8	3	2	1	0	64
		ISMI42094	Industry of the Future	2	0.5	0.5	1	64
		ISMI42095	Robust Supply Chain	2	0.5	0.5	1	64
			English 8	1.5	1	0	0.5	32
			French 8	1.5	1	0	0.5	32
		Total S2				17	6	3
Total Year 4				39.75	20.5	6	13	776
Y5 (M1)	S1	COMI51098	Minor Project	2	0	0	2	64
		COMI51099	Major Project	2	0	0	2	64
		ISMI51100	Course 1 to prepare for M1	2	1	1	0	48
		ISMI51101	Course 2 to prepare for M1	2	1	0.5	0.5	48
		ISMI51102	Course 3 to prepare for M1	2	1	0.5	0.5	48
	S2	Internship	9	0	0	9	--	
Total Year 5								
Total (Y1 to Y5)				154 > 120	81.5	43	29.5	3456

Annex 14

Detail of proposal for Master Program of Architectural Engineering

1. BACKGROUND

According to survey questionnaire among 170 graduated students and final year students, about 70% of them expressed their support and are interested in studying the master's degree of architecture by strongly arguing that the master program can really improve their knowledge of conceptual theory, sustainability and building information modelling (BIM) and train their skill in career practices,

Among 15 national and international companies, the survey showed that they strongly support for ITC to open a master 's degree in architecture and there are 8 companies which have mostly one or two architects holding master and 2 companies which have one architect holding Ph. D. degree. The other companies employed only architects holding bachelor's degrees. This explain that the availability of master architects is very limited, and today's demand is so high that ITC should take this opportunity to launch this master program.

Besides the survey of demand of architects holding master's degree, 7 companies did support by stating their interest and support to ITC for opening master's degree in architectural engineering. All support letters are attached.

In opening this master program, ITC have worked closely with professors specialized in Architectural Engineering from the University of Liège and University Libre of Brussel. In COMBOD'IA, Professor Piere LECLERCQ and Prof. Samia BEN RAJEB accept 3 PhD students to learn and do research for the field in order to form human resources, established a virtual bureau of architecture and improve the curriculum Bachelor of Architecture Engineering and propose a new Master of Architectural Engineering this year.

MASTER PROGRAM OF ARCHITECTURAL ENGINEERING

The Master Program of Architectural Engineering aims to build competent human resource for the construction sector. The mission, vision, value, curriculum structure, and staff are as follows:

Mission

The master program missions are as follows:

- Educate and train students to become highly skilled professionals in the field of architectural engineering.
- Equip students with the knowledge, skills, and expertise needed to address complex challenges in architecture and engineering in both regional and international level.
- Prepare to make significant contributions to the advancement of the architectural engineering field and to meet the evolving needs of society in term of science and technologies.
- Foster creativity, innovation, and sustainability in architectural design and construction practices
- Support the research unit of built design and built environment of ITC

Visions

The visions of this master program are as follows:

- Build a strong cooperation with industries and public sector in construction fields as well as other stakeholders.
- Continue cooperating with universities in the region and internationally to provide students an excellent education and more opportunities in exchange Master program with other universities and pursuing PhD degrees.
- Build highly competent human resources.

2. PROGRAM OF MASTER OF ARCHITECTURAL ENGINEERING

2.1 Program Education Objectives (PEOs)

The Master Program of Architectural Engineering at Institute of Technology of Cambodia prepares students for lifetime careers as productive and innovative engineers adaptive to new situation and emerging programs with utmost awareness of ethical, social and environmental concerns so that, within five years after graduation, they will be able:

- PEO1:** Apply knowledge of science, mathematics, civil, engineering principles, and other relevant fields of studies to solve complex engineering problems.
- PEO2:** Solve complex problems based on investigation or research using the integration of knowledge and the consequent responsibilities relevant to professional practice.
- PEO3:** Ability in engineering, management, and finance principles in managing projects
- PEO4:** Function effectively as an individual or in a team to achieve common goals in diverse teams and in multi-disciplinary settings
- PEO5:** Understand the impact of engineering decisions and apply professional ethics for sustainable development.

2.2 Outcome Standards and Program Learning Outcomes

Master of Architectural Engineering at Graduate School of ITC aims at grooming future engineers with capability based on the Outcome Standards and Program Learning Outcomes. The Outcome Standards (OC) include the knowledge, cognitive skills, interpersonal and responsibility, numerical skills, information technology and communication, and psychomotor skills. Table 1 summarizes the Outcome Standards. The Program Learning Outcomes (PLO) consist of ten (10) elements presented in Table 2.

Table 1: Outcome Standards for Master Program

Outcome Standard	Outcome Title	Program Learning Outcomes (PLO)
OC1	Knowledge	PLO1, PLO2, PLO3, PLO4

OC2	Cognitive Skills	PLO5, PLO6, PLO7
OC3	Interpersonal and Responsibility	PLO8
OC4	Numerical Skills, Information Technology and Communication	PLO9
OC5	Psychomotor Skills	PLO10, PLO11

Table 2: Program Learning Outcomes for Master Program

Program Learning Outcomes (PLO)	Title	Description
PLO1	Scientific and Research	Ability to apply knowledge of scientific research related to architecture, engineering, and technology concerns.
PLO2	Architectural Engineering Knowledge	Ability to apply knowledge of science, technology, architecture, engineering principles, and other relevant fields of study to solve complex engineering problems.
PLO3	Design Strategies and Tools	Developing design strategies involves implementing methods and utilizing tools that support architectural design, ensuring a comprehensive and effective approach.
PLO4	Urban Design and Sustainable Development	Ability to design on an urban scale with application of sustainable strategies for less environmental impact.
PLO5	Innovative, Critical and Analytical Thinking	Ability to analyze, evaluate, and synthesize that enable to approach problems, ideas, and situations with creativity, discernment, and in-depth.
PLO6	Problem Solving	Ability to identify, analyze, evaluate, and solve problems related to architectural design, engineering and environmental impact.
PLO7	Soft Skill	Ability to communicate and collaborate in a teamwork environment with leadership skills.

