AUN-QA SELF-ASSESSMENT REPORT

Master of Engineering in Acoustics and Multimedia Technology

Institute of Music Science and Engineering

King Mongkut's Institute of Technology Ladkrabang

LIST OF ABBREVIATIONS

Abbreviations	Description
KMITL	King Mongkut's Institute of Technology Ladkrabang
IMSE	Institute of Music Science and Engineering
ELO	Expected Learning Outcome (comparable to Program Learning Outcome: PLO)
CLO	Course Learning Outcome
TQF	Thai Qualifications Framework
TQF2	Thai Qualifications Framework: Program Specification
TQF3	Thai Qualifications Framework: Course Specification
TQF5	Thai Qualifications Framework: Course Report
T&LA	Teaching-Learning Activities
LMS	Learning Management System

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I. INTRODUCTION

Executive Summary

The Master of Engineering in Acoustics and Multimedia Technology is a newly established program at the Institute of Music, Science, and Engineering (IMSE), King Mongkut's Institute of Technology Ladkrabang (KMITL). The program was first offered in 2024 and currently has a small student intake, with three students enrolled in the first cohort. The program was designed in compliance with the Thailand Qualification Framework (TQF) and the AUN-QA framework, ensuring alignment with national and international standards of graduate education.

The program clearly defines its Expected Learning Outcomes (ELOs), which are aligned with Bloom's taxonomy and mapped against the vision and mission of both KMITL and IMSE. These ELOs reflect the needs of stakeholders, including industry, alumni, students, and academic staff. The curriculum structure demonstrates progression from foundational courses to advanced and specialized courses, culminating in a thesis that integrates knowledge, research, ethics, and communication skills. Teaching and learning activities emphasize active learning, seminars, research training, and integration of practice and theory, while assessment strategies employ rubrics, presentations, and thesis supervision. Student support services, such as modern studios, laboratories, digital resources, and library facilities, are available, though areas such as English language writing support and new software adoption are still under development.

Academic staff are qualified with expertise in acoustics, audio engineering, and multimedia technology, and their competences are aligned with the needs of the program. Facilities and infrastructure are up-to-date, with calibrated sound measurement equipment, Dolby Atmos certified studios, and plans for further acquisition such as an impedance tube and AI-assisted writing tools (QuillBot). Weaknesses remain in the limited student intake, the relatively early stage of industry engagement, and the need for a more systematic framework for student support and well-being. Improvement plans are already underway to address these issues.

Overall Program Rating: Based on the self-assessment, the program achieves an average score of approximately 3.7–3.8 out of 7, indicating a quality level of "adequate with some strengths," with clear potential for future development and growth.

Overview of The University, Faculty, Department

King Mongkut's Institute of Technology Ladkrabang (KMITL)

King Mongkut's Institute of Technology Ladkrabang (KMITL) was founded under the King Mongkut's Institute of Technology Act of 1985, alongside King Mongkut's Institute of Technology Thonburi and King Mongkut's Institute of Technology North Bangkok, as part of a national effort to strengthen education and research in science and technology. As a legal entity, it was designated as a university affairs office with the mandate to provide teaching, conduct research, deliver academic services, and preserve Thai arts and culture. On March 8, 2008, KMITL officially became an autonomous university, a change announced in the Royal Thai Government Gazette, granting it greater independence and flexibility in governance. The Institute carries the royal emblem *Phra Maha Mongkut*, bestowed by His Majesty King Bhumibol Adulyadej, symbolizing its auspicious foundation and strong royal connection. Its name also pays tribute to Chaophraya Surawong Waiyawat (commonly known as Chao Khun Thahan), in honor of whose heir, Ms. Liam Protpittayapayat, donated the land for the university. Of the 1,665.6 rai donated, 1,345.6 rai was allocated to KMITL while the remaining 320 rai was reserved for Protpittayapayat School, reflecting the spirit of generosity and commitment to education that underpins the institute's origins.

Philosophy

Education and research in science and technology are considered an excellent foundation for national development. This philosophy guides KMITL's role as a leading higher education institution in Thailand, dedicated to advancing knowledge and serving society.

Goals

KMITL strives to provide high-quality education and advanced research to develop human resources with strong knowledge in science and technology as well as ethics. At the same time, the institute is committed to preserving the arts and culture of the country, reflecting a holistic approach to education.

Vision (2017–2027)

"Aim to be the world master of Innovation; to create cutting-edge research and innovation to serve global society and to develop the country through science and technology."
This vision highlights KMITL's aspiration to lead in innovation and to play a global role in advancing knowledge and technology for sustainable progress.

Missions

In accordance with the Institute's Act, KMITL's missions consist of four key aspects:

1. To provide high-quality education.
2. To conduct research and generate innovation.
3. To provide academic and professional services to society.
4. To preserve and promote Thai arts and culture.

Core Values: FIGHT

KMITL embodies its institutional identity through the acronym **FIGHT**, representing:

- **F**: **Future Orientation** – Envisioning and shaping the future through innovation.
- **I**: **Integrity** – Promoting honesty, responsibility, and transparency.
- **G**: **Globalization** – Strengthening international perspectives and collaborations.
- **H**: **Humanity** – Serving society with compassion and ethical commitment.
- **T**: **Teamwork** – Working collaboratively across disciplines and communities.

Institute of Music, Science, and Engineering (IMSE)

The Institute of Music, Science, and Engineering (IMSE) at King Mongkut's Institute of Technology Ladkrabang was established in 2018 as the pioneering academic institute in Thailand offering a *Bachelor of Engineering in Acoustics and Audio Engineering*, reflecting KMITL's commitment to bridging science, engineering, and the arts. In 2021, IMSE expanded into postgraduate education with a *Master of Engineering in Acoustics and Multimedia Technology*, followed in 2022 by the launch of a *Bachelor of Arts in Creative Arts Technology*, reinforcing its interdisciplinary mission. With around 200 students enrolled, IMSE emphasizes both academic excellence and professional practice by engaging external experts with industry experience, and all programs follow AUN-QA standards for quality assurance and international benchmarking. Guided by its **vision** of *integrating art, engineering, and science to elevate the quality of life for humanity*, IMSE's **mission** is to *produce acoustics and audio engineers, as well as creative technology artists, who can create work, solve problems, promote quality of life, and bring happiness to society*. Its **core competency** lies in the *integration of art, engineering, and science* to foster innovation and solve interdisciplinary challenges. IMSE is further shaped by its **values (3C)**: *Coach* (improve, help, support), *Care* (well-being, empathy), and *Concern* (proactive, attentive), as well as an organizational culture that emphasizes teamwork, mutual support, and collective achievement. Through its programs, research,

and services, IMSE continues to position itself as a hub of creativity and innovation that connects technology and the arts for societal impact.

