



INSTITUTE OF TECHNOLOGY OF CAMBODIA

CONSORTIUM MEETING INTERNATIONAL SUPPORT

PERSPECTIVE & STRATEGY 2026-2027



25 – 26 March 2026

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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 Pentagonal Strategy (Phase I) of the government together with the National Strategic Development Plan. 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
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		0	0	0	0	0	0	0	2	2	2	4	4

Indicators	-	Basis	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Technology Transfer													
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 PROGRESS OF PERSPECTIVES 2025-2026

In the academic year 2025-2026, ITC proposed 5 main activities in total for curriculum updating for engineering programs. Those programs include Electronic and Automating Engineering, Electrical Energy Engineering, Transport and Infrastructure Engineering, Data Science, and Financial Engineering Program. As results, all the five proposed program modification are approved and completed. All necessary documents were technically prepared. Summary of the progress activities is illustrated in Table 2.

Table 2: Overall progress of the proposed activities in perspective 2025 – 2026

No.	Main activities proposed in 2025-2026	Faculty/ Department	Status
Revision/Establishment of Engineering Programs			
1	Modification of curriculum of Electronic and Automating Engineering program	GEE	Completed
2	Modification of curriculum of Electrical Energy Engineering program	GEE	Completed
3	Modification of curriculum of Transport and Infrastructure Engineering program	GCI	Completed

No.	Main activities proposed in 2025-2026	Faculty/ Department	Status
4	Modification of curriculum of Data Science program	AMS	Completed
5	Modification of curriculum of Financial Engineering program	AMS	Completed

4 PERSPECTIVES AND ACTION PLAN FOR 2026 – 2027

4.1 Propose curriculum modification and establishment of new engineering program

There are 6 main activities for perspective in academic year 2026 – 2027. All proposed activities include curriculum modification of associate program of Water Supply and Plumbing, curriculum modification engineering programs of Water Resources Engineering and Rural Infrastructure and Water and Environmental Engineering, establish new engineering program on Autonomous System and Aerospace Engineering, and proposing to re-structure of engineering program from 5-year to 4-year program. 9 institutional development projects have been implementing at ITC. The summary of the proposed activities is shown in Table 3.

Table 3: Proposed main activities/outputs of ITC's perspective 2026-2027

No.	Main activities proposed in 2024-2025	Faculty/ Department	Estimated completion date
I	Revision/Establishment of Associate Programs		
1	Modification of curriculum of Water Supply and Plumbing (WSP) (see Annex 1)	GRU	Aug 2026
II	Revision/Establishment of Engineering Programs		
2	Modification of curriculum of Water Resources Engineering and Rural Infrastructure (WRI) program (see Annex 2)	GRU	Aug 2026
3	Modification of curriculum of Water and Environmental Engineering (WEE) program (see Annex 3)	GRU	Aug 2026
4	Establishment of new engineering program on "Autonomous System and Aerospace Engineering" (see Annex 4)	GIM	Sept 2026
III	Revision/Establishment of Graduate Programs		
5	Modification of curriculum of master program of Materials and Structural Engineering (MSE) (see Annex 5)	GS	Sept 2026

No.	Main activities proposed in 2024-2025	Faculty/ Department	Estimated completion date
IV	Revision of Engineering Program Structure		
6	Propose re-structure of engineering program from 5-year to 4-year program	ITC	Sept 2026
V	Institutional Development Project Implementation		
7	“SATREPS: Establishment of Risk Management Platform for Air Pollution in Cambodia” - JICA	ITC	Jul 2022 - 2027
8	“Project for Enhancing Industry-Academic Networks for Engineering Research and Development in Cambodia (INACON)” - JICA	ITC	Oct 2024 - 2029
9	“Institutional Support to Institute of Technology of Cambodia” – ARES-CCD	ITC	Sept 2022 - 2027
10	“2 nd Higher Education Improvement Project” – 2 nd HEIP – World Bank	ITC	Jan 2025 – 2030
11	“Establishment of Center of Research and Technology Transfer (CRTT)” – MEF	ITC	2024 – 2026
12	“Research and Training Platform on Power System” – EU/AFD	ITC	2023 - 2027
13	“Skills for Future Economy (SFE)” - ADB	ITC	2023 - 2029
14	“Science and Technology Project in Upper Secondary Education (STEP UP)” - ADB	ITC	2023 - 2029
15	“Secondary Education for Human Capital Competitiveness Project (SE4HC)” - ADB	ITC	Jan 2025 – 2030

4.2 Propose re-structure of engineering program from 5-year to 4-year

➤ COUNTRY CONTEXT

- Government Reform Policies

The **Pentagonal Strategy – Phase I** is the top government policy, launched in 2023, serves as the guiding framework for Cambodia’s socio-economic development from 2023 to 2028, The strategy aims to accelerate Cambodia’s progress toward becoming a high-income country by 2050 while strengthening the foundation for achieving the national Vision 2030. It focuses on sustainable economic growth, human capital development, modernization, and resilience.

Ministry of Education, Youth and Sport (MoEYS) is currently undergoing a strategic transformation of its education policies to strengthen human capital and accelerate industrial development, in line with its ambitions to become a high-income country by 2050. The MoEYS’s

Education Strategic Plan (ESP 2024–2028) emphasizes reforms across secondary and higher education to strengthen competencies in STEM, technical skills, and applied learning, ensuring graduates are prepared to meet labor market needs. In higher education, universities are encouraged to streamline degree programs, such as transitioning engineering from five to four years, integrating industry internships, project-based learning, and digital skills, and establishing flexible bachelor–master pathways. These measures aim to reduce time-to-graduation, enabling students to enter the workforce faster and contribute directly to Cambodia’s industrial, technological, and service sectors. This also reflects the objectives of Cambodia’s Industrial Development Policy which required high skill graduates with more efficiencies and in closer alignment with industry needs.

To respond to urgent needs of engineering graduates to support the above-mentioned policies, the Institute of Technology of Cambodia (ITC) is considering to transform its engineering program from a 5-year structure to a 4-year structure as part of a broader modernization of engineering education that aligns with international academic standards and national workforce demands with improving quality of secondary education in Cambodia. In many countries across Asia, Europe, and North America, engineering bachelor’s degrees are typically completed within four years, allowing graduates to enter the labor market earlier and remain competitive with peers from regional and global universities. Adopting a 4-year program would enable ITC to modernize its curriculum by emphasizing more efficient learning pathways, stronger practical competencies, and industry-relevant skills while reducing the financial and time burden on students and their families. Furthermore, aligning the program duration with international norms would enhance the global comparability and recognition of Cambodian engineering degrees, facilitate academic mobility and student exchange programs, and strengthen opportunities for graduates to pursue postgraduate studies abroad. Such alignment is also consistent with international accreditation frameworks such as the Washington Accord and Bologna Accord, which promotes globally comparable engineering education standards and outcome-based learning approaches, thereby helping Cambodian engineering graduates become more competitive in the international labor market while supporting the country’s broader goals of human capital development and industrial growth.

- **Pre-university readiness: major reforms at secondary education**

Priority reforms in Cambodia’s secondary education aim to improve education quality, student learning outcomes, and workforce readiness while supporting the country’s long-term economic transformation and human capital development goals. These reforms are led by the Ministry of Education, Youth and Sport with support from development partners such as the World Bank (WB), Asian Development Bank (ADB), and Japan International Cooperation Agency (JICA).

Several major education development projects have significantly strengthened STEM education in Cambodian secondary schools and improved students’ readiness to transition to higher education institutions, particularly the Institute of Technology of Cambodia. The development projects such as the Secondary Education Improvement Project (SEIP) 2017–2022 by WB, General Education Improvement Project (GEIP) 2022–2026 by WB, Upper Secondary Education Sector Development Program 2015–2021 by ADB, Second Upper Secondary Education Sector Development Program 2018–2025 by ADB, Science and Technology Project in Upper Secondary Education (STEP UP) 2022–2029 by ADB, Secondary Education for Human Capital Competitiveness Project (SE4HC) 2025–2030 by ADB, the Project for Improving Science and Mathematics Education at Upper Secondary Level (ISMEC) 2005 – 2008 by JICA, Project for Establishing Foundations for Teacher Education Colleges (2017–2023) by

JICA, and the ICT and Digital Education Support for Teacher Training by JICA have supported the modernization of science and mathematics curricula, strengthening of teacher capacity in STEM subjects and digital, upgrading of laboratory facilities for both STEM and digital, and the strengthening STEM activity practices at secondary education level. These initiatives promote competency-based learning, critical thinking, and problem-solving skills while introducing digital learning tools and innovation activities that encourage students to pursue science and engineering pathways. By improving students' foundational knowledge in mathematics, physics, chemistry, and technology, these projects help ensure that graduates from upper secondary schools are better prepared to enter rigorous engineering and technical programs at universities. As a result, the strengthened STEM foundation at secondary education creates a more effective pipeline of qualified students who are ready to succeed in engineering education. The transformation for accelerating human capital development for the country's needs is illustrated in Figure 1.

➤ **STATISTIC OF STUDENT PERFORMANCE ENROLLED IN FIRST YEAR AT ITC**

The strong performance of incoming students at the Institute of Technology of Cambodia (ITC) provides a solid foundation to support the transformation of the engineering program from a 5-year to a 4-year structure. With approximately 99% of high school applicants from the science track successfully

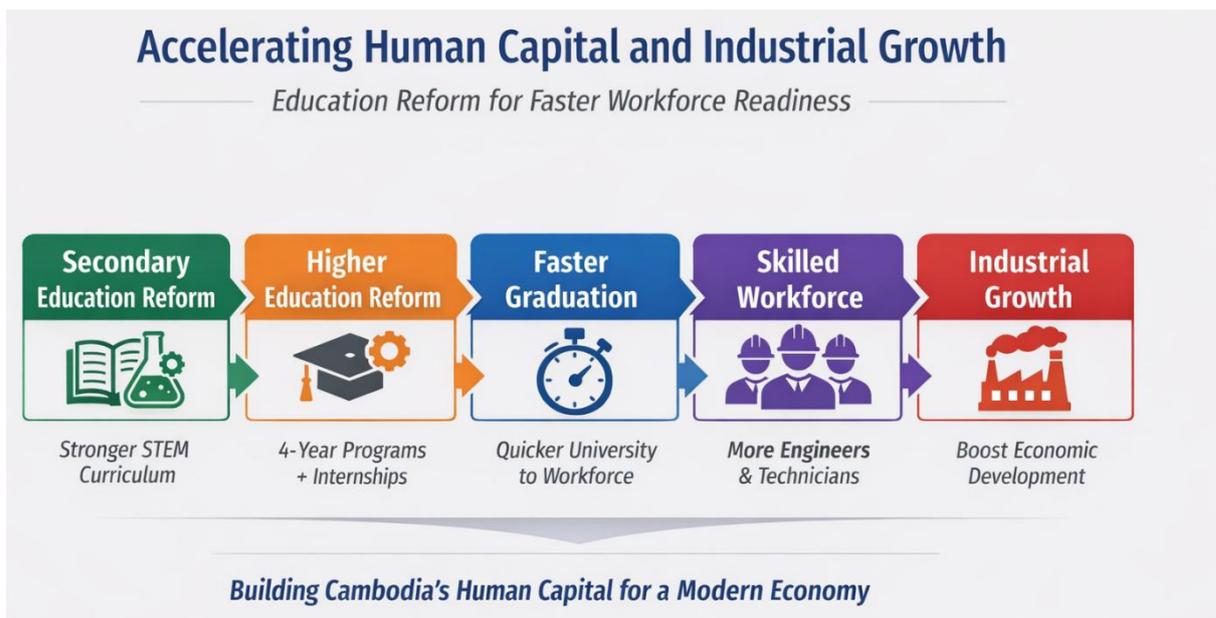


Figure 1: Accelerating Human Capital Development and Industrial Growth through Education Reform

passed the ITC entrance exam, demonstrating the effectiveness of Cambodia's secondary education in building foundational STEM knowledge. Among these successful candidates, about 84% achieved top grades of A, B, or C, reflecting a high level of competence and readiness particularly in mathematics, physics, and other STEM subjects. Only less than 5% of students received a Grade E, indicating that the

vast majority of entrants are academically well-prepared to meet the challenges of university-level STEM education. These results underscore the quality of the student pipeline, ensuring that ITC can recruit capable and motivated students to all majors.

Table 4: Statistic of student enrollment at ITC in Social Science and Science Streams

Academic Year	Student from Social Science Stream	Student from Science Stream
2022 – 2023	0.9%	99.1%
2023 – 2024	0.4%	99.6%
2024 – 2025	0.7%	99.3%

Table 5: ITC's Entrance Exam Results by Bac II Student Grade in 2024-2025

Academic Year	Student grade from Bac II	Number of students passed entrance exam	% of students passed entrance exam
2024 – 2025	A	228	16.19%
	B	553	39.28%
	C	401	28.48%
	D	163	11.58%
	E	63	4.47%
TOTAL		1,408	100%

➤ MODALITY OF IMPLEMENTING THE RE-STRUCTURE OF ENGINEERING PROGRAM

• Challenges on the current 5-year engineering structure

The current 5-year engineering program at ITC presents several structural challenges that may affect both student progression and attractiveness. One major concern is the relatively high dropout rate, with approximately 35% of students not completing the program from initial enrollment to graduation, suggesting that the extended duration of whole academic program may create barriers to successful completion. In addition, the five-year program duration differs from the prevailing 4-year degree model adopted by most higher education institutions in Cambodia, the region, and globally, may not so attractive to new generation students (Gen Z) who often prefer more flexible, efficient, and career-oriented educational pathways. Another challenge lies in the two-year foundation program, during which students do not yet engage in courses directly related to their chosen engineering majors, potentially delaying specialization and losing engagement interest with their field of study. Furthermore, language courses (French and English) account for approximately 26% of the total coursework across the entire program, representing a substantial proportion of the curriculum; however, despite this significant allocation of study time, the resulting language proficiency level achieved by many students remains around A2, indicating that the current balance between language instruction and technical coursework may need reconsideration to improve both language outcomes and technical competencies.

- **Benefits of adopting 4-year engineering program**

The transformation of engineering programs at ITC from **5-year to 4-year structure** can bring several significant advantages while still maintaining the high quality of its graduates as follow:

- i) Aligns with Cambodia, ASEAN, and International Standards
- ii) Reduce drop-out rate
- iii) Faster entry to the workforce
- iv) Earlier exposure to specialised subjects
- v) Align with the country and society's needs
- vi) Reduces financial burden for students and time to employment
- vii) Increase ITC competitiveness and attractiveness
- viii) Improve student motivation and student's interest
- ix) Better alignment with international mobility
- x) Continuing to Master's degree: 2 years (4+2)

- **Modality of implementing the transforming 4-year engineering structure**

The modality for implementing the transformation from 5-year to 4-year engineering program at ITC will be achieved by reducing the foundation program from two years to one year while keeping the three-year specialized engineering courses unchanged. The revised one-year foundation program would focus on strengthening core subjects such as mathematics, physics, and chemistry while maintaining the basic courses required by the Accreditation Committee of Cambodia (ACC), allowing students to enter their majors earlier. At the same time, the three-year duration of specialized engineering courses would be maintained, ensuring that students continue to receive high quality education in their chosen engineering disciplines.