PLO8	Management skill	Ability to organize, plan, and manage construction projects.
PLO9	Numerical Practice	Ability to learn and adapt with new technology and numerical innovation.
PLO10	Reflex skills and professional practice	Ability to have quick reflex skills and professional practicing through their workshop, and project.
PL11	Balancing theoretical knowledge and experience	Balancing theoretical knowledge and experiences in the project and complete the task effectively.

2.3 Course hours and credits

The curriculum of the Master Program of Architectural Engineering is prepared for students graduating within two (2) years. The total credits for completing this program are at least 65. There are 27 courses that students must enroll in within 2 years (for students that come from the other university). For students who graduated from ITC, there are 8 courses that they must enroll in starting from year 2 of Master Program. Each course includes the total hour for study (T. HR) per semester for coursework (C), tutorial (T), and practice (P).

The credit to be equivalent with teaching hour as follow:

- 16 hours of teaching course (C) = 1 credit
- 32 hours of tutorial (TD) = 1 credit
- 32 hours of laboratory practice (TP) = 1 credit

2.4 Curriculum Structure

Both students graduated from ITC and from other universities are eligible for this Master of Architectural Engineering. They will be screened and do the master. The students graduated from ITC shall be screened based on their GPA before accepting into M2, M1 are integrated in Year 4 and Year 5 however the students graduated from other universities shall be screened based on their score records in order to define if they need to do full M1 or only a supplementary list of few courses for first year and M2 for second year.

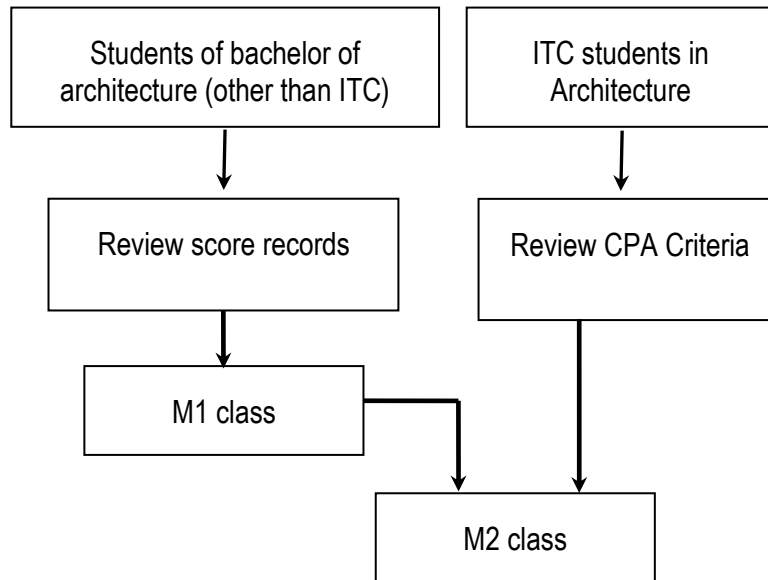


Figure 1: Curriculum Structure of Master Program of Architectural Engineering

2.5. Curriculum of Master Program of Architectural Engineering

This is the detail of curriculum for Master of Architectural Engineering discussed and proposed for 2 years.

Table 3: Total course and credit for Master Program of Architectural Engineering

N°	Course descriptions	Corse code	Course	TD	TP	Credits
M1GAR-S1			384			
1	Materials of constructions		16	0	32	2
4	Cost Estimation	GARI51MET	16	0	0	1
5	Thesis Writing and Research Methodology	GARI51MRT	16	0	0	1
6	Project Management	GARI51GES	16	32	0	2
8	Stability of Tall Building	GARI51SBG	16	0	0	1
9	Urban Planning II	GARI51URB	16	0	32	2
10	Architectural Design Workshop III (Monofunctional Building)	GARI41ATA	16	0	64	3
SUB-TOTAL			112	32	128	12
M1GAR-S2			272			
1	Architectural Design Workshop IV (Integrated Project)	GARI42ATA	16	0	64	3

	2	Interior Design	GARI42DIN	16	0	32	2
	3	Urban Regulations and Laws	GARI42RUD	32	0	0	2
	5	Urban Planning I	GARI42URB	16	32	0	2
	6	External Works (Building Services)	GARI42VRD	16	0	0	1
	8	Mechanics of Structure I	GSCM12MOS	32	0	32	3
SUB-TOTAL				128	32	128	13
M2GAR-S1				288			
	1	Workshop VI (sustainable, integrated project in Cambodia context, international jury)	GSCM21ATA	32	0	96	5
	2	Building Information Management (BIM)	GSCM21BIM	16	0	0	1
	3	Strategic Management/Construction Project Management	GSCM21SCP	16	0	0	1
	4	Sustainable Development and Smart City	GSCM21SDS	16	0	32	2
	5	Life Cycle Approach to Sustainable Building	GSCM21LCA	16	0	32	2
	6	Urban Planning and Management	GSCM21UPM	16	0	32	2
	7	Built Environment in a Resource Conservation Perspective	GSCM21BRC	16	0	32	2
	8	Master Thesis Writing and Introduction to Research Methodology	GSCM21TRM	32	0	0	2
				160	0	224	
SUB-TOTAL							17
M2GAR-S2							
	10	Master Thesis	GSCM2			540	12
SUB-TOTAL							12
Total				400	64	1020	54
				1484			