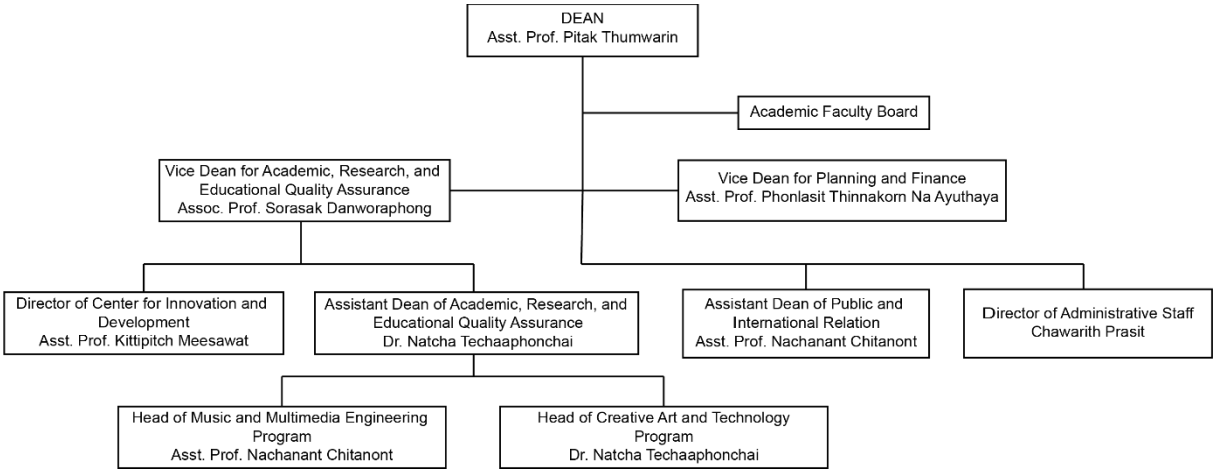

Figure 1. Organizational Chart of the Institutue of Music, Science, and Engineering, King Mongkut's Institute of Technology Ladkranbang.

Development of the SAR

This Self-Assessment Report (SAR) was prepared by the program director together with the program administrative committees of the Institute of Music, Science, and Engineering (IMSE), King Mongkut's Institute of Technology Ladkrabang (KMITL). Academic and support staff of the program contributed essential information for completing the assessment criteria. The first draft was circulated among faculty members and staff for comments and suggestions, and the final version will be submitted for internal quality assurance assessment by KMITL in the academic year 2025.

The master's program was officially established in 2021 (B.E. 2564). In 2024, the program admitted its first group of students, and therefore this SAR is the first assessment report prepared for the program.

II. AUN-QA CRITERIA REQUIREMENTS

1. Expected Learning Outcomes

1.1. The program to show that the expected learning outcomes are appropriately formulated in accordance with an established learning taxonomy, are aligned to the vision and mission of the university and are known to all stakeholders.

The Master of Science in Acoustics and Multimedia Technology program ensures that its Expected Learning Outcomes (ELOs) are well formulated, measurable, and consistent with international standards of higher education. The ELOs are explicitly constructed based on Bloom's taxonomy to cover cognitive, psychomotor, and affective domains at levels appropriate for graduate education. This systematic formulation guarantees clarity in expected competencies, measurability of outcomes, and progression of higher-order learning skills.

The ELOs are directly aligned with the vision and mission of King Mongkut's Institute of Technology Ladkrabang (KMITL) and the Institute of Music, Science, and Engineering (IMSE), which emphasize integration of science, engineering, and creative technology for innovation and societal benefit. As shown in Table 1.1.1, each ELO is mapped with the program's intended contribution to KMITL's and IMSE's strategic directions.

Furthermore, the ELOs are formulated to respond to stakeholder expectations, which were systematically collected through interviews and consultations with academic experts, industry representatives, and current students. This process ensures that graduates are prepared for diverse roles in academia, industry, and society. As shown in Table 1.1.2, the mapping highlights the relevance of specific ELOs to key stakeholders, including industry partners, academic experts, students, alumni, and the broader community..

To strengthen academic rigor, the ELOs are also mapped against Bloom's taxonomy to ensure the appropriate level of cognitive demand, psychomotor skills, and affective learning outcomes for a master's program. This mapping, presented in Table 1.1.3, illustrates that the program outcomes progress from foundational understanding and application to higher levels of analysis, creation, and ethical responsibility.

Together, these mappings assure that the program's ELOs are:

- Appropriately formulated in accordance with established learning taxonomies.
- Aligned with the vision and mission of KMITL and IMSE.

- Transparent and relevant to all stakeholders, ensuring recognition of the quality and value of the graduates produced.

Table 1.1.1: Alignment of Program ELOs with PLOs, Vision, and Mission

ELOs	TQF Domain	Mapped PLOs (1.1–6.3)	Alignment with KMITL Vision/Mission	Alignment with IMSE Vision/Mission
ELO1: Demonstrate ethical behavior and academic integrity	1. Ethics & Moral	5.1, 5.2, 5.3	Supports KMITL's core values: Integrity, Good Governance	Upholds IMSE's mission to foster ethics and professional responsibility
ELO2: Apply advanced knowledge in acoustics and multimedia	2. Knowledge	1.1, 1.2, 1.3	Contributes to KMITL's goal of advancing science & technology	Supports IMSE's mission to integrate art, science, and engineering
ELO3: Critically analyze, synthesize, and evaluate information for problem solving	3. Cognitive Skills	2.1, 2.2, 2.3	Aligns with KMITL's vision of academic excellence	Fulfills IMSE's mission to solve interdisciplinary problems
ELO4: Design and conduct research in acoustics and multimedia	3. Cognitive Skills	3.1, 3.2, 3.3	Supports KMITL's mission to foster innovation	Matches IMSE's mission in research and creation of new knowledge
ELO5: Demonstrate practical and professional skills in acoustics, audio, and multimedia	3. Cognitive / 5. Numerical & Practical	1.2, 2.3, 3.2	KMITL's mission to produce competent professionals	IMSE's mission to produce skilled graduates with hands-on capability
ELO6: Communicate effectively in Thai and English using appropriate media	5. Communication & IT Skills	3.4, 4.1, 4.2	Supports KMITL's global competitiveness vision	IMSE's mission to produce internationally competitive graduates