Overall, this modality allows the institution to shorten the total program duration to four years without reducing the quality of professional training, while improving curriculum efficiency, strengthening alignment with international engineering education standards, and enabling graduates to join the workforce earlier to support Cambodia's growing demand for skilled engineers.

The comparison the modality between 5-year and 4-year program can ben seen in Table 6.

- **Foreign languages**

In the restructured four-year engineering program, both French and English languages remain compulsory to ensure students develop essential multilingual competencies for professional and international engagement. The French language is compulsory for all students in year 1 (I1) with 96 hours in order to obtain level A1. ITC will provide opportunity to any students to obtain the French language proficiency up to level B2. Students may then voluntarily register for their preferred proficiency level such as A2 with 128 hours, B1 (192 hours), and B2 (192 hours). Similar to English language, it is compulsory for all students in year 2 (I2) with 128 hours and then voluntarily register for their preferred proficiency level such as B1 with 160 hours and B2 (192 hours).

Table 6: Comparison the modality between 5-year and 4-year program

Modality of 5-year program	Modality of 4-year program
<ul style="list-style-type: none"> ■ Year 1 + Year 2 (1536 h): <ul style="list-style-type: none"> - French language: 352 h - English language: 160 h - Math: 320 h - Physics : 320 h - Chemistry: 64 h - Informatique: 48 h - Dessin Technique: 48 h - Courses required by ACC: 176 h 	<ul style="list-style-type: none"> ■ Year 1 (800 h): <ul style="list-style-type: none"> - French language: 96 h (compulsory) - Math: 192 h - Physics : 192 h - Chemistry: 48 h - Informatique: 48 h - Dessin Technique: 48 h - Courses required by ACC: 176 h
<ul style="list-style-type: none"> ■ Year 3 (768 h): <ul style="list-style-type: none"> - French language: 96 h - English language: 96 h - Specialized courses: 576 h 	<ul style="list-style-type: none"> ■ Year 2 (704 h): <ul style="list-style-type: none"> - English language: 128 h (compulsory) - Specialized courses: 576 h
<ul style="list-style-type: none"> ■ Year 4 (768 h): <ul style="list-style-type: none"> - French language: 64 h - English language: 64 h - Specialized courses: 640 h 	<ul style="list-style-type: none"> ■ Year 3 (640 h): <ul style="list-style-type: none"> - Specialized courses: 640 h
<ul style="list-style-type: none"> ■ Year 5 (384 h): <ul style="list-style-type: none"> - Specialized courses: 384 h - Internship 	<ul style="list-style-type: none"> ■ Year 4 (384 h): <ul style="list-style-type: none"> - Specialized courses: 384 h - Internship

The processes of voluntary registration of French language proficiency are as the following:

- **Compulsory French Language Study (Year 1):**
All engineering students who passed the entrance examination and enrolled in Year 1 at ITC are required to study French language for 96 hours as a compulsory subject of the curriculum, with the objective of achieving at least Level A1 proficiency.
- **Progressive Language Level Enrollment:**
Students may continue advancing their French proficiency based on their certified level. Students who obtain A1 are eligible to register for A2, those with A2 are able to enroll in B1, and those with B1 are eligible to continue to B2. These three-level courses are open to all students from Year 2 to Year 4, allowing continuous improvement of language skills throughout the engineering program.
- **Online Registration:**
An online registration platform will be developed to allow students to register for French language courses according to their desired level. The registration is opened within August.

➤ **Placement Test for Level Confirmation:**

After registration, students will take a placement test corresponding to their selected level, typically conducted one week before the start of the academic year. Based on the test results, only the top 10% students will be able to admit to the preferred courses.

➤ **Attendance Requirement:**

Strict attendance policies will be applied. Students who are absent for more than 20% of the class duration in the first trimester will not be allowed to continue to the second trimester. In addition, students with more than 20% of total absence will not be eligible to take the final test and therefore will not receive the language certificate.

➤ **Eligibility for Post-Graduate Study Opportunities in France:**

Only students who achieve French language proficiency at Level B2 will be eligible to apply for scholarships facilitated through ITC to study Master Degree in France.

The illustration of French language training and progression for ITC engineering students can be described as in Figure 2.

4.3 Summary of main achievement and action plan for 2025-2026 from various institutional development projects

4.3.1 Establishment of Risk Management Platform for Air Pollution

The Air Quality Monitoring System plays crucial role in assessing and managing air pollution in Cambodia. Under support of the Project for Establishment of Risk Management Platform for Air Pollution, funded by SATREPS (Science and Technology Research Partnership for Sustainable Development), the Air Quality Research Laboratory was established at ITC to perform its tasks on data collection, monitoring, and real-time responding and forecasting on air quality in Phnom Penh.

Main achievement by 2025:

- Online air quality monitoring system has been established at six locations in Phnom Penh (ITC, UHS, RUA, Prek Pnov, Areksat, and MoE).
- Air quality monitoring data from 12 existing stations provided by the Ministry of Environment (MoE) have been received and utilized for analysis.
- Standard Operating Procedures (SOPs) for air sampling and chemical analysis have been developed.
- Chemical analysis of particulate matter and PAHs analysis have been conducted, and the results are used for health risk assessment.
- Human resource development has been conducted through laboratory operation, joint research activities, and training.
- Two joint workshops with the Ministry of Environment (MoE) were organized to share research progress and monitoring results.
- Scientific papers have been submitted based on project results.

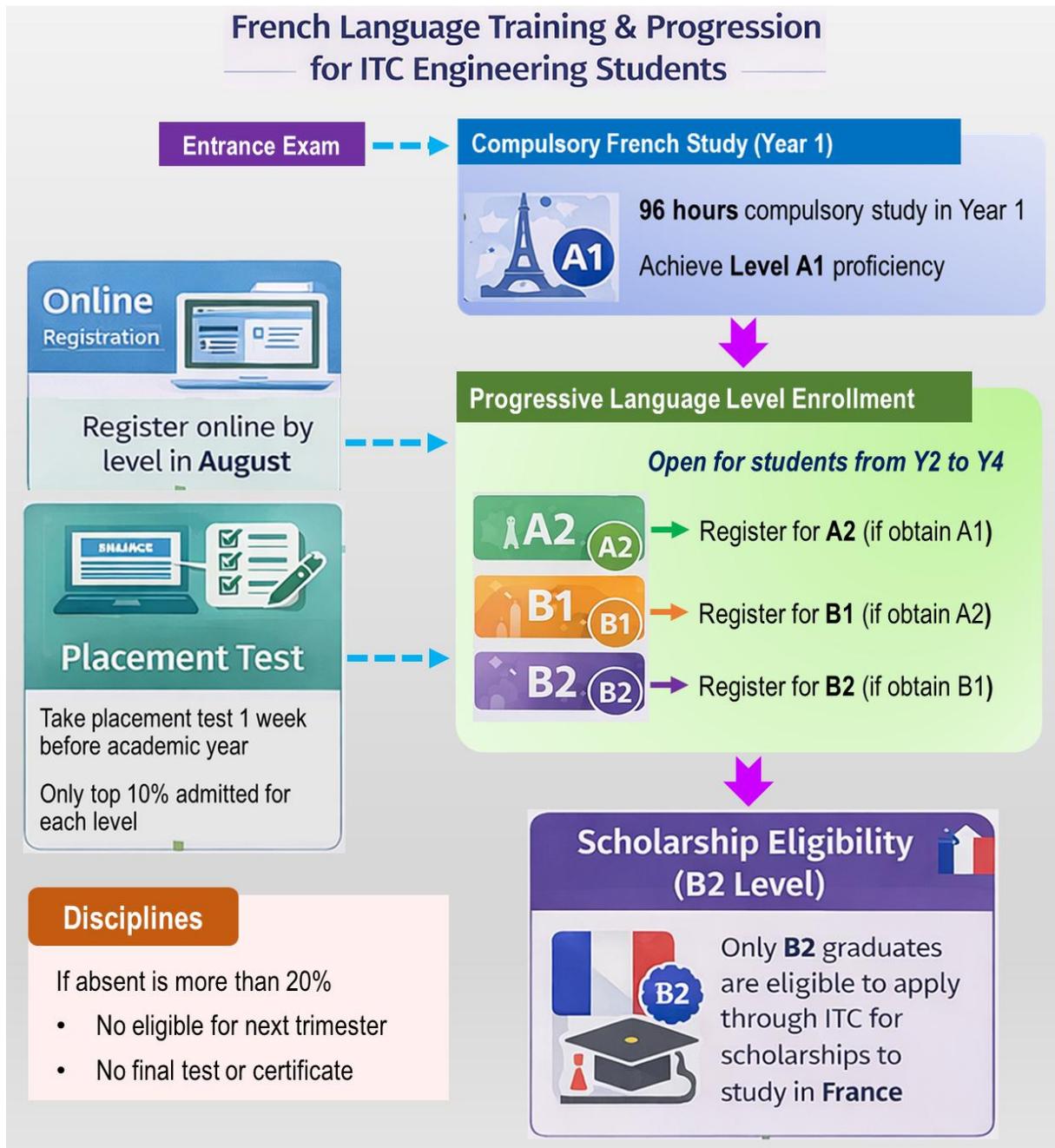


Figure 2: French language training and progression for ITC engineering students

The perspectives for AirSATREPS project for 2026 – 2027 are as follow:

■ **Support Research:**

- Conduct monitoring and chemical analysis of particulate matter (PM2.5, PM0.1, etc.) using the monitoring network and analytical facilities established at the Institute of Technology of Cambodia (ITC).
- Analyze chemical components of particulate matter, including ions, carbon components, and PAHs, to clarify seasonal variations and high-concentration events.

- Identify major emission sources such as biomass burning and plastic burning through chemical analysis and source apportionment studies.
- Conduct combustion experiments and high-time-resolution observations to support emission source characterization and capacity building for emission inventory development.
- Assess potential environmental risk factors and inhalation carcinogenic risk using monitoring data from fixed monitoring sites and living environments.
- Continue capacity development of Cambodian researchers through joint research and training programs on air sampling, chemical analysis, and data interpretation.
- Provide training opportunities in Cambodia and Japan to strengthen the ability of local researchers to independently conduct air pollution monitoring and analysis.
- Prepare and share technical materials, including Standard Operating Procedures (SOPs) and research references, to support sustainable operation of the air pollution research platform.
- **Support Internationalization activities:**
 - Continue international joint research between Cambodian and Japanese institutions under the SATREPS framework.
 - Promote joint publications, conference presentations, and international workshops to disseminate research outcomes and strengthen scientific collaboration.
- **Support Community Outreach:**
 - Conduct outreach activities to improve public awareness and environmental literacy related to air pollution.
 - Disseminate educational materials and videos developed through the project to students and the general public through public events and campaigns

4.3.2 Enhancing Industry-Academic-Community Network (INACON)

Project for Enhancing Industry-Academic-Community Networks for Strengthening Capacity of Engineering Research and Development (INACON) is a 5 years project supported by JICA. The project is a continued project from LBE and has been implemented at ITC from October 2024 to September 2029. This project aims to i) strengthen industry-academic community collaboration in engineering education, ii) support capacity and capability of local universities (NUBB and SRU) on engineering education and research, and iii) establish academic network in Cambodia.

The perspectives for INNACON project for 2026 – 2027 are as follow:

- **Support Academic Program:**
 - Human Resource development in Science and Engineering in Cambodia: 3 to 4 Scholarships for Master's and/or Doctor's degree at ITC for lecturers of SRU and NUBB.
 - Dispatch 5 Japanese professors to discuss on further improvement of ITC and collaborations with ITC.
 - Any necessary trainings/workshops/seminars to enhance the quality of education of ITC, SRU, NUBB and RUPP.
 -

- **Support Research:**
 - Continuous support for current LBE research teams; 6 teams of ITC, 1 team of SRU and 2 teams of NUBB.
 - New calls for LBE Research Grant 2026-2027 for ITC, SRU and NUBB; Approximately 100,000 USD.
 - Support 15th Scientific Day of ITC.
 - Support the Life Mechatronics Symposium 2026 at ITC in December.
 - Support establishment of Cambodian Society for Environmental Science and Engineering (CSESE) (Tentative)
 - Conduct the kick-off General Assembly and 1st Conference on CSESE.
 - Any necessary trainings/workshops/seminars to enhance the research capability of ITC, SRU, NUBB and RUPP.

- **Support University-Industry Linkage (UIL):**
 - Promote for collaborations to Japan Business Association in Cambodia (JBAC) and other related Japanese companies.
 - Invite Japanese companies to events organized by ITC and for sponsored lectures and workshops.
 - Support any events to enhance collaborations with industries such as Industry Consortium, Venture Spark, Career Fair, and others.
 - Any necessary trainings/workshops/seminars to strengthen university industry networks for ITC, SRU, NUBB and RUPP.

- **Support Internationalization activities:**
 - Conduct JICA Knowledge Co-Creation Program (Country-Focused Training) in Japan in August. The themes are internationalization, start-up and academic society. Around 6 members from ITC, SRU and NUBB will join and
 - Cooperate with other JICA Projects in ASEAN countries to exchange human resources and knowledge sharing.
 - Support and coordinate to apply JICA scholarship programs such as STI SEED-Net Program and STI (general) Program.

- **Support Community Outreach:**
 - Support establishment of the first Geopark in Cambodia.
 - Any necessary trainings/workshops/seminars for community outreach.

4.3.3 Establishment of Center of Research and Technology Transfer (CRTT)

The Center for Research and Technology Transfer (CRTT) at the Institute of Technology of Cambodia (ITC) aims to strengthen Cambodia's industrial development, promote innovation, and cultivate a new generation of highly skilled graduates. The current research units (5 research units) will be upgraded with advance equipment to work on innovation link to start-up and technology transfer. CRTT is one of the Public Investment Program (PIP) funded by the Royal Government of Cambodia with the total budget of USD 25 million. This is multi-faceted initiative focusing on both hard infrastructure (lab buildings and equipment) and soft infrastructure (research capacity, industry collaboration, and start-up incubation).