2.5. Human Resources

The current human resources can be employed actively for launching the program with some help in situ or online from Belgian experts in the field of architectural engineering. The local list of teachers is as follow:

Table 4. Human resources of Master Program of Architectural Engineering

No	Name	Degree	Graduated in year	Field of Expertise
1	Han Virak	Ph. D.	2006	Civil Engineering
2	Hash Chanly	Master	2008	Architectural Engineering: Urban and Regional Planning
3	Keth Kannary	Master, Ph. D candidate	2020	Architectural Engineering
4	Leu Leanghong	Master	2023	Architecture in Program Building Technology
5	Taing Kimnenh	Master, Ph. D candidate	2020	Architectural Engineering
6	Long Makara	Master, Ph. D candidate	2021	Architectural Engineering, professional focus in architectural and urban engineering
7	Venh Lay Ou	Master	2023	Architecture, research direction: sustainable urban design
8	Thai Srun	Bachelor	2002	Urban Management
9	May Raksmeay	Doctor of Engineering	2010	Urban and Environmental Engineering, Project Management

Annex 15

Detail of proposal for revising the name of a research unit (from MSS to MBE)

The Materials Science and Structure Research Unit focuses on research and innovation trends in engineering and construction materials, especially low-carbon impact materials and lightweight structures. This includes geotechnical engineering, underground structures, structural engineering, minerals, polymers, ceramics, and alloys to address specific needs in Cambodia. The research unit also pays attention to the field of Architectural Engineering, particularly in studies related to affordable housing.

While the activities conducted in the Architectural Engineering field are already part of MSS, the unit's name is not reflected in this field. Therefore, a modification is proposed. After discussions among our team and partners, the new name "**Materials and Built Environment**" (MBE) has been suggested. The purpose of this modification is to integrate relevant research fields such as architectural engineering, transportation, logistics, and others into this research unit. Using the right terminology is crucial to raise awareness among the public and students, encouraging them to apply in this field, and promoting collaboration with professional stakeholders.

Currently, there are 3 senior researchers, 3 full-time researchers, and 2 potential lecturer researchers working in this field. Additionally, there are 5 ongoing research projects. The research themes in architectural engineering include but are not limited to:

- Integrated and instrumented design
- Bioclimatic construction
- Sustainable design
- Building Information Modeling/Management (BIM)
- Collaborative design
- Urbanization principles

The activities and management structure that have been conducted previously remain the same. The intention of this revision is to emphasize that relevant research fields can be accommodated within this unit for public awareness and to promote research collaboration.

Annex 16

Research projects implementing in 2023-2024

➤ Number of research projects implementing in 2023-2024

The first 27 research projects are new projects, whereas other 64 projects are continuing from previous year.

No.	Name of PI	Sex	Title	Period	Budget
1	Dr. OR Chanmoly	M	Accelerating Digital Transformation for Higher Education Institutions in Southeast Asia (DX.SEA)	2023-2025	Erasmus+
2	Dr. YOEU Sereyvath	M	Production of Organic-Mineral Fertilizers from Local Raw Materials	2023-2024	MoEYS
3	Mrs. SIENG Sreyvich	F	Assessment of Air Quality and Impact in Potential Areas in Cambodia	2023-2026	JICA/JST
4	Dr. TAN Reasmey	F	Development of Oyster Sauce from Cambodian Oysters and Green Mussels for Commercialization	2023-2024	CAPFish-UNIDO-EU
5	Dr. MITH Hasika	M	Health Risk Assessment and Quality Improvement of Cambodian Smoked Fish	2023-2024	CAPFish-UNIDO-EU
6	Dr. IN Sokneang	F	Improvement on Quality, Safety, and Shelf-Life (including Packaging) of Fermented Pangasius Fish for Accessing to New Markets	2023-2024	CAPFish-UNIDO-EU
7	Dr. PENG Chanthol	F	Feasibility Study of Siem Reap's Prahok toward Geographical Indication: History, Technology, and Quality	2023-2024	CAPFish-UNIDO-EU
8	Dr. IN Sokneang	F	Study on the Effect of Steam Conditions (Temperature, Time, and Green Mussel Size) on the Organoleptic Quality and Safety Quality of Green Mussels	2023-2024	CAPFish-UNIDO-EU
9	Dr. SUONG Malyna	F	Laboratory of Excellence in Co-Engineering for Sustainable Agrosystems	2024-2028	IRD
10	Dr. SUONG Malyna	F	Promoting Integrated Pest Management and Sustainability of the Fragrant Rice Quality in Cambodia by Valorization of Native Microbiota	2024-2026	Ministry of Europe and Foreign Affairs (via The Embassy of France)