ELO7: Utilize digital tools and data analysis techniques for research and innovation	**5. Numerical & IT**	**3.2, 3.3**	**Aligns with KMITL's vision of digital innovation**	**Supports IMSE's mission to combine technology with creative arts**
ELO8: Exhibit leadership, teamwork, and responsibility to society	**4. Interpersonal Skills**	**6.1, 6.2, 6.3**	**Supports KMITL's vision of social responsibility and leadership**	**IMSE's value: teamwork, collaboration, and enhancing quality of life**

Table 1.1.2: Alignment of Program ELOs with Stakeholders' Key Expectations

Stakeholders	Key Expectations	Relevant ELOs
Industry Partners	Strong technical skills, research application, ethics	1.2, 1.3, 2.2, 2.3, 5.1–5.3
Academic Experts	Research design, critical analysis, academic advancement	1.1, 1.3, 2.1, 2.2, 3.1, 3.2
Students	Knowledge + practice, communication, teamwork, career readiness	1.1–1.2, 3.4, 4.1, 4.2, 6.1–6.3
Alumni	Competitive job markets, international perspectives	2.2, 3.1, 4.1, 4.2
Society / Community	Ethical graduates, sustainable innovation, community service	5.1–5.3, 6.3

Table 1.1.3: Alignment of Program ELOs with Bloom's Taxonomy Domain and its Cognitive Level

ELO	Description	Bloom's Taxonomy Domain	Cognitive Level
1.1	Explain theories and principles of acoustics and multimedia technology	Cognitive	**Understand / Apply**
1.2	Demonstrate practical skills in acoustics and multimedia technology	Psychomotor	**Apply**
1.3	Integrate new knowledge for development in national and international contexts	Cognitive	**Analyze / Create**
2.1	Analyze issues and evaluate data in acoustics and multimedia	Cognitive	**Analyze / Evaluate**
2.2	Initiate and develop new knowledge for research	Cognitive	**Create**
2.3	Conduct research and apply knowledge to solve problems	Cognitive & Psychomotor	**Apply / Create**

3.1	Plan and design research in acoustics and multimedia	Cognitive	**Apply / Create**
3.2	Perform numerical and statistical analysis	Cognitive	**Apply / Analyze**
3.3	Use IT effectively for research	Cognitive	**Apply**
3.4	Write academic reports in English	Cognitive + Affective	**Apply / Create**
4.1	Present research using appropriate media	Cognitive + Psychomotor	**Apply**
4.2	Communicate effectively in English	Cognitive + Affective	**Apply / Evaluate**
5.1	Demonstrate honesty	Affective	**Value**
5.2	Show diligence and perseverance	Affective	**Value / Internalize**
5.3	Adhere to research ethics	Affective	**Value / Internalize**
6.1	Demonstrate leadership and followership	Affective	**Value / Organize**
6.2	Work collaboratively with others	Affective	**Value / Organize**
6.3	Show responsibility to self and society	Affective	**Value / Internalize**

1.2. The program to show that the expected learning outcomes for all courses are appropriately formulated and are aligned to the expected learning outcomes of the program.

The program ensures that all Expected Learning Outcomes (ELOs) are systematically aligned with the course-level learning outcomes (CLOs) of both compulsory and elective courses. Table 1.2.1 presents this alignment, demonstrating how each course contributes to the fulfillment of program-level outcomes.

- **Compulsory courses** (*Advanced Signal Processing, 19018101* and *Advanced Topics on Sound and Vibration, 19018102*) provide essential theoretical and analytical foundations in acoustics and multimedia technology. These courses directly support ELOs related to disciplinary knowledge, advanced analytical problem-solving, and research design.
- **Elective courses** allow students to tailor their specialization according to their interests and research direction. Specifically:
    - *Advanced Sound Recording and Mixing (19018201)* develops professional audio production and post-production skills, supporting practice-based and applied ELOs.

- *Advanced Measurement Techniques (19018202)* enhances experimental skills in instrumentation and data collection, strengthening analytical and research competencies.
- *Human Perception of Sound (19018203)* introduces psychoacoustics and auditory perception, connecting engineering knowledge with human-centered applications.
- *Musical Acoustics (19018204)* explores the acoustic science of musical instruments and performance, encouraging interdisciplinary knowledge creation.
- *Sound Visualization Technology (19018205)* equips students with computational and experimental tools for acoustic analysis, supporting innovation and digital applications.
- *Noise Control (19018206)* emphasizes practical approaches for solving environmental and industrial noise problems, ensuring relevance to industry and society.
- *Building Technology (19018207)* links acoustics to architecture and sustainable building design, highlighting applied solutions to real-world problems.

- **Seminars (19018701–19018704)** develop academic communication, critical discussion, and ethical awareness, preparing students to disseminate knowledge to academic and professional audiences.
- **Thesis (19018801 or 19018901)** serves as the capstone of the program, integrating knowledge and skills acquired across courses to produce original research. This directly addresses ELOs related to innovation, leadership, knowledge creation, and societal responsibility.

Together, these courses ensure that all program ELOs are comprehensively supported. Compulsory courses provide core foundations, electives enable specialization, seminars foster communication and ethics, and the thesis ensures integration and independent scholarly contribution.

Table 1.2.1: Alignment of Program ELOs to Course Learning Outcomes (CLOs)

Program ELO	Description	Related Courses (with CLOs)	Study Year
ELO 1: Ethics	Demonstrate honesty, diligence, perseverance, professional ethics, and responsibility to society.	19018101 Advanced Signal Processing (CLO1), 19018102 Advanced Topics on Sound & Vibration (CLO1), 19018201 Advanced Recording & Mixing (CLO1), 19018206 Noise Control (CLO1), 19018701–19018704 Seminars (CLO1), 19018801/19018901 Thesis (CLO1)	Year 1–2
ELO 2: Knowledge	Explain and integrate advanced theories and principles of acoustics and multimedia technology for national and international innovation.	19018101 Advanced Signal Processing (CLO2), 19018102 Advanced Topics on Sound & Vibration (CLO2), 19018202 Advanced Measurement Techniques (CLO2), 19018203 Human Perception of Sound (CLO2), 19018204 Musical Acoustics (CLO2), 19018207 Building Technology (CLO2), 19018801/19018901 Thesis (CLO2)	Year 1–2
ELO 3: Cognitive Skills	Apply analytical, critical, and research skills to solve complex problems and develop innovations in acoustics and multimedia technology.	19018101 Advanced Signal Processing (CLO3), 19018201 Advanced Recording & Mixing (CLO3), 19018205 Acoustic Visualization Technology (CLO3), 19018206 Noise Control (CLO3), 19018701–19018704 Seminars (CLO2–CLO3), 19018801/19018901 Thesis (CLO3–CLO5)	Year 1–2
ELO 4: Research & Innovation	Initiate, design, and conduct research; generate new knowledge or innovations for publication and real-world application.	19018202 Advanced Measurement Techniques (CLO3), 19018205 Acoustic Visualization Technology (CLO4), 19018701–19018704 Seminars (CLO3–CLO4), 19018801/19018901 Thesis (CLO3–CLO6)	Year 1–2