Project Objectives and Scope:

1. Enhance Research and Technology Transfer: Establish modern labs for prototyping, testing, and product development, enabling faculty, students, and industry partners to advance new technologies.
2. Promote Entrepreneurship and Start-Ups: Develop a robust innovation ecosystem through business incubation, mentorship programs, and strong industry linkages, helping researchers and students transform their ideas into market-ready solutions.
3. Improve Skills for Innovation: Provide training programs aligned with industry needs, emphasizing areas such as food processing, robotics, AI, IoT, mechatronics, and big data.

The 8th-floor CRTT building (total area about 18,000 m²) began construction in December 2024 and is expected to be completed in May 2026. It accommodates research laboratories, classrooms, offices, workspaces for master's and PhD students, incubation spaces, and an auditorium.

Activity Plan for 2026-2027:

- Prepare and process the procurement plan for advance equipment
- Install equipment to upgrade the 5 research units

4.3.4 Infrastructure development at ITC campuses

- Under the project of Higher Education Improvement Project (HEIP), an establishment of ITC new campus at Win-Win Monument with total land area of 5 hectares was initiated. 2 buildings are planned to construct in the campus in which one building (student dormitory) was already completed with 74 rooms to accommodate up to 292 students and another building (Research and Training Center) is under construction and expected be completed by Dec 2026. This two building investment costs about USD 11.68 million. This new campus is planned to inaugurate on Oct of 2026.



Figure 3: Student Dormitory at ITC Win-Win Monument campus



Figure 4: Research and Training Center under construction at ITC Win-Win Monument campus

- Under the Public Investment Program (PIP) funded by the Royal Government of Cambodia, the Center for Research and Technology Transfer (CRTT) was approved to construct at ITC Win-Win Monument campus from December 2024 and to be operated in 2026. The total investment is about USD 25.00 million for hard component (building and lab equipment) and soft component (research capacity, industry collaboration, and start-up incubation), whereas the investment for the building is about USD 14.00 million.



Figure 5: Architecture of Center for Research and Technology Transfer



Figure 6: Center for Research and Technology Transfer under construction

- Under the investment of 2nd Higher Education Improvement Project (HEIP 2), 3 more buildings were approved to construction in which 2 building will be constructed at ITC main campus (construction of complex building and construction of library) and one more building (construction of industrial 4.0) to be constructed at ITC Win-Win Monument campus. The 11th floor complex building was designed to improve access and teaching & learning by increasing classrooms, administrative offices, and laboratories, whereas the 6th floor library is to increase access and improving self-learning and soft skills of students. The buildings are now under detail engineering design and the design was conducted by ITC team. The construction is expected to start from Q3 2026. Total investment for the three buildings costs about USD 19.80 million.



Figure 7: 11th floor complex building at ITC main campus (1)



Figure 8: 11th floor complex building at ITC main campus (2)



Figure 9: 8th floor industrial 4.0 building (1)



Figure 10: 8th floor industrial 4.0 building (2)

4.3.5 Enhancing capacity and infrastructure development of library at ITC

The new 6th floor library (supported by 2nd HEIP) was completed its design and the building will be constructed at ITC main campus from Q3 2026. The new library will serve as both physical and digital hub and also open access to public. The library will compose of admin office, open access area, private access area, book repairing room, computer rooms, symposium rooms, seminar rooms, multi-media room, and multi-purpose hall. The capacity of the library could accommodate up to 1,000 students and other staffs and public guests about 200 people.



Figure 11: 6th floor ITC new library building (1)



Figure 12: 6th floor ITC new library building (2)

4.3.6 Establishment of Cambodian Science and Technology Center (CSTC)

Under the project of Science and Technology Project in Upper Secondary Education (STEP UP), the Cambodian Science and Technology Center (CSTC) is initiated to establish and construction at ITC Win-Win Monument campus. The center is designed to build strong foundation of STEM Education at secondary level which link to ITC's mission and inspire public to engage with science and technology. The center will compose of exhibition and show, physical STEM displays, digital STEM contents, education center for enhancing Continuous Professional Development (CPD) program to higher school STEM teacher, and fabrication workshop to develop STEM experimental instrument/tools at secondary education. The investment of hard infrastructure (building) costs about USD 11.0 million.

The vision of Cambodia Science and Technology Center is to inspire everyone to find joy in learning and become a lifelong learner, knowledgeable of their opportunities and abilities to make positive contributions for their own lives and for the communities around them. The mission of Cambodia Science and Technology Center is to provide opportunities for the public to experience, explore, discover and create, inspired by the advances in science and technology globally, connected with opportunities in Cambodia.

The CSTC building is just completed conceptual design and the detail design is expected to start from June 2026. The construction of the center is planned to start in Q2 2027.



Figure 13: Cambodia Science and Technology Center building (Conceptual Design) (1)



Figure 14: Cambodia Science and Technology Center building (Conceptual Design) (2)

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

The number of students, PhD staff, lab for baseline 2025-2026 and projected 2026-2027 is given in Table 7.

Table 7: Number of students, teaching staffs, and labs for baseline 2025-26 and projected 2026-2027

Faculty	Department/ Option	Baseline Academic Year 2025-2026								
		No. Technician Student	No. Eng. Student	No. Master Student	No. PhD Student	No. Master Staffs*	No. PhD Staffs*	No. Support Staffs	No. Lab (Teaching)	No. Lab (Research)
	Tronc Commun		2653			15	1	2	3	
Faculty of Civil Eng.	GCI	223	611			16	22	7	5	
	Arch		242			10	3			
	Transport		164			8	4			
Faculty of Electrical Eng.	GEE	311	422			21	8	5	8	4
	GTR	39	140			6	6	3	4	3
	GIM	186	296			27	11	5	12	4
	GIC	148	245			21	2	12	9	2
	AMS		241			22	7	2	2	
Faculty of Chemical and Food Eng.	Food	438	365			24	23	11	6	3
	Chemical		159							0
Faculty of Hydrology and Water Resources Eng.	WRI	30	153			23	22	12	11	2
	WEE		79							2
Faculty of Geo-resources and Geotechnical Eng.	GGG		200			7	14	3	6	2
Graduate School	GS			185	62					
TOTAL		1375	5970	185	62	200	123	62	66	22

Faculty	Department/ Option	Baseline Academic Year 2026-2027								
		No. Technician Student	No. Eng. Student	No. Master Student	No. PhD Student	No. Master Staffs*	No. PhD Staffs*	No. Support Staffs	No. Lab (Teaching)	No. Lab (Research)
	Tronc Commun		2827			15	1	2	3	
Faculty of Civil Eng.	GCI	230	660			16	22	7	6	
	Arch		262			10	4			
	Transport		142			8	4			
Faculty of Electrical Eng.	GEE	315	439			21	8	4	8	4
	GTR	50	168			8	6	4	5	3
	GIM	190	302			27	11	7	16	4
	GIC	150	250			23	2	11	12	2
	AMS		232			24	8	2	2	
Faculty of Chemical and Food Eng.	Food	420	315			24	23	13	8	3
	Chemical		250							0
Faculty of Hydrology and Water Resources Eng.	WRI	40	105			23	22	12	11	2
	WEE		131							2
Faculty of Geo-resources and Geotechnical Eng.	GPE		76			7	14	3	6	2
	GTE		92							
Graduate School	GS			190	65					
TOTAL		1395	6251	190	65	206	125	65	77	22

* Teaching staffs here is counted only from departments not include Language Section.

4.5 Internal Quality Assurance

The Internal Quality Assurance Office (IQA Office) plays a strategic role in ensuring that academic programs meet the national and global standards of quality and excellence. Its purpose goes beyond compliance—it drives continuous improvement and international competitiveness.

IQA Office at ITC was re-structured and established in 2026 compliance with the Government Regulation Prakas No. 726. The main roles of IQA Office are to i) promote continuous quality Improvement, ii) develop quality assurance systems and Policies, iii) enhance teaching and learning excellence, iv) strengthen internal and international collaboration, and v) ensure academic meets national and international standards. The Perspectives of IQA Office 2026 – 2027 are as the following:

Table 8: Perspectives of IQA Office 2026 – 2027

No.	Target outputs for IQA Office	Perspective Activities 2026-2027
1	Strengthen the internal quality assurance system	<ul style="list-style-type: none"> - Coordinate with relevant departments to organize seminars/workshops related to QA and Teaching& Learning (e.g., Outcome-Based Education, Accreditation Standards, Assessment Methods) 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 staffs. - Ensure a cohesive curriculum pathway: from associate's degree, engineering degree, master's degree to Ph.D. degree.

No.	Target outputs for IQA Office	Perspective Activities 2026-2027
2	Modernization of Curriculum towards OBE and enhancing innovative pedagogy	<ul style="list-style-type: none"> - All 15 engineering programs are expected to complete the curriculum modernization in the context of FutureFit Educational Framework for Outcome-Based Education by the end of 2026. - The curriculum modernization towards FEF-OBE is also under preparation for the International Programs and Master Programs at ITC. - Innovation pedagogy will be applied for all programs at ITC (e.g. project-based learning, lab-based education, competency-based learning, active learning, collaborative learning, flipped classroom, etc.)
3	Produce Self-Assessment Reports (SARs) Obtain regional/international accreditation	<ul style="list-style-type: none"> - At least 10 engineering programs will be produced their SARs (national level) by Oct 2026. - First SAR for AUN-QA will be produced for Electronic and Automation program by Aug 2026 and will be sent for review.
4	Capacity Building	<ul style="list-style-type: none"> - Capacity building on preparing the academic curriculum for FEF-OBE will be provided to all relevant programs include engineering programs, master programs and international programs. - Capacity building on writing SAR will be provided - Capacity building of writing SAR for AUN-QA will be provided to relevant programs - Participate training towards International Accreditation (e.g. AUN/QA) - Regular seminar to be conducted by IQA Office on indicators of IQA National Standard and International Accreditation. - Enhance the capacity of internal assessors to conduct rigorous quality reviews at both the program and institutional levels

4.6 Promote Research and Innovation

The Research and Innovation Center (RIC) at ITC serves as a strategic hub for advancing scientific research, technological innovation, and industry collaboration. RIC was established in 2015, plays a pivotal role in promoting research excellence and innovation within the university and links the research outputs to industries and relevant governmental institutions with purposes of driving technology transfer, commercialization, and start-up development. RIC focuses on five specialized research units:

- i. Energy Technology and Management (ETM)
- ii. Food Technology and Nutrition (FTN)
- iii. Mechatronics and Information Technology (MIT)
- iv. Materials Science and Structure (MSS)
- v. Water and Environment (WAE)

The Perspectives of Research and Innovation Center 2026 – 2027 are as the following:

Table 9: Perspectives of RIC 2026 – 2027

No.	Target outputs for RIC	Perspective Activities 2026-2027
1	Implementation research projects and product developments	<ul style="list-style-type: none"> - Implementing research: 91 (Researcher 120); new projects awarded 28 - Prepare 30 research proposals for grant applications from all research units - Conduct 11 joint research projects with collaborating partners - Join and organize research dissemination workshops, training, and seminar - Develop research prototypes
2	Promote research publication and dissemination	<ul style="list-style-type: none"> - Publish proceeding of 14th and 15th Scientific Day and 4th EraGET into Techno-SRJ platform - Publish special issues of good papers from scientific events into Techno-SRJ platform - Increase number of external active reviewers and editorial members for Techno-SRJ - Organize the 15th Scientific Day at ITC on 4-5 June 2026 - Organize other scientific events - Strengthen triple-helix collaboration and research partnerships (University, Industry, Government)
3	Toward international open access journal	<p>In previous years, the journal aimed to apply for the ASEAN Citation Index (ACI), a regional database established to index bibliographic records and citations. However, since January 2025, the database has been closed to all new indexing applications, submissions, and related activities. As a result, the journal has shifted its strategy toward broader international indexing platforms. In this context, a major milestone of the journal's quality assurance initiative in 2026 will be the formal application to the Directory of Open Access Journals (DOAJ). This step aims to align the journal with international open-access standards and improve its visibility and accessibility to researchers worldwide.</p> <ul style="list-style-type: none"> - Prepare application of Techno-SRJ toward DOAJ - Improve Techno-SRJ platform outreach
4	Capacity Building	<ul style="list-style-type: none"> - Project proposal writing training - Introduction to start up and entrepreneurship training - Training on IP (patent search, patent filing, licensing) - Training on project management - Financial management and procurement <p>Lab Management:</p> <ul style="list-style-type: none"> - 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) - Organize laboratory orientation and exams at least two times per semester. - Extend laboratory utilization through research collaboration and external service

4.7 Promote Graduate School 2026-2027

➤ 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.

Perspective of Graduate School in 2026– 2027:

Table 10: Perspectives of GS 2026 – 2027

No.	Target outputs for GS	Perspective Activities 2026-2027
1	Academic Quality Improving of Master and Doctoral Programs	<ul style="list-style-type: none"> - Continue operating 9 Master Programs and 5 Doctoral Programs - Modernization of master program curriculums to Outcome-Based Education (OBE) - Prepare to revise doctoral curriculum to three focuses: Teaching, Research and Entrepreneurship [(1) Some course options should be included such as Andragogy and Pedagogy, (2) Research ethics and Integrity needs emphasis, (3) Entrepreneurship focus for doctoral research will align with ITC's missions (Technology Transfer and Start-Ups)] - Develop the E-learning courses for the master programs M-AIE, M-ECS, and M-DAS. [(1) Align with the policy of CCUN and (2) Broaden the availability of study program pathways through E-learning courses] - To work closely and effectively with RIC to ensure the progress of research activities and outputs of post-graduate students achieved and students could graduate on time.
2	Capacity Building	<ul style="list-style-type: none"> - Support training to master program managers on modernization of curriculum to OBE - Support training on writing SAR - 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
3	Partnership and Internationalization	<ul style="list-style-type: none"> - Enhance collaborations with existing partners: 21 academic institutions, 4 development agencies and 4 Government/Private sectors/NGO. - Increase number of partners via the double degree doctoral program agreement

No.	Target outputs for GS	Perspective Activities 2026-2027
		<ul style="list-style-type: none"> - Increase number inbound and outbound exchanges of master students. - Increase number of staff mobility to abroad - Increase number of guest lecture from international partners.
4	Internal Quality Assurance and Tracer Study Report	<ul style="list-style-type: none"> - Conduct students' satisfaction for courses in Master programs - Prepare draft Self-Assessment Reports for master programs - Continue preparing required documents for AUN-QA for 3 programs (M-WEE, M-ETM, M-DAS) - Conduct annual employment survey for fresh graduate and produce Tracer Study Report - Conduct employment survey for alumni who graduated master's degree in 2019 (5 years after graduation) to monitor the achieve of Program Learning Outcome
5	Project Implementation for GS	<ul style="list-style-type: none"> - Implement the EDC-AFD-EU project to support Master and Doctoral program in Energy and Technology Management 2023-2027 - Implement the Erasmus+ project "Smart City for ASEAN Learning Network (SCALe)" for micro-course development and integration into relevant master programs. - Implement AUF project to support Master of Materials and Structural Engineering. - Implement EU Global Gateway Scholarship on Water Professions Program, under the framework of Bakheng Water Supply Project Phase 3. Objective: to recruit 30 scholarship students (Bachelor, Master, PhD) to fully study at EU universities.
6	Proposed new activities in perspective 2026-2027	<ul style="list-style-type: none"> i) Propose to add new option "Materials Science and Engineering" and add a new course "Advanced Dynamic Analysis" in M-MSE program. For details, see Annex: M-MSE. See Annex 5. ii) Propose to add new master pathway in 4 programs: (1) M-AIE, (2) M-ECS, (3) M-MIC and (4) M-ETM, to produce Technical Education Trainers in master degree to support the Technical Education High School, majoring in (1) Computer Science, (2) Electronics, (3) Electricity, (4) Food Processing and (5) Mechanics. This proposal is recommended by MoEYS by collaborating with NIE and other technical colleges in Cambodia. This new pathway will support the strengthening of education quality of Technical High School at Upper Secondary by upgrading/producing human resources with master degree. See Annex 6.