11	Dr. SUONG Malyna	F	Soil-Borne Legacy and Microbiota-Mediated Disease Resistance in Rice-Based Systems in Cambodia	2024	Agropolis Fondation
12	Dr. SUONG Malyna	F	Training in the Use of Molecular Tools for Diagnosis of Rice Diseases to Support the Transition towards Integrated Pest Management	2024-2026	IRD
13	Dr. VALY Dona	M	Integrated Decision Support System for Non-Communicable Ocular Diseases using Machine Intelligence	2023-2024	ASEAN IVO
14	Ms. OUM Sotheara	F	Development of Autonomous and Semi-Autonomous Mobile Robots to Participate in Robocon 2024	2023-2024	Takahashi Foundation
15	Dr. KAN Kuchvichea	M	Evaluation Technico-Socio-Economique des Infrastructures Routières au Cambodge	2023-2025	ARES
16	Mr. SOM Chansamng	M	Effect of the Addition of Natural Fibers on Shrinkage, Cracking Risk and Healing Capacity of Cementitious Materials	2023-2026	BGF-MoEYS
17	Dr. PROK Narith	M	Performance of Tyfo(R)FibrAnchor under Axial Load	2023-2024	Fyfe Asia
18	Dr. OEUNG Thaileng	M	Investigation of Steel-Concrete Composite Structural Elements under Various Loadings	2023-2024	TMU
19	Dr. YOS Phanny	M	FSPI-R: Metal-related Skill and Create Link with Archeo-Metal Activities in Cambodia	2023-2024	French Embassy
20	Mr. SOK Sereyvathana	M	Removal of Organic Micropollutants by Coupling Simultaneous Continuous Adsorption and Sedimentation for Drinking Water Production	2023-2026	BGF & MoEYS
21	Dr. THENG Vouchlay	F	Photoproduction of Radicals and their Effects on Carbon Dynamics in Tropical Lakes (JSPS-Photochem)	2023-2027	JST
22	Dr. SOK Ty	M	Development and Social Implementation of Greenhouse Gas Emission Reduction Technologies in Paddy Fields of West Tonle Sap Lake by Establishing a Large Paddy Area Water Management System	2024-2028	JST/JICA

23	Dr. SOK Ty	M	Integrated River Basin Management of the Mekong Basin Tributary for Adaptation to Climate Change	2024-2027	Mekong Korea Cooperation Fund (MKCF)
24	Dr. BUN Saret	M	Stopping Macro- and Microplastic Pollutants by Installing Solar-Powered Air Bubble Screening (SBS) Device at Discharge Wastewater Canal to the Sea of Sihanoukville, Cambodia	2024	UNDP
25	Dr. BUN Saret	M	Rural Community Training on Safe Water Quality and its On-Site Demonstration Testing	2024	SUMERNET
26	Dr. BUN Saret	M	Addressing Water Scarcity through Groundwater Use: Development of Solar-Powered Groundwater Treatment System for Remote Area of Cambodia	2024-2025	MTT-RRP
27	Dr. Ratha MUON	F	Réhabilitation et Gestion Durable de la Fertilité des Sols pour Uneagriculture Durable et Résiliente au Cambodge (ReaSol)	2023-2025	IRD
28	Dr. OR Chanmoly	M	Optimization of Algae Cultivation for Biofuel Production in Cambodia	2023-2024	LBE-JICA
29	Mr. CHHLONH Chhith	M	Optimal Fault Location, Isolation, and Restoration Procedure for LV Microgrids	2021-2024	BGF
30	Mr. SORN Darong	M	Optimal Energy-Management System in Smart-Building	2023-2024	LBE-JICA
31	Dr. VAI Vannak	M	Development of a Virtual Cambodian Power System-Towards an Innovation Micro-Grid in Cambodia	2020-2024	HEIP
32	Dr. OR Chanmoly	M	Applied Geophysics for Investigating Hydrocarbon Potential and Depositional Environment of Sediments at Onshore Prospect, Southern Cambodia	2021-2023	HEIP
33	Dr. KRET Kakda	M	Investigation the Production Potential of the Cambodian Offshore Reservoir Considering Effects of Phase Behavior and Rock-fluid Interaction	2021-2023	HEIP
34	Dr. ENG Chandoeun	M	Quality Assurance of Concrete Pile Integrity Soil Properties Investigation in Phnom Penh City using Seismic and Electrical Resistivity Tomography Approaches	2021-2023	HEIP

35	Dr. VONGCHANH Kinnaeth	F	Study on Impact of Heat Stress to Human Productivity and Economic in Cambodia	2020-2023	CCCA3
36	Dr. VONGCHANH Kinnaeth	F	Energy Manager and Auditor Training Program	2020-2023	UNDP
37	Dr. KHON Kimsromn	M	Optimal Energy-Management System in Smart-Building	2023-2024	JICA-LBE
38	Dr. SUONG Malyna	F	Biotechnology for Integrated Pest Management towards pesticide reduction in Cambodia	2019-2023	HEIP
39	Dr. IN Sokneang	F	Valorization of High-Value Dry Food Products (Agricultural Products including Herbal and Spices) and Other By-products in Cambodia	2019-2023	HEIP
40	Dr. MITH Hasika	M	Improvement and Development of Rice-Based Products toward the Growth of SMEs/Industries in Cambodia	2019-2023	HEIP
41	Dr. TAN Reasmey	F	Development of Cambodian Soy Sauce by Fermentation Method	2019-2023	HEIP
42	M. KONG Sela	M	Development of Cooking Oil Processes for Commercialization	2021-2023	HEIP
43	Dr. PENG Chanthol	F	Improvement and Development of Fish and Meat Products for Better Preservation using Innovative Technology	2021-2023	HEIP
44	Dr. HOUNG Peany	F	Valorization of Agricultural By-Products in Cambodia through Extractions and Formulations of Essential Oils and Bioactive Compounds	2021-2023	HEIP
45	Dr. HOUNG Peany	F	Agroecology and Safe Food System Transitions (ASSET)	2020-2025	EU/AFD and GRET
46	Dr. PENG Chanthol	F	Reducing Foodborne Pathogen Contamination of Vegetables in Cambodia: Innovative Research, Targeted Interventions, and Impactful, Cambodian-Led Engagement	2020-2024	USAID
47	Dr. YOEUEN Sereyvath	M	ASEAN Network for Green Entrepreneurship and Leadership/ ANGEL	2021-2024	Erasmus+
48	Ms. CHIN Lyda	F	Impact of Initial Composition and Processing Techniques on Aromatic Quality of Mango	2021-2024	BGF & MoEYS,