ELO 5: Numerical & IT Skills	Perform statistical analysis, utilize IT tools, and apply quantitative methods for problem-solving and research.	19018101 Advanced Signal Processing (CLO5), 19018202 Advanced Measurement Techniques (CLO5), 19018203 Human Perception of Sound (CLO5), 19018205 Acoustic Visualization Technology (CLO5), 19018701–19018704 Seminars (CLO5), 19018801/19018901 Thesis (CLO5)	Year 1–2
ELO 6: Communication	Communicate effectively in English through academic writing, reports, and oral presentations using appropriate media.	19018203 Human Perception of Sound (CLO4), 19018204 Musical Acoustics (CLO4), 19018701–19018704 Seminars (CLO4–CLO5), 19018801/19018901 Thesis (CLO5)	Year 1–2
ELO 7: Interpersonal Skills & Responsibility	Show leadership, teamwork, accountability, and adaptability in academic and professional contexts.	19018207 Building Technology (CLO3), 19018701–19018704 Seminars (CLO4), 19018801/19018901 Thesis (CLO4)	Year 1–2
ELO 8: Global & Societal Responsibility	Demonstrate awareness of global perspectives, social responsibility, and application of acoustics and multimedia technology for societal benefit.	19018206 Noise Control (CLO4), 19018207 Building Technology (CLO4), 19018701–19018704 Seminars (CLO4–CLO5), 19018801/19018901 Thesis (CLO6)	Year 2

1.3. The program to show that the expected learning outcomes consist of both generic outcomes (related to written and oral communication, problem-solving, information technology, teambuilding skills, etc) and subject specific outcomes (related to knowledge and skills of the study discipline).

The program ensures that its Expected Learning Outcomes (ELOs) encompass both subject-specific outcomes and generic outcomes in order to provide graduates with a holistic skillset. The subject-specific outcomes focus on advanced knowledge and skills in acoustics and multimedia technology, including theoretical understanding, practical competence, research design, and

problem-solving within the discipline. These are directly cultivated through specialized courses such as *Advanced Signal Processing*, *Advanced Topics on Sound and Vibration*, *Advanced Measurement Techniques*, *Noise Control*, *Musical Acoustics*, and the *Thesis*.

In parallel, the program emphasizes generic outcomes that prepare students for broader professional and societal roles. These outcomes include written and oral communication, teamwork, leadership, ethical awareness, problem-solving, and effective use of information technology. They are integrated throughout the curriculum via *Seminars*, group projects, and research components, ensuring that graduates can communicate effectively, collaborate with others, and uphold professional integrity.

Table 1.3.1 presents the classification of the program's ELOs into subject-specific and generic categories, together with their alignment to relevant courses and academic components. This mapping demonstrates that the program outcomes are comprehensive, covering both disciplinary expertise and transferable skills essential for academic, industry, and societal contexts.

Table 1.3.1 Classification of Program Expected Learning Outcomes (ELOs)

ELO	Description	Category	Related Courses / Components
ELO 1: Ethics	Demonstrate honesty, diligence, perseverance, professional ethics, and responsibility to society.	Generic	Seminars (19018701–19018704), Thesis (19018801/19018901)
ELO 2: Knowledge	Explain and integrate advanced theories and principles of acoustics and multimedia technology for innovation at national and international levels.	Subject-Specific	19018101 Advanced Signal Processing, 19018102 Advanced Topics on Sound & Vibration, 19018204 Musical Acoustics
ELO 3: Cognitive Skills	Apply analytical, critical, and problem-solving skills in acoustics and multimedia technology.	Subject-Specific	19018202 Advanced Measurement Techniques, 19018206 Noise Control, Thesis
ELO 4: Research & Innovation	Initiate, design, and conduct research; synthesize new knowledge and develop innovations.	Subject-Specific	Thesis, 19018207 Building Technology, Seminars

ELO 5: Numerical & IT Skills	Perform quantitative analysis, statistics, and utilize information technology tools effectively for research.	Generic	19018101 Advanced Signal Processing, 19018205 Acoustic Visualization Technology, Thesis
ELO 6: Communication	Communicate effectively in English through academic writing, reports, and oral presentations using appropriate media.	Generic	Seminars (19018701–19018704), 19018203 Human Perception of Sound, Thesis defense
ELO 7: Interpersonal Skills & Responsibility	Show leadership, teamwork, accountability, and adaptability in academic and professional contexts.	Generic	19018201 Advanced Sound Recording and Mixing (group projects), Seminars, Elective courses
ELO 8: Global & Societal Responsibility	Demonstrate awareness of global perspectives and apply acoustics and multimedia technology for societal benefit.	Generic	19018206 Noise Control, 19018207 Building Technology, Thesis

1.4. The program to show that the requirements of the stakeholders, especially the external stakeholders, are gathered, and that these are reflected in the expected learning outcomes.

During the development of the Master of Engineering in Acoustics and Multimedia Technology curriculum, requirements from both internal and external stakeholders were systematically collected and analyzed to ensure that the program's Expected Learning Outcomes (ELOs) reflect the actual needs of society, industry, and academia.

Stakeholders were categorized into two major groups (see Table 1.4.1):

- External stakeholders included private companies, state enterprises, government agencies, and external academic experts. Their feedback highlighted the demand for graduates with strong problem-solving abilities in acoustics and multimedia technology, advanced measurement and analysis skills, effective communication, teamwork, and adaptability to rapidly changing technologies.
- Internal stakeholders consisted of current students, alumni, and faculty members. Their input provided insights into the adequacy of existing courses, the need for more practical training,

research opportunities, and exposure to emerging topics such as noise control, human perception of sound, and multimedia applications.