4.8 Promote University-Industry Linkage (UIL)

Since the academic year 2022–2023, the University–Industry Linkage (UIL) Office has been undergoing reform to strengthen its mission, with a stronger focus on result-oriented outputs that contribute to improving the quality of academic programs, research, and services across the Institute of Technology of Cambodia (ITC), including UIL governance.

Table 11: Goal and Mission of UIL

Goal	
UIL contributes to enhancing the quality and relevance of academic programs, research, and services, in alignment with Cambodia Vision 2030 and 2050.	
Mission (Outcomes)	Main Activities
1. Support academic programs at all levels to enhance graduate quality for better employment and income	<p>1.1 Develop clear coordination mechanisms and guidelines between the UIL Office and program coordinators to ensure smooth operations</p> <p>1.2 Support the Career Center to introduce and implement an internship scheme based on project-based learning with industry</p> <p>1.3 Support the Career Center in organizing an annual career fair involving relevant stakeholders (industries, partners, alumni)</p> <p>1.4 Coordinate joint activities between faculties, program leaders, and industries to enhance 21st-century skills for lecturers and students</p>
2. Support research activities toward commercialization through strong industry linkage	<p>2.1 Establish a communication platform (physical and digital) to facilitate information exchange between ITC and industries</p> <p>2.2 Support and organize regular promotional events to foster research collaboration with industry, leading to product development, prototyping, start-ups, and commercialization</p>
3. Support stakeholders to improve the quality of institutional services	<p>3.1 Develop a comprehensive inventory of services (testing, training, equipment rental, consultancy) across ITC</p> <p>3.2 Produce marketing and promotional materials for ITC services</p> <p>3.3 Provide capacity-building training for faculty and staff on developing professional and technical training programs</p> <p>3.4 Establish improved mechanisms and regulations for consultancy services within ITC</p>

Table 12: UIL Key Results completed in 2025-2026

No	Result Indicators	Responsible	Budget Support	Remark
1	Standard Operation Manual of ITC Services & Internal Financial Rule Guideline – Drafted and expected launch in 2026.	- Dr. Bun Long - UIL main office - All faculties/departments - RIC	ITC Budget (from services)	Draft completed, pending stakeholder review.
2	Data Management System for UIL – Platform development for ITC services (quotation, invoice, and receipt generating systems). Updating UIL Website – To enhance the visual appeal of the UIL website	- UIL main office - All faculties/departments - RIC	ARES-CCD Project (R1)	Completed development but need a slight modification, expected to launch in May 2026.

No	Result Indicators	Responsible	Budget Support	Remark
3	Industry Visits for Collaboration – Discuss industry needs, promote ITC services, and explore partnerships.	- UIL main office - All faculties/departments - RIC	ITC Budget and other sources	14 industries visited and 37 industries visited ITC (June 2025 - March 2026)
4	Annual ITC-Industries Consortium Meeting – Gather industry feedback for ITC improvement. The event gathered over 30 companies and academic leaders to discuss strategies for enhancing Cambodia's industrial and technological sectors.	- All relevant personnel	ITC and S4C Project	Industry partners emphasized the importance of strengthening soft skills, critical thinking, and problem-solving abilities among engineering graduates. The outcomes of the consortium will guide future curriculum development, training programs, and university–industry collaboration initiatives coordinated by UIL (For more detail: Report of the 8th Industry Consortium.pdf).
5	Intellectual Property (IP) Policy for ITC – Develop and formalize ITC's IP framework.	- Dr. SANG Davin - Dr. YIN Molika - RIC - All faculties/departments	CAPFISH, LBE, and ERIA projects	Draft completed, pending stakeholder review, expected launch in 2026.
6	Brochures and catalog of all type of services including testing, training, equipment rental, and consultancy from 9 faculties/departments – Developed and promoted in our platform (UIL Website, Telegram Channel and Facebook Page)	- UIL main office - All faculties/departments	ITC Budget (from services)	Developed and promoted, keep updating. <i>*Available in soft-copy and hard-copy</i>
7	Dissemination Workshop on “Legal Frameworks for Advancing University–Industry Engagement”	- UIL main office - All faculties/departments - RIC	ARES-CCD Project (R2)	Completed the dissemination workshop in December 2025. <i>(involvement of 70 lecturers, teachers, and research students)</i>
8	Services & Industry Engagement: <ul style="list-style-type: none"> Number of MoUs/MoAs signed with industry partners Number of companies engaging in joint projects, consultancy, training with ITC 	- UIL main office - All faculties/departments - RIC	N/A	MoUs & MoAs: 11 (June 2025 - March 2026) Services: 12 (June 2025 - March 2026)

No	Result Indicators	Responsible	Budget Support	Remark
	<ul style="list-style-type: none"> Revenue generated from lab testing, training, consultancy, and renting services. 			Revenue: Detail in Annual Financial Report (UIL Office)

Perspectives of UIL for 2026-2027

Table 13: Proposed main activities/outputs of UIL's perspective 2026-2027

No.	Result indicators for UIL	Timeframe	Responsible	Strategy
1	Update marketing and promotional materials for ITC services (e.g., posters, videos, training catalogs) and develop departmental education profiles (students, expertise, labs, research, services).	Jan 2027	- UIL Main Office - Supporting staff / freelancers	Engage stakeholders and departments; collaborate with marketing professionals to ensure high-quality, consistent, and up-to-date branding across materials.
2	Conduct visits to at least 10 industries to identify needs, promote ITC services, and explore collaborations (internships, job opportunities, joint projects, etc.).	Mar – Dec 2026	- UIL Main Office - All Faculties/Departments - RIC	Identify priority sectors, contact companies, schedule visits, and systematically document industry needs to inform training, research, and service development.
3	Develop a classification framework of industries to better target partnerships, training programs, and research collaborations.	Mar – Dec 2026	- UIL Main Office - All Faculties/Departments - RIC	Identify key sectors (manufacturing, construction, ICT, agri-food, energy); map industry needs; align with ITC expertise; establish and maintain an industry database.
4	Establish an Industrial Consortium Board and formalize the structure of the consortium platform, aligning with ITC's core functions (education, research, services) and ensuring industry feedback leads to actionable outcomes.	Mar – Dec 2026	- Dr. Bun Long - UIL Main Office - All Faculties/Departments - RIC	Develop governance structure (ToR, roles, membership criteria); onboard partner companies; define collaboration mechanisms (internships, joint projects, services); ensure follow-up and implementation of agreed actions.
5	Establish an Industry Advisory Board to provide strategic guidance on curriculum development, research direction, and industry-relevant skills.	Mar – Dec 2026	- Dr. Bun Long - UIL Main Office - All	Identify and invite key industry leaders; define advisory roles and responsibilities; formalize

No.	Result indicators for UIL	Timeframe	Responsible	Strategy
			Faculties/Departments - RIC	structure (ToR); organize initial meeting to provide strategic recommendations.
6	Organize the Annual ITC–Industries Consortium Meeting to gather industry feedback and strengthen internship and cooperative education programs.	Jan 2027 (3rd week)	- Dr. Bun Long - UIL Main Office - All Faculties/Departments - RIC	Organize a high-impact event; invite both Advisory Board members and consortium partners; present ITC services; collect structured feedback; showcase collaboration outcomes.

4.9 Promote Library and Cambodian Cyber University Network

➤ Enhancing capacity and infrastructure development of library at ITC

The STEM Library, inaugurated in 2017 to a new building I at the Institute of Technology of Cambodia, is a brand-new facility designed to support academic and research activities in the fields of Science, Technology, Engineering, and Mathematics (STEM). The library is managed by a dedicated team of six librarians and houses an extensive collection of 13,350 books, 2,378 theses, 127 printed journals, may open educational resources and open access database. It offers a variety of spaces to cater to diverse user needs, including 10 discussion rooms, 1 meeting room, 1 self-study room, and 3 startup rooms for innovative projects and collaborative work. Since its establishment, the STEM Library has become a central hub for learning, research, and innovation, providing students, faculty, and researchers with the resources and environment necessary for academic success. To strengthen and enhance the service of library, the new 6th floor building will be constructed at ITC main campus starting from 2026 and completed in 2028.

The perspective the ITC library 2026 – 2028 is shown below.

Table 14: Perspective of ITC Library 2026 – 2028

No.	Target outputs for Library	Activities
1	Infrastructure Development	<ul style="list-style-type: none"> - Construction of new 6th floor library in main campus - Upgrading IT equipment and furniture for the administration staffs to support daily operation - Upgrade library server for institutional repository for hosting the system applications such as Library Management System, E-library, Attendance Management System, Inventory Management System, Room booking system, AI-Powered Recommendation System
2	Resource Development	<ul style="list-style-type: none"> - Acquisition of the books to support teaching and research activities - Subscription to peer review journal database - Collecting open access and open educational resource

No.	Target outputs for Library	Activities
		- Partnership with other libraries for resource sharing
3	Capacity Building	- Provide staffs and partners universities training related to library management, reference service, leadership skill - Provide students, teachers, researchers training related to open access, research publication - Provide staff study visit to other ASEAN and European countries
4	Student Support Service	- Promote library services usages - Provide training about research methodology and how to use scientific database - Consultation on life issue
5	Support Community Outreach and Internationalization Activities	- Provide necessary trainings/workshops/seminars for community outreach. - Provide training related to library information science, research methodology, library system support - Organize international webinar related to library management, reference service, Digital Transformation, AI readiness in the library - Join International conference related to library field

➤ **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.

On June 25th, 2024, CCUN was officially launched under the high presidency of His Excellency Samdech Maha Bovoratheh Hun Manet, Prime Minister of the Kingdom of Cambodia, and His Excellency

Dr. Hang Chuon Naron, Deputy Prime Minister and Minister of the Ministry of Education, Youth and Sport, with 12 member universities. By the end of 2024, CCUN has total 18 member universities joining the network. The new members are listed as follow:

- 1) National University of Cheasim Kamchaymear
- 2) University of Kratie
- 3) Royal School of Administration
- 4) Phnom Penh Teacher Education College
- 5) Battambang Teacher Education College / Regional Teacher Training Center
- 6) National University of Management
- 7) Royal University of Law and Economics
- 8) Angkor University
- 9) Phnom Penh international university
- 10) University of Management and Economics
- 11) Cambodian University for Specialties
- 12) University of South-East Asia

Action Plan 2026 – 2027

- Continue to operate the courses that has been developed
- Transform courses 10-15 in the master program of Data Science and Computer Science into e-learning
- Continue to support member universities and partners to develop their e-learning activities
- Engage more university into the network

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.
- Number of staffs to support all ITC operation.

- 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.

ANNEXES

Annex 1:

Detail of proposed modification of Associate's Degree Program of Water Supply and Plumbing (T-WSP)

1. BACKGROUND

The faculty of hydrology and water resources engineering (GRU) has been operating the associate's Degree program of Engineering in Water Supply and Plumbing from 2023. There were two cohorts of students have been graduated by 2026. GRU has re-evaluated the program and it showed the need to modify to fit the competency based of the graduates. It needs to shift the curriculum from theoretical overview to more practical, industry-specific competency.

2. Proposed Curriculum Modifications of Electronics and Automation

- **Increased Emphasis on Practical Skills:** The most significant shift in the proposal is the increase in practical hours (TP) and the introduction of "Practice" specific courses.
 - Hands-on Focus: The new curriculum introduces "Water Treatment Practices" (64 hours of practical work) and "Pipe Connecting Practices" (32 hours of practical work). This directly supports the program's goal of producing graduates who can effectively operate and maintain water systems.
 - Theoretical courses like "Water Treatment Process and Technology" are being removed to ensuring students spend more time doing in lab.
- **Improve Industry-Need Software**

The modification recognizes the necessity of digital skills needed for technician in water supply and plumbing.

 - Dedicated CAD Training: The current "Basic Surveying and AutoCAD" is being replaced by a dedicated "Technical Drawing and AutoCAD" course (3 credits).
 - Mapping Capabilities: This aligns with the specific learning outcome of having the capability to create maps and manage network plans, which is critical for urban and rural water network planning.
- **Introduction of Specialized Technical Subjects**

To make graduates more versatile and employable, the proposal adds specialized subjects that were previously missing:

 - Fire Fighting Systems: A new subject added to Semester 2, addressing the need for complex building system knowledge beyond basic plumbing.
 - Water Quality Analysis: A new dedicated subject that ensures graduates can perform essential chemical tests, supporting the learning outcome of treating water effectively.
 - Surveying: Now a standalone subject, emphasizing its importance in network layout and installation.