					Tonle sap project
49	Dr. MITH Hasika	M	Development of High Nutritional Value Farmed Fish and Safe Processed Products (Smoked and Fermented Fish) in Cambodia	2022-2027	ARES
50	Dr. SUONG Malyna	F	Health of Plants in their Socio-Ecological Ecosystem (Plant Health)	2022-2024	GDA (MAFF)
51	Dr. SUONG Malyna	F	Deciphering the Function of the Plant Parasitic Nematode Microbiome in Suppressive Soils (DEPPAS)	2022-2024	Agropolis Fondation
52	Dr. IN Sokneang	F	Improving Fresh-Water Fish Powder Production for Versatile Use in Cambodian Diets	2023-2024	CAPFish-UNIDO-EU
53	Dr. HOUNG Peany	F	Improvement of Dried Fish Quality through Drying Technology Development	2023-2024	CAPFish-UNIDO-EU
54	Ms. NET Marinich	F	Development of Instant Fish Soups for Commercialization	2023-2024	CAPFish-UNIDO-EU
55	Dr. EK Pichmony	F	Development of Nutrient-Dense Waffle Rolls for Children by Incorporating Cambodian Freshwater Fish Powder	2023-2024	CAPFish-UNIDO-EU
56	Dr. MORM Elen	F	Shelf-Life Improvement and Development of Fish Jerky Products	2023-2024	CAPFish-UNIDO-EU
57	Dr. VALY Dona	M	Ancient Manuscript Digitization and Indexation	2020-2023	HEIP
58	Dr. PEC Rothna	M	Toward Product Innovation via FabLab-ITC	2020-2024	HEIP
59	Mr. CHHORN Sopheaktra	M	Controller System for Smart Greenhouse	2022-2023	HEIP+YG
60	Mr. CHHORN Sopheaktra	M	SOLAGEO's Internet of Energy	2022-2023	HEIP + Trade without Border
61	Dr. THOURN Kosori	M	Initiative towards Electrical and Electronic Product Testing and Certification by EMC Laboratory	2019-2024	HEIP
62	Dr. KIM Bunthern	M	Contribution to the Optimal Design, Control and Diagnostic of an E-tuk-tuk	2021-2024	HEIP
63	Mr. KUY Movsun	M	Investigation of Configuration Issues Related to SDN/NFV Deployments	2020-2024	ARES

64	Mr. CHIN Chan Daraly	M	The Vehicle as an Intelligent Thing	2022-2025	N/A
65	Dr. SRANG Sarot	M	Development of APSARA-1 (2U CubeSat) Engineering Model	2022-2024	MoEYS
66	Mr. TEP Sovichea	M	Smart Mushroom Control System Development	2023-2024	iDE
67	Dr. CHHIT Saosometh	M	Experimental Identification of Hardening Behavior of G300 Steel Grade	2023-2024	JICA-LBE
68	Mrs. AUN Srean	F	Development of Starch-Based Film for Biodegradable Packaging Using Cambodian Cassava as Starch Source	2023-2024	Takahashi
69	Ms. AUN Srean	F	Air Pollution in Phnom Penh/East Asia-Nanoparticle Monitoring Network (EA-Nanonet)	2011-Present	Kanazawa University
70	Ms. KETH Kannary	F	Managing the Interdisciplinary Collaboration in Construction 4.0: ITC's Workshop Case	2020-2024	ARES
71	Ms. TAING Kimnenh	F	Green BIM - Analysis of BIM Approach for Designing a Bioclimatic Building	2020-2024	ARES
72	Mr. LONG Makara	M	Sustainable Building Designs Integrated Life-Cycle Assessment (LCA), for Best Strategies to Design the Green Residential Building in Phnom Penh, Cambodia	2021-2025	ARES – COMBOdIA Project
73	Dr. PROK Narith	M	Performance of Tyfo(R)FibrAnchor under Axial Load	2023-2024	Fyfe Asia
74	Dr. DOUNG Piseth	M	Energy-Based Design for Buildings and Steel Ring Damper for Seismic Application	2020-2024	KMUTT
75	Dr. DOUNG Piseth	M	Initiative on the Development of Wind Load for Design of Building Structures in Cambodia	2021-2023	HH HEIP
76	Dr. HIN Raveth	M	Chemical Strengthening of Large-scale Glass Pieces for Construction and Other Engineering Applications	2020-2023	HEIP
77	Dr. PROK Narith	M	Performance of FRP Anchor Embedded into Concrete Cylinder	2022-2023	Fyfe Asia
78	Dr. OR Chanmoly	M	SATREPS: Establishment of Risk Management Platform for Air Pollution in Cambodia	2022-2027	JICA-JST
79	Dr. THENG Voulay	F	Preventing Zoonotic Diseases Emergence	2022-2027	AFD-RD