Feedback was gathered through surveys, interviews, brainstorming sessions, and formal meetings. Results were carefully mapped into the program's six ELOs to ensure that the curriculum not only addresses disciplinary knowledge and skills but also generic competencies such as communication, teamwork, ethical responsibility, and life-long learning. Therefore, the requirements of stakeholders are explicitly reflected in the formulation of the ELOs, and consequently in the design of the curriculum structure and the Course Learning Outcomes (CLOs). This ensures that graduates of the program are well-prepared to contribute effectively to their professions and meet the expectations of employers and society.

Table 1.4.1. Stakeholder Requirements Mapped to Program ELOs

Stakeholder Group	Requirements / Expectations	Reflected in Program ELOs (New, 8 items)
Employers (Private companies, SOEs, Government agencies)	Apply acoustics and multimedia knowledge in real-world contexts; teamwork; problem-solving; professional ethics.	**ELO2** (Knowledge), **ELO3** (Practical/Cognitive application), **ELO7** (Teamwork & Leadership), **ELO1** (Ethics)
Academic Staff	Strong foundation in theory and practice; ability to conduct research; readiness for advanced study.	**ELO2** (Knowledge), **ELO3** (Application), **ELO4** (Research skills), **ELO8** (Lifelong learning)
Current Students (Senior Year)	Practical labs & projects; use of IT tools; career preparation.	**ELO3** (Application), **ELO5** (Numerical & IT skills), **ELO6** (Communication), **ELO7**(Teamwork), **ELO8** (Lifelong learning)
Alumni	Adaptability; communication skills; technological awareness.	**ELO6** (Communication), **ELO5** (IT), **ELO8**(Lifelo ng learning)
University (KMITL / IMSE)	Global outlook; ethics; social responsibility; innovation.	**ELO1** (Ethics), **ELO8** (Responsibility & lifelong learning), **ELO2** (Knowledge for innovation)

1.5. The program to show that the expected learning outcomes are achieved by the students by the time they graduate.

All students are in their first year.

2. PROGRAM SPECIFICATION

Since 2009, the Office of Higher Education Commission (OHEC), Ministry of Education, has enforced Outcome-Based Education (OBE) in Thailand through the Thailand Qualifications Framework for Higher Education (TQF:HEd). This framework provides the national guideline that all academic programs must adhere to in order to ensure quality, comparability, and accountability in higher education.

Accordingly, the Master of Science Program in Acoustics and Multimedia Engineering was originally developed in line with TQF requirements to meet the increasing demand for professionals in acoustics, audio engineering, and multimedia technology. In compliance with continuous quality assurance and to align with emerging trends in research and industry, the program was revised in 2025.

The program structure and specifications are documented in the official TQF2 form, while individual course specifications are provided in the TQF3 documents. The revised curriculum emphasizes the integration of science, engineering, and creative technology to develop graduates with advanced knowledge, strong research capacity, and professional competence that meet both academic and industry needs.

2.1 The specifications of the program and all its courses are shown to be comprehensive, up-to-date, and made available and communicated to all stakeholders

The Master of Engineering in Acoustics and Multimedia Technology is designed in compliance with the Thailand Qualifications Framework (TQF) as mandated by the Office of Higher Education Commission (OHEC). The program was most recently revised in 2025 to ensure that its structure, learning outcomes, and course contents remain up-to-date and relevant to academic, professional, and industry needs.

The overall program specification is documented in the official TQF2, while the detailed course specifications are presented in the TQF3 documents. These specifications comprehensively cover expected learning outcomes (ELOs), program structure, course descriptions, teaching and learning methods, and assessment criteria.

To ensure transparency and accessibility, the program specifications are:

- Published in the official TQF documents and made available to the university administration and external quality assurance bodies.
- Communicated to students and faculty through program handbooks, student orientation sessions, and academic advising.
- Made accessible online via the official website of the Institute of Music, Science, and Engineering (IMSE) so that all stakeholders—including students, faculty, industry partners, and prospective applicants—can easily access the most updated information.

This systematic approach guarantees that all stakeholders have clear and timely access to program and course information, fostering academic transparency and alignment with international standards.

2.2 The design of the curriculum is shown to be constructive aligned with achieving the expected learning outcomes.

The curriculum of the Master of Engineering in Acoustics and Multimedia has been designed based on constructive alignment principles, ensuring that teaching, learning, and assessment activities consistently support the achievement of the program's Expected Learning Outcomes (ELOs). The mapping of courses to ELOs, together with assessment strategies, is provided in Tables 1-3 under Criterion 1. This alignment demonstrates that all courses contribute to the development of the competencies expected of graduates, with the thesis serving as the capstone experience that integrates and consolidates knowledge, research skills, and professional competencies.

Table 2.2.1 Requirements for Acceptance

Perspective Students	Requirements
Thai students	Bachelor's degree in Engineering, Science, or related fields ⟶ Application evaluated by Program Committee ⟶ Interview
Thai students (other fields)	Bachelor's degree in other discipline ⟶ Application evaluated by Program Committee ⟶ May require prerequisite courses ⟶ Interview
Foreign students	Bachelor's degree in relevant field ⟶ Application evaluated by Program Committee ⟶ Phone or online interview (if necessary)

Table 2.2.2 Plan A1 – Thesis only

Year	Semester	Course Code	Course Title	Credits (L–P–S)
1	1	19018801	Thesis	9 (0–27–0)
		19018701	Seminar 1 (Non-credit)	1 (0–3–0)
		Total		**9**
1	2	19018801	Thesis	9 (0–27–0)
		19018702	Seminar 2 (Non-credit)	1 (0–3–0)
		Total		**9**
2	1	19018801	Thesis	9 (0–27–0)
		19018703	Seminar 3 (Non-credit)	1 (0–3–0)
		Total		**9**
2	2	19018801	Thesis	9 (0–27–0)
		19018704	Seminar 4 (Non-credit)	1 (0–3–0)
		Total		**9**
Overall				**36**

Table 2.2.2 Plan A2

Year	Semester	Course Code	Course Title	Credits (L-P-S)
1	1	19018101	Advanced Signal Processing	3 (3–0–6)
		19018102	Advanced Topics on Sound and Vibration	3 (3–0–6)
		Total		**6**
1	2	190182xx	Elective 1	3 (3–0–6)
		190182xx	Elective 2	3 (3–0–6)
		19018701	Seminar 1 (Non-credit)	1 (0–3–0)
		Total		**6**
2	1	19018901	Thesis	12 (0–36–0)
		19018702	Seminar 2 (Non-credit)	1 (0–3–0)
		Total		**12**
2	2	19018901	Thesis	12 (0–36–0)
		19018703	Seminar 3 (Non-credit)	1 (0–3–0)
		Total		**12**
Overall				**36**

2.3. The design of the curriculum is shown to include feedback from stakeholders, especially external stakeholders

The design of the Master of Engineering in Acoustics and Multimedia curriculum is carried out through active engagement with both internal and external stakeholders. Internally, feedback is collected from faculty members, current undergraduate students, and alumni through course evaluations, seminars, and yearly academic retreats.