Table 1: Summary of Proposed Curriculum Modifications (2025-2026)

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
T1-S1	1	Informatics	16		32	48	2	16		32	48	2
	2	Hydraulics	16	16	16	48	2	32	16	16	64	3
	3	Hydrology	16	16	32	64	2.5	Remove				
	4	Introduction to Water Supply and Sanitation	32			32	2	Remove				
	5	Electricity	32	24	8	64	3	16	16	16	48	2
	6	Environment	32			32	2	32			32	2
	7	Communication and Ethics	32			32	2	32			32	2
	8	Water Supply and Sanitation	Add new					32			32	2
	9	Technical Drawing and AutoCAD	Add new					32		32	64	3
	10	Surveying	Add new					16		32	48	2
Total of I3-S1			176	56	88	320	15.5	208	32	128	368	18
T1-S2	1	ArcGIS and Mapping	32		32	64	3	32		32	64	3
	2	Basic Surveying and AutoCAD	16		64	80	3	Remove				
	3	Building Sanitation and Plumbing Design	32	32		64	3	32	32		64	3
	4	Water Treatment Process and Technology	32	16	16	64	3	Remove				
	5	Pipe Distribution Design	32	32		64	3	16	32		48	2
	6	Pump and Mechanical Tools for Water Distribution System	32			32	2	32			32	2
	7	Water Quality Analysis	Add new					16	16	16	48	2
	8	Fire Fighting System	Add new					32			32	2
	9	Water Treatment Practices	Add new					16		64	80	3
Total of I3-S2			176	80	112	368	17	176	80	112	368	17
T2-S1	1	Water Treatment Practices	16	32	64	112	4	Move to T2-S2				
	2	Pipe Network Installation and Monitoring		32	64	96	3		32	64	96	3

	3	Plumbing Installation and Control		32	64	96	3		32	64	96	3
	4	Efficient Energy Consumption and Management	32			32	2	32			32	2
	5	Cost Estimating and Contracting	32	16		48	2.5	32	32		64	3
	6	Work Safety and Hygiene	32			32	2	32			32	2
	7	Internship Report				0	2				0	2
	8	Pipe Connecting Practices	Add new					16		32	48	2
	Total of I5-S1		112	112	192	416	18.5	112	96	160	368	17
T2-S2	1	Final Year Internship and Thesis Defense				384	9				384	9
	Total of I5-S2					384	9				384	9
Total of T-WSP			464	248	392	1488	60	496	208	400	1488	61

3. Updated Curriculum for Electronics and Automation Engineering Program

This curriculum is designed for a technician degree (associate's degree of engineering) that illustrates the whole two years program in Water Supply and Plumbing (T-WSP). The curriculum of the T-WSP in the academic year 2026-2027 is shown below:

Table 2: New curriculum of T-WSP

Gr.	No.	Name of Subject	C (hr)	TD (hr)	TP (hr)	Total (hr)	Credit
T1-S1	1	Informatics	16		32	48	2
	2	Hydraulics	32	16	16	64	3
	3	Electricity	16	16	16	48	2
	4	Environment	32			32	2
	5	Communication and Ethics	32			32	2
	6	Water Supply and Sanitation	32			32	2
	7	Technical Drawing and AutoCAD	32		32	64	3
	8	Surveying	16		32	48	2
	Total of I3-S1			208	32	128	368
T1-S2	1	ArcGIS and Mapping	32		32	64	3
	2	Building Sanitation and Plumbing Design	32	32		64	3
	3	Pipe Distribution Design	16	32		48	2

	4	Pump and Mechanical Tools for Water Distribution System	32			32	2	
	5	Water Quality Analysis	16	16	16	48	2	
	6	Fire Fighting System	32			32	2	
	7	Water Treatment Practices	16		64	80	3	
	Total of I3-S2		176	80	112	368	17	
	1	Pipe Network Installation and Monitoring		32	64	96	3	
	2	Plumbing Installation and Control		32	64	96	3	
	3	Efficient Energy Consumption and Management	32			32	2	
	4	Cost Estimating and Contracting	32	32		64	3	
	5	Work Safety and Hygiene	32			32	2	
	6	Internship Report				0	2	
	7	Pipe Connecting Practices	16		32	48	2	
	Total of I5-S1		112	96	160	368	17	
T2-S2	1	Final Year Internship and Thesis Defense				384	9	
	Total of I5-S2					384	9	
Total of T-WSP			496	208	400	1488	61	

Annex 2:

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

1. Background Rationale for Modernization of WRI

The **Water Resources Engineering and Rural Infrastructure (WRI)** program is offered by the Faculty of Hydrology and Water Resources Engineering (GRU) at the Institute of Technology of Cambodia (ITC). It is a comprehensive five-year engineering degree. Currently, it stands as the only dedicated degree in water resources engineering in Cambodia, distinguishing it from other general environmental engineering programs. Due to the need for a job market in this skill, particularly road construction, we decided to update the program in 2024. Now, GRU is modernizing the programs based on the FutureFit Educational Framework - Outcome-Based Education (FEF-OBE). The modernization is aimed at improving the quality of the program to meet the needs of the local job market and promoting the 21st century skills to the new graduates. Particularly, WRI program is planned to apply for recognition of national quality assurance.

The proposal to upgrade the WRI program is driven by specific market findings and national educational strategies.

- **Addressing the Skills Gap (Tracer Study Findings):** A tracer study conducted one year after graduation in 2024, revealed that 80% of the employed graduates are working directly in infrastructure development or related engineering fields. 32% of graduates working as site engineer, site Supervisor, and safety engineer. Notably, 44% of the employed graduates show a specific need for soft-skill improvement.
- **National Framework Alignment:** The revision aligns with the **FutureFit Educational Framework (FEF)** of Cambodia and is part of the Ministry of Education's "Higher Education Improvement Project Phase 2". This project mandates comprehensive documentation and internationalization of the curriculum.
- **Market Evolution:** The initiative aims to improve the quality of graduates to meet the demands of the modern job market, ensuring they are equipped not just with technical skills, but also with "21st-century skills".

2. The FEF-OBE Approach (Outcome-Based Education)

To address these challenges, the GRU is shifting to an Outcome-Based Education (OBE) method. This involves a structured hierarchy of objectives:

- **Program Educational Objectives (PEOs):** Three specific PEOs were defined to align with ITC's mission and national strategic development goals (such as the National Green Growth Strategy and Climate Change Strategic Plan).
- **Program Learning Outcomes (PLOs):** Ten PLOs have been developed to support the PEOs, covering knowledge, cognitive skills, and interpersonal responsibility.
- **The new framework emphasizes:**
 - **Technical Competency:** Strengthening road construction and irrigation engineering and related infrastructure development.
 - **Soft Skills:** Introducing dedicated sessions on "Skills for Employability".
 - **Modern Methodology:** Integrating Problem-Based Learning (PBL), case study, project based, and improved computer proficiency.

3. Proposed Course Structural Modifications of WRI

After carrying out the faculty strategic workshop to review the program and curriculum mapping, we proposed curriculum modification for the academic year 2026-2027 highlights specific strategic changes designed to optimize student learning:

- **Integration of Emerging Topics:** A new course, "**Nature-based Solutions**," (2 credits) has been added to Year 4, Semester 2, reflecting modern trends in sustainable engineering.
- **Enhanced Soft Skills:** The "**Skills for Employability**" course in Year 3 has been upgraded from **0.5 credits to 1.0 credit**, doubling the focus on job readiness.
- **Some Courses Adjustments:**
 - Hydrology and Computer-Aided Design (AutoCAD) have been moved earlier, from Semester 2 to Semester 1 of Year 3, to provide students with essential technical tools sooner.
 - GIS and Remote Sensing have been moved from Year 4 down to Year 3, Semester 2, allowing for earlier adoption of spatial analysis tools.
 - Credit Adjustments: The total credits for the core years (Year 3 to Year 5) have been slightly adjusted from 93 to 94 credits to accommodate these enhancements.

Table 1.1: Summary of proposed WRI 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	Move to I3-S2				
	7	Meteorology	16	16		32	1.5	Move to I3-S2				
	8	Geology and Hydrogeology	16	16		32	1.5	Move to I3-S2				
	9	Skills for Employability		16		16	0.5		32		32	1
	10	Hydrology	Move from I3-S2					32	16	16	64	3
	11	Computer-Aids Designs (AutoCAD)	Move from I3-S2							32	32	1
Total of I3-S1			112	240	32	384	15.5	96	208	80	384	15
I3-S2	1	French		32		32	1		32		32	1
	2	English		64		64	2		64		64	2
	3	Computer-Aids Designs (AutoCAD)			32	32	1	Move to I3-S1				

	4	Hydrology	32	16	16	64	3	Move to I3-S1					
	5	Soil Mechanics and Foundations	32	16	16	64	3	Move to I4-S1					
	6	Surveying	16	16	48	80	3	16		48	64	2.5	
	7	Computer Programing	16		32	48	2	16		32	48	2	
	8	GIS and Remote Sensing	Move from I4-S1					16		64	80	3	
	9	Meteorology	Move from I3-S1					16			16	1	
	10	Strength of Materials	Move from I3-S1					16	32		48	2	
	11	Geology and Hydrogeology	Move from I3-S1					16	16		32	1.5	
	Total of I3-S2			96	144	144	384	15	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		Earth Dam Design & Construction	16	16	16	48	2	Move to I4-S2					
4		GIS and Remote Sensing	16		64	80	3	Move to I3-S2					
5		Structural Analysis	32	32		64	3	32	32		64	3	
6		Construction Materials	16		32	48	2	16		32	48	2	
7		Hydraulics	16	16	16	48	2	16	16	16	48	2	
8		Disaster Risk Assessment	32			32	2	32			32	2	
9		Soil Mechanics and Foundations	Move from I3-S2					32	16	16	64	3	
10		Road Engineering and Construction	Move from I4-S2					32	16	16	64	3	
Total of I4-S1			128	128	128	384	16	160	144	80	384	17	
I4-S2	1	French II		32		32	1		32		32	1	
	2	English II		32		32	1		32		32	1	
	3	Road Engineering and Construction	32	16	16	64	3	Move to I4-S1					
	4	Groundwater Exploration	32			32	2	32			32	2	
	5	Irrigation and Drainage System	32	48		80	3.5	32	32		64	3	
	6	On-Site Safety Management	16			16	1	16			16	1	
	7	Introduction to Integrated Water Resources Management	16			16	1	16			16	1	
	8	Reinforced Concrete Design	32	32		64	3	32	32		64	3	
	9	Climate-Resilient Road Design	16	32		48	2	16	32		48	2	

	10	Earth Dam Design and Construction	Move from I4-S1				16	16	16	48	2	
	11	Nature-based Solutions	Add New				32			32	2	
	Total of I4-S2		176	192	16	384	17.5	192	176	16	384	18
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	Land Management	16	32		48	2	16	32		48	2
	4	Climate Change Impacts and Adaptation	32			32	2	32			32	2
	5	Hydraulic Structures	32	32	32	96	4	32	32	32	96	4
	6	Water Resources Economics	32			32	2	32			32	2
	7	Cost Estimating and Contracting	16			16	1	16			16	1
	8	Project Management	32			32	2	32			32	2
	9	Multi-Disciplinary Design Project	32	32		64	3	32	32		64	3
	10	Internship Report					2					2
	Total of I5-S1		192	160	32	384	20	192	160	32	384	20
I5-S2	1	Final Year Internship and Thesis Defense				384	9				384	9
	Total of I5-S2					384	9				384	9
Total of WRI			704	864	352	2304	93	736	832	352	2304	94

4. New Curriculum Structure of WRI Program

This new 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 2026-2027 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	Skills for Employability		32		32	1
	7	Hydrology	32	16	16	64	3

	8	Computer-Aids Designs (AutoCAD)			32	32	1
	Total of I3-S1		96	208	80	384	15
I3-S2	1	French		32		32	1
	2	English		64		64	2
	3	Surveying	16		48	64	2.5
	4	Computer Programing	16		32	48	2
	5	GIS and Remote Sensing	16		64	80	3
	6	Meteorology	16			16	1
	7	Strength of Materials	16	32		48	2
	8	Geology and Hydrogeology	16	16		32	1.5
	Total of I3-S2		96	144	144	384	15
I4-S1	1	French I		32		32	1
	2	English I		32		32	1
	3	Structural Analysis	32	32		64	3
	4	Construction Materials	16		32	48	2
	5	Hydraulics	16	16	16	48	2
	6	Disaster Risk Assessment	32			32	2
	7	Soil Mechanics and Foundations	32	16	16	64	3
	8	Road Engineering and Construction	32	16	16	64	3
	Total of I4-S1		160	144	80	384	17
I4-S2	1	French II		32		32	1
	2	English II		32		32	1
	3	Groundwater Exploration	32			32	2
	4	Irrigation and Drainage System	32	32		64	3
	5	On-Site Safety Management	16			16	1
	6	Introduction to Integrated Water Resources Management	16			16	1
	7	Reinforced Concrete Design	32	32		64	3
	8	Climate-Resilient Road Design	16	32		48	2
	9	Earth Dam Design and Construction	16	16	16	48	2
	10	Nature-based Solutions	32			32	2
	Total of I4-S2		192	176	16	384	18
I5-S1	1	Module d'Insertion Professionnelle (MIP)		32		32	1
	2	English for Work and Career: Engineering Skills		32		32	1
	3	Land Management	16	32		48	2
	4	Climate Change Impacts and Adaptation	32			32	2
	5	Hydraulic Structures	32	32	32	96	4
	6	Water Resources Economics	32			32	2
	7	Cost Estimating and Contracting	16			16	1
	8	Project Management	32			32	2
	9	Multi-Disciplinary Design Project	32	32		64	3
	10	Internship Report					2
	Total of I5-S1		192	160	32	384	20
I5-S2	1	Final Year Internship and Thesis Defense				384	9
	Total of I5-S2					384	9
Total of WRI			736	832	352	2304	94

Annex 3:

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

1. Background and Narrative for Modernization

Faculty of Hydrology and Water Resources Engineering (GRU) makes a proposal to modernize the WEE program driven by a strategic necessity to bridge the gap between technical proficiency and professional adaptability. The goal is to prepare the program for AUN-QA assessment in 2027 by

shifting from content-based teaching to Outcome-Based Education

2. The FEF-OBE Approach (Outcome-Based Education)

FutureFit Educational Framework (FEF) and Outcome-Based Education (OBE) principles outlined in the faculty's program specification, the new Water and Environmental Engineering (WEE) program structure aligns with the framework by directly addressing the "skills gap" identified in stakeholder feedback and prioritizing holistic student development.

- GRU has organized the consultation workshop for Conducting Need Analysis Survey to Benchmark the Academic Program WEE with Market Needs which was held on the 28th of November 2025, at ITC. The result of the discussion and comments from the stakeholders have been analysis for making the program modification.
- The Driver (Tracer Study Insights): The tracer study of graduate after one year of graduation shows that 62.5% are currently employed in related sectors (e.g., Water Supply, Plumbing, Environmental Authorities, Pumping Technologies). All of graduates work in water and environmental sectors. However, a critical gap was identified: graduates often lacked essential soft skills, specifically in Problem Solving, leadership and entrepreneurship.
- The Framework (FEF-OBE): To address this, GRU is adopting the FutureFit Educational Framework (FEF) with an Outcome-Based Education (OBE) approach. This shifts the focus from simple knowledge delivery to ensuring graduates meet specific educational objectives (PEOs) and learning outcomes (PLOs) aligned with national goals like the Pentagonal Strategy and Cambodia SDGs such as Clean Water and Sanitation.