80	Dr. SANG Davin	F	Development of Electrocoagulation-Floatation (ECF) Reactor for Removal Turbidity, Color, and Oil & Grease from Slaughterhouse Wastewater	2023-2024	JICA/LBE
81	Dr. HEU Rina	F	Development of Locally-Produced Ceramic Pot Filter for Household Groundwater Purification in Rural Cambodia	2023-2024	JICA/LBE
82	Dr. TY Boreborey	F	Development of Monitoring and Controlling of IoT Based Aquaponics System using Green Energy (Acronym: Smart Aquaponics Project)	2023-2024	JICA/LBE
83	Dr. PEN Sytharith	M	Ecosystem-Base Adaptations for Sustainable Groundwater Resources Management in the Transboundary Cambodia-Vietnam Mekong Delta Aquifer, Lower Mekong Region (GEBA)	2022-2023	Stockholm Environment Institute (SEI)
84	Dr. HANG Leakhena	F	Development of a Bio-Filter System Model to Control Air Pollution toward Industrial Application	2021-2023	HEIP
85	Dr. HEU Rina	F	Improving Sustainable Water Supply and Sanitation in Cambodia: Case of Tonle Sap Lake's Floating Villages	2021-2023	HEIP
86	Dr. KET Pinnara	F	Integrated Approach of Precise Irrigation and Sustainable Soil Management to Improve Crop Water Productivity in Cambodia through ITC Soil Laboratory Development: The Focus on Rice Farming	2021-2023	HEIP
87	Dr. BUN Saret	M	Development of Eco-Friendly and Low-Cost Wastewater Treatment System as an On-Site Product	2021-2023	HEIP
88	Dr. SONG Layheang	M	Development of Climate Data Information System for Cambodia	2021-2023	HEIP
89	Dr. OEURNG Chantha	M	Strengthening Flood and Drought Risk Management and Early Warning System in Lower Mekong Basin of Cambodia	2021-2023	HEIP
90	Dr. CHAN Rathborey	M	Development of Electrocoagulation Reactor Integrated Sedimentation for Turbidity and Color Removal from Industrial Wastewater	2021-2023	HEIP
91	Dr. KET Pinnara	F	Prototype of Low-Cost and Smart In-vessel Composter for Converting Spent Mushroom Substrates to Bio-Organic Fertilizer	2021-2023	HEIP

➤ **Number of Projects/Proposals submitted 2022-2023**

No.	Title of Project	Speciality	Partner	Funding agency (Erasmus KA1, Erasmus KA1, AUN- SEED/Net, AUF, AFD, ADB, WB etc.,)	Funding Amount (USD)
1	Development of The Sustainable on Energy Solution Consultation Unit (SES_ITC)	ETM	N/A	LED	500,000 USD
2	Low-Cost Smart Energy Saving Devices for Residential and Industrial Applications	ETM	N/A	MoEYS (RCI fund)	25,000 USD
3	Application of Packaging Techniques to Extend Shelf Life of Fish-Vegetable Powder Product	FTN	Haiyat Handicraft	Capfish, UNIDO-EU	13,700 USD
4	Assessment of Existing Packaging Applications and their Impacts on the Quality of Processed Fish Products Available in Cambodian Markets	FTN	N/A	Capfish, UNIDO-EU	7,673 USD
5	Ending Plastic Pollution in Cambodia	FTN	Impact Hub	USAID	18,000 USD
6	Development of Compostable Bags from Cambodia Cassava	FTN	N/A	MoEYS (RCI fund)	53,000 USD
7	Cross-Sectional Study on Infection Control in Neonatal Care Units in Cambodia: Environmental Assessment by Bacterial Culture Examination	FTN	N/A	USAID	5,000 USD
8	Formulation and Evaluation of Active Film using Cassava Starch and Cabbage Leave Extracted	FTN	N/A	LBE-JICA	20,000 USD
9	Production of Collagen from Fish Processing Wastes Targeting Zero Waste Strategy	FTN	THOEUN SREYNY Handicraft	Capfish, UNIDO-EU	15,000 USD
10	Development of an AI-Powered Nutritional Program for Public and Private Schools to Reduce Malnutrition in Cambodia	FTN	Mahidol University (Thailand)	MoEYS (RCI fund)	150,000 USD
11	Development of Natural Bioactive Soap using Cambodian Local Plants	FTN	N/A	MoEYS (RCI fund)	20,000 USD
12	Improving of Processing Technique to Enhance the Quality of Smoked Fish Concerning Carcinogenic Chemical Contaminants	FTN	Liege University	MoEYS (RCI fund)	36,070 USD
13	Development of Functional Beverages with Improved Nutritional and Sensorial		CSL enterprise, Aprati Foods	MoEYS (HEIP 2)	1,268,000 USD