Externally, input is sought from industry partners in the fields of acoustics, audio engineering, creative media technology, and related industries, as well as from professional associations and employers of our graduates. These stakeholders are regularly invited to provide comments through meetings, surveys, and collaborative projects.

The program committee systematically reviews this feedback and incorporates it into curriculum.

Table 2.3.1 Method to Obtain Stakeholder Feedback

Stakeholder Group	Method to Obtain Feedback	Frequency / Timing
Employers / Industry	Surveys, structured interviews, and consultation meetings with industry partners, Informal/formal onsite-online meeting via Cooperation Study, Overseas Training.	Every 2–3 years, before curriculum revision
Alumni	Alumni tracer studies, online questionnaires, focus group discussions	Every 2 years
Faculty	Monthly acadamic committee meetings, annual outing, informal peer discussion	Every semester and yearly program review
Current Students	Course and teaching evaluations, student–lecturer meetings, town hall feedback sessions	Every semester

2.4 The contribution made by each course in achieving the expected learning outcomes is shown to be clear.

The program demonstrates a coherent alignment between its curriculum structure, teaching strategies, and assessment methods with the Expected Learning Outcomes (ELOs). As illustrated in Table 2.4.1, every course contributes to the development of graduate competencies across the eight ELOs with varying emphasis. Foundation courses such as *19018101 Advanced Signal Processing* and *19018102 Advanced Topics on Sound & Vibration* emphasize theoretical knowledge

(ELO2) and quantitative skills (ELO3, ELO5). Practical-oriented courses, including *19018201 Advanced Recording & Mixing* and *19018202 Advanced Measurement Techniques*, focus on experiential learning and collaborative tasks, thus reinforcing problem-solving abilities (ELO3) and interpersonal skills (ELO7).

Specialized courses such as *19018203 Human Perception of Sound*, *19018204 Musical Acoustics*, and *19018205 Acoustic Visualization Technology* provide deeper interdisciplinary knowledge and enhance students' ability to communicate and apply IT-based tools (ELO5, ELO6). Application-based courses like *19018206 Noise Control* and *19018207 Building Technology* extend this knowledge to real-world contexts, emphasizing research-informed solutions and societal responsibility (ELO3, ELO4, ELO8).

Seminars (*19018701–19018704*) are strategically integrated across semesters to cultivate research ethics, communication, leadership, and lifelong learning skills, directly supporting ELOs 1, 4, 6, 7, and 8. Finally, the Thesis (*19018801/19018901*) serves as the capstone experience, ensuring students synthesize advanced knowledge, research capability, ethics, and communication skills, thereby achieving all eight ELOs comprehensively.

In addition, Table 2.4.2 demonstrates that the program employs a variety of teaching and assessment strategies aligned with each ELO. Ethics and professional integrity (ELO1) are fostered through seminars, case studies, and are evaluated via thesis ethics compliance. Advanced knowledge and cognitive skills (ELO2, ELO3) are developed through lectures, problem-based learning, and lab activities, and assessed by exams, lab reports, and project presentations. Research and innovation (ELO4) are promoted through independent thesis work, seminars, and assessed by proposal defense, thesis evaluation, and conference presentation.

Numerical and IT skills (ELO5) are strengthened via computational labs and data analysis assignments, while communication skills (ELO6) are embedded in seminars, presentations, and thesis writing. Interpersonal and leadership competencies (ELO7) are fostered through group projects and seminar leadership roles, assessed by peer evaluation and collaborative project outcomes. Finally, social responsibility and lifelong learning (ELO8) are cultivated through reflective assignments, community-oriented research, and professional engagement, assessed by essays, supervisor evaluations, and academic portfolios.

Overall, the integration of course contributions (Table 2.4.1) with teaching and assessment strategies (Table 2.4.2) ensures that the program provides a balanced, coherent, and outcome-based

curriculum. This alignment guarantees that graduates achieve the intended competencies at the master's level in accordance with national qualifications and international standards.

Table 2.4.1 Contribution of Courses to Expected Learning Outcomes

Course Code – Course Title	ELO1 Ethics & Integrity	ELO2 Knowledge	ELO3 Problem-Solving	ELO4 Research & Innovation	ELO5 Numerical/IT	ELO6 Communication	ELO7 Leadership & Teamwork	ELO8 Social Responsibility & Lifelong Learning
19018101 Advanced Signal Processing	✓	✓	✓	–	✓	–	–	–
19018102 Advanced Topics on Sound & Vibration	–	✓	✓	✓	✓	–	–	–
19018201 Advanced Recording & Mixing	–	✓	✓	–	–	–	✓	–
19018202 Advanced Measurement Techniques	–	✓	✓	–	✓	–	–	–
19018203 Human Perception of Sound	–	✓	–	–	–	✓	–	–
19018204 Musical Acoustics	–	✓	–	–	–	✓	–	–

19018205 Acoustic Visualization Technology	–	–	✓	–	✓	✓	–	–
19018206 Noise Control	–	✓	✓	–	–	–	–	–
19018207 Building Technology	–	✓	✓	✓	–	–	–	–
19018701 – 19018704 Seminars	✓	✓	✓	✓	✓	✓	✓	✓
19018801 / 19018901 Thesis	✓	✓	✓	✓	✓	✓	✓	✓

Table 2.4.2 Learning and Assessment Strategies for Program Learning Outcomes Evaluation

Program Learning Outcomes (PLOs)	Learning Strategies	Assessment Strategies
PLO 1: Knowledge in Acoustics and Multimedia Technology(1.1–1.3)	- Lectures and seminars by faculty and industry experts - Laboratory sessions and studio practice - Guided self-study and literature review	- Written exams (mid/final) - Lab reports and project assignments - Oral questioning and quizzes
PLO 2: Problem Analysis and Application (2.1–2.3)	- Problem-based learning (PBL) - Case studies and simulations - Research-based learning with real-world projects	- Research proposal defense - Project-based assessment - Evaluation of problem-solving exercises
PLO 3: Research Design and Methodology (3.1–3.4)	- Research methodology courses - Independent and supervised research -	- Thesis progress reports - Data analysis assignments - Research paper writing and evaluation