Accreditation and Quality: The modernization is part of the "Higher Education Improvement Project Phase 2". The explicit aim is to upgrade the program's quality to improved accreditation status, ensuring graduates are equipped with 21st-century skills (critical thinking, digital literacy, and communication) alongside their technical engineering expertise

3. Curriculum Modifications: Fit to New Program Specifications

The proposed curriculum structure directly operationalizes the goals outlined in the program specification. The modifications prioritize employability, early technical adoption, and sustainability. The proposed new WEE program will maintain the total number of credits at 97 credits, from year 3 to year 5.

- **Enhancing Soft Skills & Employability**
 - Program Spec Goal: The specification explicitly calls for "Enhancing soft skills through dedicated 'Skills for Employability' sessions and Entrepreneurship".
 - Curriculum Modification: In Year 3, Semester 1, the credit value for the course "**Skills for Employability**" has been doubled from 0.5 credits to 1.0 credit. This tangible increase demonstrates a commitment to resolving the leadership and entrepreneurial gaps identified in the tracer study.
 - Adding new course of **Entrepreneurship**, aiming at supporting the Program's Educational Objectives – PEO4 which is to produce an entrepreneurial mindset in the Water and Environment or other sectors for creating more or new jobs.
 - Adding new course: Treatment plant operation and maintenance, based on feedback from the consultation workshop with stakeholders. The increase of development of

water treatment and wastewater treatment in the town and provinces require more operators for operating and maintaining the plants.

- **Early Integration of Technical Tools (Digital Skills)**

- The new curriculum aims to "improve computer skills to better prepare students for 21st-century careers" and enhance "Information technology or digital skills" (PLO9).
- Curriculum Modification: AutoCAD: Moved from Year 3, Semester 2 to Year 3, Semester 1. This ensures students master essential design software a semester earlier. GIS and Remote Sensing: Moved significantly earlier, from Year 4, Semester 1 to Year 3, Semester 2. By shifting these digital tools to the third year, students can utilize them in advanced design projects during their fourth year, facilitating innovative pedagogy such as Problem-Based Learning (PBL), service learning or case study integration.

- **Improve Competency-Based Subjects**

- Hydrology is moved to Year 3, Semester 1 (from S2), serving as a foundational prerequisite earlier in the program.
- Credit Optimization: The course "Surveying" was adjusted from 3.0 to 2.5 credits, likely to make room for these new, higher-priority subjects without overloading students.
- Adding new course: BIM Model for Water Supply and Plumbing, will make the student competent on using modern tools for their new work experience

Table 1.1: Summary of proposed modification of WEE:

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	Move to I3-S2				
	7	Meteorology	16	16		32	1.5	Move to I3-S2				
	8	Geology and Hydrogeology	16	16		32	1.5	Move to I3-S2				
	9	Skills for Employability		16		16	0.5		32		32	1
	10	Hydrology	Move from I3-S2					32	16	16	64	3
	11	Computer-Aids Designs (AutoCAD)	Move from I3-S2							32	32	1
Total of I3-S1			112	240	32	384	15.5	96	208	80	384	15
I3-S2	1	French		32		32	1		32		32	1
	2	English		64		64	2		64		64	2
	3	Computer-Aids Designs (AutoCAD)			32	32	1	Move to I3-S1				

	4	Hydrology	32	16	16	64	3	Move to I3-S1				
	5	Soil Mechanics and Foundations	32	16	16	64	3	Move to I4-S1				
	6	Surveying	16	16	48	80	3	16		48	64	2.5
	7	Computer Programing	16		32	48	2	16		32	48	2
	8	GIS and Remote Sensing	Move from I4-S1					16		64	80	3
	9	Meteorology	Move from I3-S1					16			16	1
	10	Strength of Materials	Move from I3-S1					16	32		48	2
	11	Geology and Hydrogeology	Move from I3-S1					16	16		32	1.5
	Total of I3-S2			96	144	144	384	15	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	Chemistry for Environmental Engineering	16	32		48	2	16	32		48	2
	4	Biology for Environmental Engineering	48			48	3	16	32		48	2
	5	Environmental Engineering Laboratory			32	32	1			32	32	1
	6	GIS and Remote Sensing	16		64	80	3	Move to I3-S2				
	7	Environmental Hydraulics	16	16		32	1.5	16	16		32	1.5
	8	Fundamental for Environmental Engineering	32	16		48	2.5	32	16		48	2.5
	9	Environmental Pollution Control	32			32	2	32		16	48	2.5
	10	Water Quality Analysis and Management	Move from I4-S2					32			32	2
	11	Research Methodology	Move from I5-S1					32			32	2
Total of I4-S1			160	128	96	384	17	176	160	48	384	17.5
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	Move to I4-S1				
	4	Water Treatment Processes and Design	32	16		48	2.5	32	16		48	2.5
	5	Water Supply Engineering	32	32		64	3	32	32		64	3
	6	Hydro-Informatics	32			32	2	Move to I4-S1				
	7	Unit Operations and Processes for Environmental Engineering	16	32		48	2	16	32		48	2

	8	Building Sanitation Engineering	48	16	16	80	4	48	16	16	80	4
	9	Introduction to Integrated Water Resources Management	16			16	1	16			16	1
	10	Sustainable and Green Energy Systems	Move from I5-S1					32			32	2
	11	BIM Model for Water Supply and Plumbing	Add new					32			32	2
	Total of I4-S2		208	160	16	384	18.5	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	Design of Wastewater Treatment and Collection System	48	32		80	4	48	32		80	4
	4	Solid Waste Management	32			32	2	32			32	2
	5	Urban Drainage and Sewage System	32	32		64	3	32	32		64	3
	6	Environmental Engineering Project	32			32	2	32			32	2
	7	Environmental Impact Assessment	32			32	2	32			32	2
	8	Sustainable and Green Energy Systems	32			32	2	Move to I4-S2				
	9	Work Safety	16			16	1	16			16	1
	10	Research Methodology	32			32	2	Move to I4-S1				
	11	Internship Report				0	2				0	2
	12	Treatment plant operation and maintenance	Add new					32			32	2
	13	Entrepreneurship	Add new					32			32	2
	Total of I5-S1		256	128	0	384	22	256	128	0	384	22
I5-S2	1	Final Year Internship and Thesis Defense				384	9				384	9
	Total of I5-S2					384	9				384	9
Total of WEE			832	800	288	2304	97	832	800	288	2304	97

4. New Curriculum Structure of WEE Program

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 2026-2027 is shown below:

Table 1.2: 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	Skills for Employability		32		32	1
	7	Hydrology	32	16	16	64	3
	8	Computer-Aids Designs (AutoCAD)			32	32	1
Total of I3-S1			96	208	80	384	15
I3-S2	1	French		32		32	1
	2	English		64		64	2
	3	Surveying	16		48	64	2.5
	4	Computer Programing	16		32	48	2
	5	GIS and Remote Sensing	16		64	80	3
	6	Meteorology	16			16	1
	7	Strength of Materials	16	32		48	2
	8	Geology and Hydrogeology	16	16		32	1.5
Total of I3-S2			96	144	144	384	15
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	16	32		48	2
	5	Environmental Engineering Laboratory			32	32	1
	6	Environmental Hydraulics	16	16		32	1.5
	7	Fundamental for Environmental Engineering	32	16		48	2.5
	8	Environmental Pollution Control	32		16	48	2.5
	9	Water Quality Analysis and Management	32			32	2
	10	Research Methodology	32			32	2
Total of I4-S1			176	160	48	384	17.5
I4-S2	1	French II		32		32	1
	2	English II		32		32	1
	3	Water Treatment Processes and Design	32	16		48	2.5
	4	Water Supply Engineering	32	32		64	3
	5	Unit Operations and Processes for Environmental Engineering	16	32		48	2
	6	Building Sanitation Engineering	48	16	16	80	4
	7	Introduction to Integrated Water Resources Management	16			16	1
	8	Sustainable and Green Energy Systems	32			32	2
	9	BIM Model for Water Supply and Plumbing	32			32	2
Total of I4-S2			208	160	16	384	18.5
I5-S1	1	Module d'Insertion Professionnelle (MIP)		32		32	1
	2	English for Work and Career: Engineering Skills		32		32	1
	3	Design of Wastewater Treatment and Collection System	48	32		80	4
	4	Solid Waste Management	32			32	2
	5	Urban Drainage and Sewage System	32	32		64	3
	6	Environmental Engineering Project	32			32	2
	7	Environmental Impact Assessment	32			32	2
	8	Work Safety	16			16	1
	9	Treatment plant operation and maintenance	32			32	2

Gr.	No.	Name of Subject	C (hr)	TD (hr)	TP (hr)	Total (hr)	Credit
	10	Entrepreneurship	32			32	2
	11	Internship Report				0	2
	Total of I5-S1		256	128	0	384	22
I5-S2	1	Final Year Internship and Thesis Defense				384	9
	Total of I5-S2					384	9
Total of WEE			832	800	288	2304	97

Annex 4:

Detail of proposed establishment of new engineering program on “Autonomous System and Aerospace Engineering”

1. Rational

Opening the Department of Autonomous Systems and Aerospace Engineering at the Institute of Technology of Cambodia (ITC) is a strategic imperative driven by global labor market transformations outlined in the World Economic Forum's Future of Jobs Report 2025. The report highlights the Automotive and Aerospace sector as one undergoing profound changes, with 100% of employers anticipating AI and big data as transformative forces, alongside robotics and automation impacting 58% of businesses. Roles such as Electric and Autonomous Vehicle Specialists rank among the top 15 fastest-growing jobs, fueled by the green transition—where 71% of sector employers expect carbon emissions reductions to reshape operations—and technological advancements like AI information processing (86%). In Cambodia's context, this program addresses the nation's expanding aviation infrastructure, including new airport developments and aircraft acquisitions, while building on the Dynamics and Control Laboratory (DCLab)'s pioneering work in drones, rockets, and satellite technologies. By equipping students with skills in AI, cybersecurity (prioritized by 78% in the sector), and technological literacy (84%), ITC can produce graduates ready for a sector with minimal net job declines (below 14%), contributing to Cambodia's economic goals of industrial upgrading and sustainable development amid geoeconomic shifts.

Furthermore, establishing this department aligns with Cambodia's demographic and economic realities, where an expanding working-age population in lower-middle-income economies like ours demands high-value job creation. The WEF report emphasizes cross-industry collaboration in Aerospace, with high supply chain dependence (46%) vulnerable to trade restrictions, underscoring the need for local expertise in autonomous systems to enhance resilience. DCLab's track record in producing human resources through projects like CubeSat engineering positions ITC uniquely to integrate practical, research-driven education, fostering innovation in areas like drone-based agriculture and disaster monitoring—critical for a flood-prone nation. Over the next 5-10 years, this program will bridge skills gaps (cited as the top barrier by 63% of global employers), promoting upskilling in resilience, systems thinking, and environmental stewardship, ultimately supporting net global job growth of 78 million by 2030 and positioning Cambodia as a regional tech hub.

Program Key Attributes

Proposed Depart Name	:	Autonomous System and Aerospace Engineering
Degree	:	Engineer' Degree
Program Type	:	National Program
Program Duration	:	4 years (1-year Foundations + 3-year Specialization)
Opening Academic Year	:	2027-2028

2. Expected Graduates' Job Roles

- **AI and Machine Learning Specialists:** Third on the WEF's top 15 fastest-growing jobs; graduates can apply ML for autonomous navigation, predictive maintenance in drones, or satellite data analysis.

- **Autonomous and Electric Vehicle Specialists:** Seventh fastest-growing; ideal for EV propulsion and drone/swarm systems, tying into Cambodia's EV policy and regional autonomous tech needs.
- **Software and Applications Developers:** Fourth fastest-growing; focused on embedded systems, control software, and AI apps for aerospace.
- **Environmental Engineers:** Twelfth fastest-growing; leveraging renewable energy and sustainability courses for green aerospace designs, like solar-powered drones.
- **Renewable Energy Engineers:** Fifteenth fastest-growing; applying propulsion and energy storage knowledge to sustainable aviation and space tech.
- **Information Security Analysts:** Thirteenth fastest-growing; with cybersecurity coursework, graduates can secure networked autonomous systems.
- **DevOps Engineers:** Fourteenth fastest-growing; for integrating AI and robotics in deployment pipelines.
- **Internet of Things Specialists:** Tenth fastest-growing; building on IoT and sensors for connected drones and satellites.
- **Data Analysts and Scientists:** Eleventh fastest-growing; using big data skills for aerospace simulations and mission data.
- **Satellite Systems Engineers or Drone Technologists:** Specialized roles emerging locally (e.g., via Cambodia's satellite initiatives) and globally, directly from capstone projects.