	Properties toward Local Economic Growth through Diversifying Cambodia's Agriculture Products	FTN			
14	Establishment of Cyclic Agricultural Platform (C-Agri) by Adopting Life Mechatronics in Cambodia	MIT	University of Fukui, Oita University, Tokyo Polytechnic University, Tokyo Institute of Technology, Tohoku University, The University of Tokyo, Tokushima University	SATREPS	N/A
15	Innovative Production Line for Smart Electronic Devices for Regional Products and Applications	MIT, ETM	N/A	MoEYS (HEIP2)	1,300,000 USD
16	Design and Implementation of Health Data Uploading for Rural Area using AI	MIT	N/A	MoEYS (RCI fund)	45,940 USD
17	Lab Upgrading and Maintenance	MIT	N/A	MoEYS (RCI fund)	30,000 USD
18	Development of Metamaterial-Based Sensors for Soil Monitoring Application in Agriculture	MIT	N/A	MoEYS (RCI fund)	30,000 USD
19	Smart Building Energy Management System	MIT	N/A	MoEYS (RCI fund)	40,000 USD
20	Ending Plastic Innovation Challenge	MSS	UNDP	UNDP	1,8000 USD
21	Development of Durable and Sustainable Smart Concrete Materials Used for Infrastructure Maintenance and Repair	MSS	N/A	MoEYS (RCI fund)	63,800 USD
22	Inclusion of Phosphorescent Octahedral Clusters in Biopolymers to be Applied as Mycocide by Irradiating the Sample	MSS	U Rennes	BGF-MoEYS	32,076 USD
23	Development of Highly Efficient Moldboard Ploughs Adapting to Different Soil Types	MSS	N/A	MoEYS (RCI fund)	19,000 USD
24	Blended Rubber Foam for Production of Heat Insulation Board	MSS	N/A	MoYES (RCI fund)	43,000 USD
25	Development of Compostable Bags from Cambodian Cassava	MSS	MoE	MoEYS (RCI fund)	48,000 USD
26	Cold Patching Asphalt Mixture (CPAM) for Road Repairs in Hot Climate and Rain-Prone Areas	MSS	N/A	MoEYS (RCI fun)	40,000 USD

27	Development of Locally Produced Activated Carbon from Variety of Agricultural Wastes for Wastewater Treatment	WAE	N/A	MoEYS (RCI fund)	35,000 USD
28	Combined Wastewater Treatment and Nutrient Recovery Technologies for Resource Efficiency in Aquaculture Systems to Advance Circular Economy in Cambodia (TECHNAQUA)	WAE	N/A	MoEYS (HEIP 2)	575,000 USD