	Use of statistical and IT tools in data analysis	
PLO 4: Communication and Presentation (4.1–4.2)	- Academic writing workshops - Oral presentation practice - Conference participation (domestic/international)	- Thesis defense (oral) - Evaluation of conference/seminar presentations - Publication in proceedings/journals
PLO 5: Ethics and Professional Responsibility (5.1–5.3)	- Research ethics seminars - Case discussions on academic integrity - Role-modeling and mentoring by supervisors	- Supervisor evaluation of conduct - Compliance with research ethics protocols - Peer and self-assessment
PLO 6: Leadership, Teamwork, and Responsibility (6.1–6.3)	- Group projects and collaborative research - Peer learning and discussion sessions - Participation in academic/industry activities	- Peer assessment of teamwork - Supervisor evaluation in group projects - Reflection reports on roles and responsibilities

2.5 The curriculum made by each course are logically structured, properly sequenced (progression from basic to intermediate to specialized courses) and are integrated.

The program curriculum is designed to ensure a logical structure and clear progression from foundational to advanced levels, with strong horizontal and vertical integration across courses.

Our Master of Science Program in Acoustics and Multimedia Technology is a credit-based system. To graduate, a student must complete all required blocks of knowledge and skills, which are systematically structured with coherent numbers of credits and adequate courses. After completing all requirements, students are expected to have acquired a strong foundation of knowledge in acoustics, audio engineering, and multimedia technology, both in breadth and depth. The curriculum encompasses 36 credits in total for the M.Eng. program.

Total credits required: at least 36 credits

Core courses: 12 credits

Elective courses: at least 12 credits

Thesis: 12 credits

At the foundation stage, courses such as *19018101 Advanced Signal Processing* and *19018102 Advanced Topics on Sound & Vibration* provide students with a solid grounding in theoretical frameworks and analytical tools. These courses build essential knowledge and quantitative skills (ELO2, ELO3, ELO5) that form the basis for more advanced learning.

At the intermediate and applied level, courses including *19018201 Advanced Recording & Mixing*, *19018202 Advanced Measurement Techniques*, *19018203 Human Perception of Sound*, and *19018204 Musical Acoustics* translate theory into practice. They emphasize problem-solving, IT applications, and teamwork through hands-on projects and collaborative learning (ELO3, ELO5, ELO7).

At the specialized stage, courses such as *19018205 Acoustic Visualization Technology*, *19018206 Noise Control*, and *19018207 Building Technology* focus on research-based and context-specific applications. These courses connect advanced acoustics knowledge to societal needs, preparing graduates for both professional practice and academic research (ELO4, ELO8).

Seminars (19018701–19018704) are integrated throughout the curriculum to provide continuity and reinforcement of research, communication, ethics, and leadership skills (ELO1, ELO6, ELO7, ELO8).

Finally, the Thesis (19018801 / 19018901) serves as the capstone experience, integrating knowledge, research methodology, and ethical responsibility. Students conduct independent research and present their findings, demonstrating achievement across all ELOs.

Overall, the curriculum is coherent, outcome-based, and aligned with national qualifications and international standards. Its structured progression and integration ensure that graduates possess the advanced competencies required in acoustics and multimedia technology.

2.6 The curriculum to have option(s) for students to pursue major and/or minor specializations.

The curriculum is a unified program without formal options for major or minor specializations. All students are required to complete the same set of core and specialized courses, as well as the thesis, ensuring that graduates consistently achieve the program learning outcomes. While there are no designated specialization tracks, flexibility is provided through elective courses and thesis topics, which allow students to shape their individual academic and research focus in line with their interests and career aspirations. This approach maintains the coherence and integrity of the curriculum while ensuring that all graduates acquire the full spectrum of competencies in acoustics and multimedia technology.

2.7. The program to show that the curriculum is reviewed periodically following an established procedure and that it remains up-to-date and relevant to industry.

The program ensures that the curriculum is periodically reviewed through an established institutional procedure, in line with the regulations of the university and the national higher education

framework. The review process involves multiple stakeholders, including faculty members, students, alumni, and representatives from the acoustics, multimedia, and related industries. Feedback is collected through academic committee meetings, student evaluations, tracer studies, and consultation with industry partners.

Curriculum revision is conducted on a five-year cycle, or earlier if necessary, to ensure alignment with rapid technological advancements and industry demands. Updates to course content, teaching strategies, and learning outcomes are guided by international frameworks such as AUN-QA and Thailand Qualification Framework (TQF), ensuring relevance to both national and global standards.

In addition, continuous input from industry experts and professional associations is integrated into course design, particularly in areas such as audio engineering, noise control, multimedia production, and digital technologies. This process guarantees that graduates are equipped with up-to-date knowledge, practical skills, and professional competencies that match the evolving needs of employers and society.

3. Teaching and Learning Approach

3.1 The educational philosophy is shown to be articulated and communicated to all stakeholders. It is also shown to be reflected in the teaching and learning activities.

The educational philosophy of the program is founded on the integration of science, engineering, and art to foster creativity, innovation, and practical solutions that enhance the quality of life and contribute to society. This philosophy emphasizes learner-centered education, interdisciplinary collaboration, ethical responsibility, and lifelong learning, ensuring that graduates are equipped not only with technical knowledge but also with creativity, leadership, and social responsibility.

This philosophy is articulated and communicated to all stakeholders through multiple channels, including the university's academic handbook, program website, student orientation sessions, course syllabi, and regular faculty meetings. Stakeholder feedback from students, alumni, faculty, and industry representatives is also used to reaffirm and refine the educational philosophy to maintain relevance and clarity.

The philosophy is reflected in teaching and learning activities throughout the program. Courses incorporate active learning, problem-based learning, and project work, which engage students in critical thinking and creative application of knowledge. Laboratory practice, research

seminars, and thesis projects embody the integration of theory with practice and emphasize ethical research conduct. Collaborative projects with peers and industry partners highlight the program's commitment to teamwork, leadership, and social contribution.

Through these approaches, the program ensures that its educational philosophy is not only well-defined and communicated but also fully embedded in the learning experience of every student.