3. Draft of program structure

Year	Sem	Course Name	Description	Hours	Credits	Ref University and Program
1	1+2	Foundation Courses	Regular ITC foundation program	800		
2	1	Materials Science	Properties of materials (metals, polymers, composites), selection for aerospace applications, and testing.	48	2	Georgia Tech Aerospace Engineering BS
2	1	Propulsion Systems	Jet engines, rocket propulsion, electric propulsion, and performance analysis.	64	3	Georgia Tech Aerospace Engineering BS; Embry-Riddle Uncrewed Systems
2	1	Robotics Fundamentals	Kinematics, dynamics of robots, sensors, actuators, and basic programming for robotic systems.	64	3	Cranfield University Robotics MSc; Embry-Riddle Uncrewed & Autonomous Systems
2	1	Signals and Systems	Signal processing, Fourier transforms, and system analysis for control and communication.	64	3	Georgia Tech Aerospace Engineering BS
2	1	Introduction to Control Systems	Basics of feedback control, system modeling, and stability analysis.	64	3	University of Colorado Boulder Autonomous Systems focus
2	1	Introduction to AI and Machine Learning	Fundamentals of AI, neural networks, and machine learning algorithms with Python labs.	48	2	University of Colorado Boulder Autonomous Systems; Cranfield University Robotics MSc
2	2	Strength of Materials	Stress, strain, deformation, and failure analysis in structural components.	48	2	Georgia Tech Aerospace Engineering BS
2	2	Aerodynamics	Principles of airflow, lift, drag, airfoil design, and computational fluid dynamics (CFD) basics.	64	3	Georgia Tech Aerospace Engineering BS (core aerodynamics); University of Illinois
2	2	Embedded Systems	Microcontrollers, real-time systems, and programming for hardware integration (e.g., Arduino/Raspberry Pi).	48	2	Cranfield University Robotics; University of Colorado Boulder
2	2	Control Theory for Autonomous Systems	Advanced control techniques, PID controllers, state-space methods, and simulations. Control of aircraft/spacecraft, and simulation tools.	64	3	University of Colorado Boulder Autonomous Systems; Cranfield Robotics

2	2	Computer Vision	Image processing, feature detection, and vision algorithms for autonomous navigation.	64	3	Cranfield University Robotics MSc
2	2	Lab Project I	Group project integrating foundation skills, e.g., simple autonomous robot or drone prototype.	48	2	Embry-Riddle Uncrewed Systems (hands-on projects)
2	2	Strength of Materials	Stress, strain, deformation, and failure analysis in structural components.	48	2	Georgia Tech Aerospace Engineering BS
3	1	Drone Technology	Design, aerodynamics, and control of UAVs, with hands-on building and flying labs.	48	2	Embry-Riddle Aeronautical University Uncrewed Aircraft Systems BS
3	1	Satellite Systems Engineering	Orbital mechanics, satellite design, communication, and CubeSat projects.	64	3	University of Colorado Boulder Aerospace (satellite focus); Embry-Riddle
3	1	Autonomous Navigation and Path Planning	Introduction to autonomy, perception, planning, and decision-making in unmanned systems. Algorithms for SLAM, GPS integration, obstacle avoidance, and multi-agent systems.	64	3	Cranfield University Robotics; University of Colorado Boulder Autonomous Systems focus; Embry-Riddle
3	1	AI for Aerospace	Machine learning applications in predictive maintenance, flight optimization, and anomaly detection.	48	2	Embry-Riddle Uncrewed & Autonomous Systems Engineering MS
3	1	Sensors and Instrumentation	Sensor technologies, data acquisition, and calibration for autonomous and aerospace systems.	48	2	Cranfield University Robotics
3	2	Rocketry and Space Propulsion	Rocket design, trajectories, and propulsion systems with simulations.	64	3	Georgia Tech Aerospace Engineering BS
3	2	Elective: Renewable Energy in Aerospace	Integration of solar energy in drones and satellites for sustainable design.	48	2	University of Colorado Boulder (sustainability in aerospace)
3	2	Elective: IoT for Engineering	Internet of Things basics, sensor networks, and data communication protocols.	48	2	Cranfield University Autonomous Systems
3	2	Cybersecurity for Autonomous Systems	Security protocols, threat modeling, and protection for networked aerospace systems.	48	2	Embry-Riddle Uncrewed Systems (emerging focus)
3	2	Human-Machine Interaction	Interface design, ergonomics, and AI ethics in autonomous vehicles and spacecraft.	48	2	University of Colorado Boulder Autonomous Systems
3	2	Advanced Lab Project II	Intermediate project, e.g., autonomous drone swarm or satellite subsystem development.	64	3	Embry-Riddle Uncrewed Systems
3	2	Applied Engineering Internship after Year 3 Completion	Professional skills, resume building, and industry exposure seminars.	0		ITC standard (internship prep across programs)
4	1	Space Mission Design	End-to-end mission planning, payload design, and risk analysis for satellites/rockets.	48	2	University of Colorado Boulder Aerospace
4	1	Advanced Autonomous Systems	Deep learning, reinforcement learning, and real-world applications in robotics/aerospace.	64	3	Cranfield University Robotics MSc; Embry-Riddle
4	1	Swarm Robotics and Multi-Agent Systems	Coordination of multiple autonomous agents, algorithms for swarming, and applications in aerospace.	64	3	Cranfield University Robotics MSc
4	1	Avionics and Electronics in Aerospace	Electronic systems for flight control, navigation, and communication.	48	2	Georgia Tech Aerospace Engineering BS
4	1	Systems Engineering and Integration	Lifecycle management, requirements engineering, and integration of complex systems.	48	2	Embry-Riddle Uncrewed Systems
4	1	Elective: Environmental Stewardship in Engineering	Climate impact of aerospace tech, green propulsion, and sustainable practices.	48	2	University of Colorado Boulder (green transition focus)
4	1	Research Methods	Scientific research, data analysis, and proposal writing for engineering projects.	48	2	ITC Graduate School Alignment Preparation
4	2	Final Year Project (Internship)		120	9	ITC standard (required internships)

4. Human Resources Nurtured by the Dynamics and Control Laboratory (DCLab)

No.	Name	Degree	Specialization	University	Country	Graduate Year
1	CHHIN Savry	Master	Computational Fluid Dynamics	ITB	Indonesia	2018
2	BO Sengtin	Master	Flight Mechanics	ITB	Indonesia	2018
3	ATH Sopagna	Master	System and Control	TIT (Tokyo Tech)	Japan	2018
4	TAN Hor	Master	Control System	ITS	Indonesia	2019
5	DOUNG Sokmengkeang	Master	Control System	ITS	Indonesia	2019
6	HENG Samneang	Master	Energy Science	UM + Kyoto Univ	Malaysia + Japan	2019
7	SOKHAL Aylik	Master	Robotics (mapping)	IMT Alès	France	2019
8	CHAO Vanyi	Master + PhD	AI (fast object detection)	KAIST	South Korea	2019
9	IM Polimey	Master	Satellite Development	Kyutech	Japan	2019
10	TIM Hoksong	Master	Rocket Propulsion	Kyutech	Japan	2020
11	SREAN Penghuy	Master	Satellite Development	TUB	Germany	2020
12	VIRAK Alexander	Master + PhD	Instrumentation/ System Measurement	Grenoble	France	2020
13	VIRAK Somonika	Master + PhD	Instrumentation/ System Measurement	Grenoble	France	2020
14	SENG Rattana	Master + PhD	Robotics and control	CNU	South Korea	2020
15	MOEURN Dear	Master	AI (Computer Vision)	UY	Japan	2020
16	OUM Sotheara	Master + PhD	Robotics and control	CNU	South Korea	2021
17	SOK Kungsamreth	Master	AI (Reinforcement Learning)	IMT Alès	France	2021
18	SEK Sereiboth	Master	Robotics	INSA Toulous	France	2021
19	BUN Sopheapanha	Master	AI for Robotics	UY	Japan	2022
20	VAN Sela	Master	Robotics	KU	Thailand	2027
21	HIM Vanthorng	Master	UAV Flight control	Univ of Ulsan	South Korea	2023
22	HORT Sovanvichea	Master	Aircraft Flight control	Samara National Research Univ	Russia	2024
23	SRONG Ougy	Master	Robotics	Tsinghua University	China	2024
24	LY Pechvathana	Master	Satellite Development	Kyutech	Japan	2028
25	CHHIN Savry	Master	Computational Fluid Dynamics	ITB	Indonesia	2028
26	BO Sengtin	Master	Flight Mechanics	ITB	Indonesia	2028
27	ATH Sopagna	Master	System and Control	TIT (Tokyo Tech)	Japan	2025
28	TAN Hor	Master	Control System	ITS	Indonesia	2029
29	DOUNG Sokmengkeang	Master	Control System	ITS	Indonesia	2026
30	HENG Samneang	Master	Energy Science	UM + Kyoto Univ	Malaysia + Japan	2026
31	SOKHAL Aylik	Master	Robotics (mapping)	IMT Alès	France	2026
32	CHAO Vanyi	Master + PhD	AI (fast object detection)	KAIST	South Korea	2026
33	IM Polimey	Master	Satellite Development	Kyutech	Japan	2026
34	TIM Hoksong	Master	Rocket Propulsion	Kyutech	Japan	2026
35	SREAN Penghuy	Master	Satellite Development	TUB	Germany	2028
36	VIRAK Alexander	Master + PhD	Instrumentation/ System Measurement	Grenoble	France	2028

Annex 5:

Detail of proposed modification of Master of Materials and Structural Engineering (M-MSE)

1. Background

Program of master of materials and structural engineering has been implemented since 2010. The student has the possibility to apply for double degree with INSA Rennes through this program. To strengthen the engineering curriculum in response to Cambodia's growing interest of public to seismic hazards, the program will introduce a specialized course titled Advanced Dynamics Analysis. This course will equip students with deeper analytical and computational skills necessary for understanding complex dynamic behavior in structures and materials. Key components include:

- Structural dynamics under seismic loading, including response spectra, time-history analysis, and nonlinear dynamic behavior.
- Finite Element-based dynamic modeling, enabling students to simulate real-world structural responses.
- Case studies of regional seismic events, with a focus on emerging seismic data from Cambodia and neighboring countries.

To diversify academic pathways and address the increasing demand for advanced materials knowledge in modern construction and manufacturing, the program will introduce a new pathway "Materials Science and Engineering". This pathway will:

- Provide students with a strong foundation in material processing and behavior, including metals, polymers, ceramics, composites, and emerging smart materials.
- Emphasize material performance under dynamic and seismic loads, supporting safer and more resilient structural design.
- Integrate sustainability and local-material innovation, encouraging research into Cambodia's abundant natural resources and potential for green construction materials.
- Prepare graduates for careers in materials development, quality control, manufacturing, and research & innovation.

This new pathway aligns with Cambodia's growing industrial sectors and the national push for resilient, sustainable infrastructure. In conjunction with fourth phase of rectangular strategy and industrial development policy 2015-2025 of Cambodian government, human resources in Materials Science and Engineering are being one of important factors. Materials science and engineering with modern production and engineering are the priorities science and technology domains stated in the Science, Technology and Innovation Roadmap 2030 (The STI Roadmap 2030).

In addition to the existing master program, in the future, we would like to implement in two pathways:

- 1) Materials and Structural Engineering Pathway
- 2) Materials Science and Engineering Pathway

2. Proposed Course Structural Modifications of Materials and Structural Engineering Pathway

2.1 Materials and Structural Engineering Pathway

Currently, students follow the Materials and Structural Engineering Pathway, will have to take as compulsory,

- Three common courses:
 - UE1 Stability and non-linear mechanics 2 Credits
 - UE2 – Law of non-linear mechanic behavior of materials 2 Credits
 - UE3 – Numerical methods 3 Credits
- Three specialized courses:
 - UESP1 – Mechanics and advanced hydraulics of soils and rocks 2 Credits
 - UESP2 – Durability and Resilience of materials 2 Credits
 - UESP3 – Composite steel structure 2 Credits

In addition to these courses, students will have to choose at least one elective course to earn minimum 2 more Credits:

- Scientific communication 2 Credits

New elective course is proposed: Advance Dynamic Analysis, 2 Credits. In the new proposed pathway, students will have to choose at least one elective course:

- Scientific communication 2 Credits
- Advance Dynamic Analysis, 2 Credits

Table 1: Summary of proposed MSE modification:

Course Category	Current situation		New proposal	
	N. Credit	Hrs.	N. Credit	Hrs.
1. Common course				
UE1 – Stability and non-linear mechanics	2	48	2	48
UE2 – Law of non-linear mechanic behavior of materials	2	48	2	48
UE3 – Numerical methods	3	48	3	48
2. Specialized course				
UESP1 – Mechanics and advanced hydraulics of soils and rocks	2	48	2	48
UESP2 – Durability and Resilience of materials	2	48	2	48
UESP3 – Composite steel structure	2	48	2	48
	Min. 13		Min. 13	
3. Elective course				
Scientific communication	2	36	2	36
Advance Dynamic Analysis	-	-	2	48
Join conference	-	-	-	-
4. Thesis	12	576	12	576
	Min. 27	Min. 27		

2.2 Materials Science and Engineering Pathway

In this proposed pathway, students will have to join common courses provided in Materials and Structural Engineering Pathway:

- Three common courses:
 - UE1 Stability and non-linear mechanics 2 Credits
 - UE2 – Law of non-linear mechanic behavior of materials 2 Credits
 - UE3 – Numerical methods 3 Credits
- Three specialized courses will be provided for students in this pathway:
 - UESP1 – Mechanics and advanced hydraulics of soils and rocks 2 Credits
 - UESP8 – Materials Processing 2 Credits
 - UESP9 – Micro-scale properties characterization 2 Credits

Table 2: Summary of proposed option “Materials Sciences and Engineering”

Course Category	Current situation	
	N. Credit	Hrs.
1. Common course		
UE1 – Stability and non-linear mechanics	2	48
UE2 – Law of non-linear mechanic behavior of materials	2	48
UE3 – Numerical methods	3	48
2. Specialized course		
UESP2 – Durability and Resilience of materials	2	48
UESP8 – Materials Processing	2	48
UESP9 – Micro-scale properties characterization	2	48
	Min. 13	
3. Elective course		
Scientific communication	2	36
Join conference	-	-
4. Thesis	12	576
	Min. 27	Min. 27

Annex 6:

Detail proposal of Master's Degree in Technical Education in Teaching Computer Science (M.Ted in Teaching Computer Science)

1. Introduction and Strategic Rationale

This proposal formally outlines the introduction of a new Technical Education Pathway for the Master's Degree in Teaching Computer Science at the Institute of Technology of Cambodia (ITC). This proposed curriculum will serve as a vital third academic track, complementing the institution's existing Course-Research and Research-Based pathways. While the current pathways are expertly designed to produce industry-ready specialists and academic researchers respectively, this third pathway is explicitly engineered to cultivate pedagogical leadership in the field of Information and Communication Technology (ICT).

1.1. Degree Awarded

Upon successful completion of the program, candidates will be awarded the following degree:

- **In Khmer:** បរិញ្ញាបត្រជាន់ខ្ពស់អប់រំបច្ចេកទេសផ្នែកការបង្រៀនវិទ្យាសាស្ត្រកុំព្យូទ័រ
- **In English:** Master's Degree in Technical Education in Teaching Computer Science (M.Ted in Teaching Computer Science)

1.2. Strategic Rationale

The strategic rationale for this pathway is deeply rooted in Cambodia's national development agenda. As the nation enters a new phase characterized by rapid global technological advancement, the Royal Government of Cambodia has introduced the Pentagonal Strategy Phase I, which unequivocally identifies human resource development as its utmost priority. In direct alignment with this strategy, the Ministry of Education, Youth and Sport (MoEYS) is aggressively reforming the education sector to enhance science and technology instruction and strengthen technical and vocational education and training (TVET) at the upper secondary level. Despite the steady increase in technical program enrollments, a critical gap remains in the availability of highly qualified teaching personnel who possess both deep technical expertise and advanced pedagogical competencies. The introduction of this Technical Education Pathway addresses this systemic challenge by providing a rigorous, standardized framework to produce master-level educators capable of bridging the gap between higher technical education and secondary labor market demands.

1.3. Vision of the Program

The vision of the program is to produce graduates who possess technical competence, professional ethics, moral integrity, and a strong teaching mindset. To achieve this, the program is designed to:

- Prepare educators to work effectively as technical education teachers in computer science at the upper secondary level, in strict accordance with teacher qualification standards, career pathways, and Cambodia's Pentagonal Strategy Phase I.
- Provide learners with the flexibility to select various subjects related to Computer Science, relevant technical fields, and pedagogical education, with a strong emphasis on practical, hands-on learning.