Annex 17

Academic Calendar 2024-2025

AOÛT		SEPTEMBRE		OCTOBRE		NOVEMBRE		DECEMBRE		JANVIER		FEVRIER		MARS		AVRIL		MAI		JUIN		JUILLET		AOÛT		SEPTEMBRE		OCTOBRE			
Je 1		Di 1		Ma 1	Fête des morts	Ve 1		Di 1		Ve 1	Nouvel an international	Sa 1		Sa 1		Ma 1		Je 1	Jeunes Internationales de Toulon	Di 1		Ma 1		Ve 1		Lu 1	Semaine de rattrapage	Me 1			
Ve 2		Lu 2	Semaine de rattrapage	Me 2		Sa 2		Lu 2	Orientation pour les admis Inscription du T1	Je 2	13	Di 2		Di 2		Ve 2	Pré-CEVU	Ve 2		Lu 2		Ma 2	18	Sa 2		Ma 2		Je 2			
Sa 3		Ma 3		Je 3		Di 3		Ma 3		Ve 3	13	Lu 3	Séjour d'examens de fin semestre	Lu 3		Je 3	7	Sa 3		Me 3		Je 3	18	Di 3		Me 3	Concours en I3	Ve 3			
Di 4		Me 4		Ve 4		Lu 4	Inscription du T1	Ve 4	CEVU	Sa 4		Ma 4	8	Ma 4		Ve 4		Di 4		Me 4	14	Ve 4	16	Lu 4		Je 4		Sa 4			
Lu 5		Je 5	Concours en I3	Sa 5		Ma 5		Je 5	9	Di 5		Me 5	18	Me 5	3	Sa 5		Lu 5	Fin semestre 1 pour les I1 et T1	Lu 5		Je 5	14	Sa 5		Ve 5		Di 5			
Ma 6		Ve 6		Di 6		Me 6	5	Ve 6		Lu 6		Je 6	18	Je 6	3	Di 6		Ma 6		Ve 6		Di 6		Ma 6		Sa 6		Lu 6	Rentré scolaire		
Me 7		Sa 7	Fin d'année de I1 et T1	Lu 7	Rentré scolaire	Je 7	5	Sa 7		Ve 7	Victoire sur génocide	Ve 7		Ve 7		Lu 7		Me 7		Di 7		Ma 7		Je 7		Di 7		Ma 7			
Je 8		Di 8		Me 8		Ve 8		Di 8		Ma 8	14	Sa 8		Sa 8		Ve 8		Je 8	Journées de rattrapage	Di 8		Me 8		Ve 8		Lu 8		Me 8		Je 8	1
Ve 9		Lu 9	Examen de 3ème semestre pour I1 et T1	Mo 9	1	Di 9	Fête de l'Indépendance Nationale	Lu 9	Inscription du T1 pour les réserves	Mo 9	14	Di 9		Di 9		Ve 9		Mo 9		Lu 9	8	Me 9		Sa 9		Ma 9	Fin semestre 2 pour les I1 et T1	Me 9		Je 9	
Sa 10		Ma 10		Je 10		Di 10		Ve 10		Mo 10		Di 10	Correction et relevé du redus	Mo 10		Je 10		Sa 10		Me 10		Di 10	19	Lu 10		Ma 10	Jury de septembre	Ve 10			
Di 11		Me 11	Jury de septembre	Ve 11		Lu 11		Ma 11		Je 11		Di 11		Me 11		Ve 11		Di 11	Illumination du Bouddha	Me 11	15	Ve 11		Lu 11		Ma 11	Séjour d'examens de fin de 3ème semestre pour les I1 et T1	Je 11		Sa 11	
Lu 12		Je 12		Sa 12		Ma 12	6	Je 12	10	Di 12		Me 12		Me 12	4	Sa 12		Lu 12		Me 12		Di 12		Ma 12		Ve 12		Di 12			
Ma 13		Ve 13		Di 13		Me 13	Journée de prière	Ve 13		Lu 13		Je 13		Je 13	4	Di 13		Ma 13		Ve 13		Di 13		Lu 13		Ma 13		Sa 13		Lu 13	
Me 14		Sa 14		Lu 14		Je 14	Fête des eaux	Sa 14		Ma 14		Ve 14		Ve 14		Lu 14	Nouvel an Khmer	Me 14	Anniversaire du Roi Norodom Sihamoni	Sa 14		Lu 14		Je 14		Ma 14		Di 14		Ma 14	
Je 15		Di 15		Me 15	Commemoration du décès du Roi-père Norodom Sihanouk	Ve 15		Di 15		Lu 15	15	Sa 15		Sa 15		Ma 15		Je 15	SILLON SACRE	Di 15		Ma 15		Ve 15		Lu 15		Me 15	Commemoration de décès du Prince Norodom Ranariddh	Je 15	2
Ve 16		Lu 16		Mo 16	2	Di 16		Lu 16	Semaine scolaire de I1 et T1	Je 16	15	Di 16		Di 16		Ve 16		Lu 16		Mo 16		Sa 16		Ma 16		Je 16		Sa 16		Lu 16	
Sa 17		Ma 17		Je 17		Di 17		Ma 17		Lu 17		Je 17	Relevé de 2ème semestre (stage de fin des études)	Lu 17		Je 17		Sa 17		Me 17		Di 17		Ma 17		Je 17	Jury de passage et jury d'évaluation de diplômés	Ve 17		Lu 17	
Di 18		Me 18	Jury de passage pour I1 et T1	Ve 18		Lu 18		Ma 18		Di 18		Me 18		Me 18		Ve 18		Di 18		Me 18		Lu 18		Ma 18		Je 18		Sa 18		Lu 18	
Lu 19		Je 19		Sa 19		Ma 19		Je 19	11	Di 19		Me 19	Pré-général de l'école	Me 19	5	Sa 19		Lu 19		Me 19		Di 19		Ma 19		Je 19		Sa 19		Lu 19	
Ma 20		Ve 20		Di 20		Me 20	Pré-CEVU	Ve 20		Lu 20		Je 20	Assistance d'examens de l'école	Je 20		Ma 20	Journées de prière de la Francophonie	Di 20		Me 20		Lu 20		Ma 20		Je 20	Jury de passage pour I1 et T1	Sa 20		Lu 20	
Me 21		Sa 21		Lu 21		Je 21	7	Sa 21		Ma 21		Ve 21		Ve 21		Lu 21	Remise de 3ème semestre pour les I1 et T1	Ma 21	12	Sa 21		Di 21		Me 21		Je 21		Di 21	Fête des morts	Sa 21	
Je 22		Di 22		Me 22		Ve 22		Di 22		Lu 22	16	Sa 22		Sa 22		Ma 22		Je 22		Di 22		Ma 22		Ve 22		Lu 22		Me 22		Je 22	3
Ve 23		Lu 23		Mo 23	3	Di 23		Lu 23		Je 23	16	Di 23		Di 23		Ma 23	CEVU	Ve 23		Lu 23		Di 23		Me 23		Je 23		Sa 23		Lu 23	
Sa 24		Ma 24	Journée de la constitution	Je 24	3	Di 24		Ve 24		Lu 24		Je 24		Lu 24		Ma 24	0	Sa 24	Fin de stage	Me 24		Di 24		Ma 24		Je 24		Di 24	Journées de la constitution	Ve 24	
Di 25		Me 25		Ve 25		Lu 25		Ma 25		Di 25		Sa 25	Fin semestre	Ma 25		Je 25		Di 25		Me 25		Lu 25		Ma 25		Je 25		Sa 25		Lu 25	
Lu 26		Je 26		Sa 26		Ma 26		Je 26	12	Di 26		Me 26	Conseil de classe	Me 26		Ma 26	Journées de prière	Sa 26		Lu 26		Je 26		Di 26		Ma 26		Ve 26		Di 26	
Ma 27		Ve 27		Di 27		Me 27	Concours d'entrée	Ve 27		Lu 27		Je 27	2	Je 27	6	Di 27		Ma 27		Ve 27		Lu 27		Ma 27		Je 27		Sa 27		Lu 27	
Me 28		Sa 28		Lu 28		Je 28		Sa 28		Ma 28		Ve 28		Ve 28		Lu 28		Me 28		Di 28		Ma 28		Je 28		Di 28		Ma 28		Lu 28	
Je 29		Di 29		Me 29		Ve 29		Di 29		Lu 29	17	Ve 29		Ve 29		Ma 29		Je 29		Di 29		Ma 29		Ve 29		Lu 29		Me 29		Je 29	
Ve 30		Lu 30		Mo 30		Di 30		Lu 30		Je 30		Di 30		Di 30		Ma 30		Ve 30		Lu 30		Di 30		Ma 30		Je 30		Di 30		Ma 30	
Sa 31		Ma 31		Je 31	4	Di 31		Ma 31		Ve 31		Di 31		Lu 31	16	Di 31		Ma 31		Ve 31		Lu 31		Ma 31		Je 31		Di 31		Ma 31	