- Enable graduates to guide learners in practical tasks, demonstrate effective leadership, and collaborate efficiently within academic and professional teams.
- Promote collaboration and partnership in education among training institutions, educational establishments, organizations, and public and private enterprises to continually enhance the relevance and quality of technical education.
- Encourage the participation of communities, local authorities, and relevant departments in developing teaching processes that respond to national development strategies, ensuring graduates can compete effectively in ASEAN and global contexts.

2. Program Educational Objectives (PEOs) and Learning Outcomes (PLOs)

The overarching vision of the Technical Education Pathway is to produce graduates who embody technical excellence, professional ethics, moral integrity, and a profound pedagogical mindset. These graduates will be prepared to work effectively as technical education teachers in computer science at the upper secondary level, in strict accordance with national teacher qualification standards and career pathways.

2.1. Program Educational Objectives (PEOs)

This program aims to achieve the following six objectives:

- **PEO 1:** To enable learners to gain comprehensive knowledge and technical skills in Computer Science, along with professional pedagogical competencies that meet teacher qualification standards allowing them to conduct independent research and pursue further studies at higher levels.
- **PEO 2:** To develop in learners a spirit of inquiry and lifelong learning, along with the abilities to analyze, synthesize, think critically and creatively, manage, work collaboratively, plan, make decisions, and solve problems. The program also fosters the ability to seek and apply new technologies for professional development, and to apply their knowledge effectively in teaching technical learners or in other Computer Science-related professions.
- **PEO 3:** To enable learners to integrate knowledge and skills from various disciplines and apply them in their teaching profession, keeping pace with social and technological advancements.
- **PEO 4:** To develop teachers with good character, moral integrity, professional ethics, discipline, honesty, patience, and physical and mental well-being, enabling them to perform their teaching duties with dedication and professionalism.
- **PEO 5:** To foster patriotism, optimism, and pride in the Nation, Religion, and King, encouraging learners to become responsible citizens who uphold democratic values, and reject corruption, violence, and drug abuse both in professional and daily life.
- **PEO 6:** To cultivate a sense of responsibility toward family, institutions, community, and the nation, inspiring learners to dedicate themselves to the common good and to contribute actively to national economic development recognizing that skilled human resources in technical fields are a vital factor in the production of goods and the provision of services.

2.2. Program Learning Outcomes (PLOs)

Upon completion of the program, learners are expected to possess the following 10 qualifications and competencies:

- **Knowledge Domain (Theoretical Knowledge)**
 - PLO 1: Demonstrate comprehensive theoretical and practical knowledge in Computer Science, Computer Science Education, and Technical and Vocational Education and Training, including course content, curriculum development, and pedagogical principles relevant to upper secondary technical education.
- **Analytical and Critical Thinking Skills**
 - PLO 2: Apply cognitive skills such as analysis, synthesis, evaluation, and innovation, to solve problems, conduct research, and improve teaching and learning in Computer Science and Computer Science Education.
- **Psychomotor Skills (Practical Skills)**
 - PLO 3: Demonstrate proficiency in performing computer science-related practical tasks and effectively guide learners in laboratory, workshop, and classroom environments with precision and professionalism.
- **Interpersonal and Responsibility Skills**
 - PLO 4: Collaborate effectively with colleagues, learners, and institutional stakeholders through teamwork, leadership, empathy, and mutual respect in both academic and professional contexts.
 - PLO 5: Exhibit accountability, reliability, and a strong sense of professional responsibility in carrying out teaching, research, and institutional duties.
 - PLO 6: Maintain high standards of accuracy and precision by demonstrating attention to detail in planning, execution, and evaluation of technical and educational tasks.
 - PLO 7: Uphold professional ethics and safety standards in all academic, research, and community activities, demonstrating integrity, care, and compliance with institutional and national regulations, while engaging in continuous professional growth and lifelong learning.
- **Numeracy, ICT, and Communication Skills**
 - PLO 8: Communicate effectively in oral, written, and visual forms in both Khmer and English for academic, instructional, and professional purposes.
 - PLO 9: Utilize digital technologies, ICT tools, and learning management systems effectively in teaching, learning, and research to enhance digital pedagogy and innovation.
 - PLO 10: Apply quantitative reasoning, data analysis, and statistical tools to support educational research, assessment, and evidence-based decision-making.

3. Curriculum Framework and Implementation Principles

The Technical Education Pathway is structured as a rigorous two-year academic program encompassing four semesters. To successfully complete the program, candidates must adhere to the following framework and implementation milestones:

- **Total Credits:** A minimum accumulation of 47 credits is required for graduation.
- **Course Distribution:** The credits are strategically distributed across four highly integrated groups:

- *Common and Pedagogy Courses*: 16 credits
- *Specific Field Courses*: 14 credits
- *Teaching Practicum and School Mentoring*: 5 credits
- *Master's Degree Thesis*: 12 credits
- **Credit System (CQF)**: The program operates on a standardized system governed by the Cambodian Qualifications Framework. One theoretical credit equates to at least 15 hours of lectures per semester; one practical or laboratory credit corresponds to at least 32 hours of applied practice.
- **Academic Standing**: Learners must maintain a minimum Grade Point Average (GPA) of 2.50 (equivalent to a score of 65% or higher) to qualify for graduation.
- **Qualification Examination**: All candidates are required to pass a comprehensive assessment—covering general knowledge, core skills, and specialized subjects—after completing at least 80% of their coursework. Successful completion is a mandatory prerequisite for advancing to the thesis proposal defense.

4. Detailed Course Descriptions and Credit Allocation

4.1. Common and Pedagogy Subjects (16 Credits)

The pedagogical component requires learners to complete at least 16 credits designed to build a strong foundation in instructional science and educational leadership. The basic pedagogy cluster includes:

- **Adult Psychology (2 credits)**: Explores the cognitive and motivational factors influencing adult learners to aid in the design of learner-centered technical instruction.
- **Teaching Method and Didactics in Technical Education (3 credits)**: Equips candidates with crucial strategies for instructional planning, microteaching, and competency-based delivery.
- **Technical Curriculum Implementation (3 credits)**: Focuses on the translation of national competency standards into actionable teaching plans and resource management.
- **Action Research in Technical Education (2 credits)**: Provides a framework for teachers to systematically investigate and refine their own classroom practices through evidence-based methodologies.

Complementing these are the core pedagogy subjects, requiring 6 credits. These include:

- Computer Science Course Preparation with ICT (2 credits)
- Computer Science Class Management (2 credits): Covers educational administration and quality assurance.
- Computer Science Education Assessment (2 credits): Details the quantitative and qualitative metrics used to evaluate technical learning outcomes.

4.2. Specific Field Subjects (14 Credits)

To guarantee high-level technical proficiency, candidates must complete a minimum of 14 credits in advanced Computer Science disciplines. The core technical requirements encompass 12 credits. These include:

- **System and Network Administration (3 credits):** Provides deep insights into secure network deployment using virtualization and containerization technologies.
- **Web Development (3 credits):** Offers a comprehensive exploration of full-stack application creation, utilizing Vue.js for responsive front-end design and Laravel for robust server-side architecture.
- **Advanced Algorithms (2 credits):** Challenges students with complex computational problem-solving, including dynamic programming and graph algorithms.
- **Database Management System (2 credits):** Focuses on advanced data modeling, optimization, and distributed architectures.
- **Internet of Things and Cloud Technology (2 credits):** Explores system connectivity, cloud infrastructure, and hands-on sensor data integration.
- **IT Project Management (2 credits):** Covers industry-standard methodologies such as Agile and Waterfall for executing technology initiatives.

Additionally, learners must complete 2 elective courses (4 credits total) selected from specialized offerings. These electives include:

- **Artificial Intelligence (2 credits):** Introduces core concepts and techniques of AI, including machine learning, neural networks, natural language processing, and computer vision for problem-solving.
- **Digital Marketing (2 credits):** Covers strategies, tools, and practices of digital marketing, including SEO, social media, content marketing, and web analytics to develop effective campaigns.
- **Graphic Design (2 credits):** Explores principles of visual communication, typography, and color theory, providing hands-on experience with industry-standard software like Adobe Photoshop and Illustrator.
- **Video Editing and Motion Design (2 credits):** Introduces video composition, editing workflows, motion graphics, and visual effects using software such as Adobe Premiere Pro and After Effects.
- **English for ICT (2 credits):** Strengthens English proficiency for academic and professional communication in computer science, focusing on technical writing, reports, presentations, and instructional communication.

4.3. Teaching Practicum and Pedagogical Mentoring (5 Credits)

A defining feature of this third pathway is the mandatory clinical experience:

- **Teaching Practicum (3 credits):** Requires candidates to immerse themselves in real classroom environments at general or technical high schools for a minimum of 120 hours. During this practicum, candidates must independently prepare lesson plans, manage classroom dynamics, and evaluate student performance in both theoretical and workshop settings.
- **Pedagogical Mentoring (2 credits):** Mandates weekly scheduled consultations with a designated teaching supervisor. These sessions provide vital feedback on instructional strategies, material selection, and pedagogical refinement to deeply support the clinical practice.

4.4. Master's Degree Thesis (12 Credits)

The culmination of the Technical Education Pathway is an applied research project carrying 12 credits, divided into two distinct phases:

- **Master's Degree Thesis I (6 credits):** Involves the development of a comprehensive research proposal that addresses a specific challenge within technical education or computer science instruction. Candidates must rigorously defend this proposal—comprising an introduction, literature review, and methodology—before an evaluation committee.
- **Master's Degree Thesis II (6 credits):** Upon successful defense of Thesis I, candidates advance to this final phase. Candidates execute their research design, collect and analyze data, and synthesize their findings into a final academic report. The degree is awarded only after the successful public defense of the completed thesis.

4.5. Summary of Curriculum Courses and Credits

Category / Subject Group	Course Title	Credits
1. Common and Pedagogy Subjects	<i>(Minimum 16 Credits)</i>	
<i>Basic Pedagogy</i>	Adult Psychology	2
	Teaching Method and Didactics in Technical Education	3
	Technical Curriculum Implementation	3
	Action Research in Technical Education	2
<i>Core Pedagogy</i>	Computer Science Course Preparation with ICT	2
	Computer Science Class Management	2
	Computer Science Education Assessment	2
2. Specific Field Subjects	<i>(Minimum 14 Credits)</i>	
<i>Core Specialized</i>	System and Network Administration	3
	Web Development	3
	Advanced Algorithms	2
	Database Management System	2
	Internet of Things and Cloud Technology	2
	IT Project Management	2
<i>Electives (Choose at least 4 credits)</i>	Artificial Intelligence	2
	Digital Marketing	2
	Graphic Design	2
	Video Editing and Motion Design	2
	English for ICT	2
3. Teaching Practicum and Mentoring	<i>(Minimum 5 Credits)</i>	
	Teaching Practicum	3
	Pedagogical Mentoring	2
4. Master's Degree Thesis	<i>(12 Credits)</i>	
	Master's Degree Thesis I	6
	Master's Degree Thesis II	6
Total Requirements		47 Credits

4.6. Proposed Semester-Based Course Alignment

To ensure seamless integration with the existing engineering programs at the Institute of Technology of Cambodia, the following table maps the M.Ted coursework across four semesters. This structure aligns the shared specific field subjects with the Engineering Year 4 and Year 5 schedules, establishing common courses across the pathways.

Note: The 3-credit Web Development course is split into Web Development I (1.5 credits) and Web Development II (1.5 credits) across Semesters 1 and 2 to align with the engineering schedule.

Academic Term	Course Title	Category	Common Course	Credits
Semester 1	Web Development I	Core Specialized	Yes, Year 4	1.5
	Advanced Algorithms	Core Specialized	Yes, M1	2
	Artificial Intelligence	Elective	Yes, M1	2
	Adult Psychology	Basic Pedagogy	No	2
	Teaching Method and Didactics in Technical Education	Basic Pedagogy	No	3
	Computer Science Course Preparation with ICT	Core Pedagogy	No	2
	Graphic Design	Elective	No	2
	Semester 1 Total			14.5
Semester 2	System and Network Administration	Core Specialized	Yes, Year 4	3
	Web Development II	Core Specialized	Yes, Year 4	1.5
	Database Management System	Core Specialized	Yes, Year 4	2
	Internet of Things and Cloud Technology	Core Specialized	Yes, Year 4	2
	Technical Curriculum Implementation	Basic Pedagogy	No	3
	Computer Science Class Management	Core Pedagogy	No	2
	English for ICT	Elective	Yes, Year 5	2
	Semester 2 Total			15.5
Semester 3	IT Project Management	Core Specialized	Yes, Year 5	2
	Action Research in Technical Education	Basic Pedagogy	No	2
	Computer Science Education Assessment	Core Pedagogy	No	2
	Digital Marketing	Elective	No	2
	Video Editing and Motion Design	Elective	No	2
	Master's Degree Thesis I	Thesis	No	6
	Semester 3 Total			16
Semester 4	Teaching Practicum	Practicum&Mentoring	No	3
	Pedagogical Mentoring	Practicum&Mentoring	No	2
	Master's Degree Thesis II	Thesis	No	6
	Semester 4 Total			11

5. Quality Assurance and Faculty Requirements

To ensure the program meets rigorous academic and professional standards, the Institute of Technology of Cambodia will implement stringent quality assurance mechanisms:

- **Subject Instructors:** Faculty members serving as subject instructors must hold at least a Master's Degree in a relevant field and possess substantial professional teaching experience.
- **Thesis Supervisors:** Supervisors and technical advisors are required to have a demonstrable record of research publication and academic mentorship in technical education at the national, regional, or international level.
- **Joint Quality Assessments:** Continuous evaluation involving internal committees and external stakeholders from the Ministry of Education, Youth and Sport will be conducted at least every four years. This cycle guarantees that the program's curriculum, instructional resources, and graduate outcomes remain exceptionally aligned with the evolving demands of Cambodia's technical labor market.

6. Conclusion and Request for Approval

The proposed Technical Education Pathway for the Master's Degree in Teaching Computer Science represents a strategic and timely expansion of the Institute of Technology of Cambodia's academic portfolio. By bridging the critical gap between high-level technological expertise and advanced pedagogical proficiency, this pathway directly supports the Royal Government of Cambodia's Pentagonal Strategy Phase I and the MoEYS's agenda for TVET enhancement.

Through a meticulously structured 47-credit curriculum that balances common pedagogical foundations, specialized computer science applications, clinical teaching practicums, and applied educational research, ITC is uniquely positioned to cultivate a new generation of technical educators. These graduates will not only meet national qualification standards but will also serve as catalysts for improving the quality of STEM and technical education at the upper secondary level across the nation.

We respectfully submit this proposal to the Consortium for review and formally request the approval and accreditation of the Technical Education Pathway (M.Ted). Its successful implementation will solidify ITC's role as a premier institution driving sustainable human resource development and technological advancement in Cambodia.