3.2. Teaching and learning activities are shown to allow students to participate responsibly in the learning process.

The program adopts a variety of student-centered teaching and learning activities that encourage students to take responsibility for their own learning. Students are expected to engage actively in the learning process by preparing for classes, participating in discussions, conducting independent research, and collaborating with peers.

Teaching strategies such as problem-based learning and project-based assignments are widely used across courses. These approaches place students in roles where they must explore, analyze, and present solutions to real-world problems in acoustics and multimedia technology. Laboratory sessions and studio work emphasize hands-on practice, where students must plan, execute, and evaluate their own experiments or productions responsibly.

Seminar courses (19018701–19018704) further foster active participation by requiring students to present research findings, critique the work of peers, and engage in scholarly debates. This promotes critical thinking, communication, and accountability. In addition, thesis projects (19018801/19018901) represent the ultimate demonstration of responsible learning, as students must design and conduct independent research, manage their time effectively, and uphold research ethics.

Assessment methods, including presentations, reflective reports, peer and self-assessment, and supervisor feedback, ensure that students are evaluated not only on content knowledge but also on their ability to take responsibility for learning outcomes and professional growth.

Through these approaches, the program ensures that students are not passive recipients of knowledge but active, responsible participants in their own educational journey.

3.3. The teaching and learning activities are shown to involve active learning by the students.

The program emphasizes active learning approaches that engage students in thinking, discussing, investigating, and creating. These methods ensure that students are not passive recipients of knowledge but are actively involved in the construction of their learning experiences. Class discussions are integral to both lecture-based and seminar courses. Instructors use open-ended questions to stimulate dialogue, requiring students to articulate opinions, critique perspectives, and integrate theoretical knowledge into practical contexts. Seminars (19018701–19018704) require students to research, prepare, and present scholarly work. They are also tasked with critiquing peers' work, engaging in academic debate, and reflecting on feedback, thereby enhancing critical thinking and communication skills. Independent research in the thesis (19018801/19018901) is the capstone active learning activity. Students must investigate original problems, design methodologies, and produce new knowledge or innovation, integrating advanced research skills with ethical responsibility. Overall, these activities ensure that students develop not only a deeper mastery of subject content but also essential transferable skills such as critical thinking, problem-solving, communication, teamwork, and leadership.

3.4. The teaching and learning activities are shown to promote learning, learning how to learn, and instilling in students a commitment for life-long learning (e.g., commitment to critical inquiry, information-processing skills, and a willingness to experiment with new ideas and practices).

The program emphasizes learning how to learn as a core philosophy of graduate education. Students are continuously guided to develop independent learning habits and the ability to adapt to new knowledge, technologies, and professional practices. Critical inquiry is cultivated through seminars and research-oriented courses, where students analyze current literature, challenge assumptions, and engage in scholarly discussions. Information-processing skills are strengthened through courses such as Advanced Signal Processing, Advanced Measurement Techniques, and Human Perception of Sound, which require students to synthesize theories, data, and applications into coherent solutions. Innovation and a willingness to experiment are promoted through project-based courses, including Advanced Recording & Mixing, Acoustic Visualization Technology, and Noise Control, where students test creative approaches and refine techniques iteratively. These experiences equip graduates to work effectively with uncertainty and to generate new insights. The thesis serves as the capstone of this learning philosophy, requiring students to design, execute, and present independent

research that contributes to the field. Regular seminar activities ensure continuous exposure to new research directions and professional practices, reinforcing a commitment to lifelong learning and ongoing intellectual development.

3.5. The teaching and learning activities are shown to inculcate in students, new ideas, creative thought, innovation, and an entrepreneurial mindset.

The teaching and learning activities in the program are designed to foster new ideas, creative thinking, and innovation. Through courses such as Advanced Recording & Mixing, Human Perception of Sound, and Musical Acoustics, students are encouraged to explore creative approaches that merge scientific principles with artistic expression. Project-based assignments and laboratory activities allow them to design, experiment, and refine innovative solutions to real-world problems. Specialized courses, including Acoustic Visualization Technology and Noise Control, further enhance this process by requiring students to apply advanced knowledge in developing novel applications and techniques. Seminar courses and the thesis serve as platforms for students to generate and present original research, ensuring continuous cultivation of creativity and innovation throughout the program.

3.6. The teaching and learning processes are shown to be continuously improved to ensure their relevance to the needs of industry and are aligned to the expected learning outcomes.

The teaching and learning processes of the program are continuously improved to ensure their relevance to industry needs and alignment with the expected learning outcomes. Regular feedback is collected from students, alumni, and industry stakeholders to update course content, teaching methods, and assessment practices. Faculty members integrate current industry trends, new technologies, and emerging research into their teaching to maintain currency and relevance. Moreover, program and course reviews are conducted periodically to evaluate the effectiveness of learning activities in achieving the expected learning outcomes, with revisions made as necessary to strengthen the linkage between academic preparation and professional practice.

4. Student Assessment

4.2. A variety of assessment methods are shown to be used and are shown to be constructively aligned to achieving the expected learning outcomes and the teaching and learning objectives.

In this assessment year, only the Seminar courses and Thesis were offered, and therefore the assessment methods focused primarily on advisor-oriented monitoring and rubric-based seminar evaluations. For the Thesis, students did not yet undergo a formal defense; instead, assessment

emphasized weekly meetings with advisors, where students presented their research progress, literature reviews, and early methodological frameworks. These meetings allowed advisors to evaluate students' ethical conduct, theoretical understanding, problem formulation, and early attempts at data analysis, ensuring alignment with ELOs 1–5 and 8.

For the Seminar courses (19018701–19018704), students were required to deliver presentations that highlighted their research development and engagement with academic literature. The seminars were assessed using standardized rubrics focusing on clarity of communication, depth of content, critical engagement with scholarly discussion, and ability to respond to questions from peers and faculty. These activities directly supported ELOs 6 and 7, while also reinforcing lifelong learning and responsibility as students reflected on the broader societal and industrial relevance of their research topics.

As summarized in Table 4.1.1, the current assessment methods ensure that all eight program ELOs are addressed, even at the early stages of thesis and seminar progression. The combination of continuous advisor feedback and structured seminar evaluations guarantees constructive alignment between assessment methods, teaching and learning objectives, and the program's expected learning outcomes.

Beyond this particular year, the program maintains a comprehensive and well-structured assessment system for all courses. **Core courses** such as Advanced Signal Processing and Advanced Topics on Sound & Vibration typically use written examinations, assignments, and project reports to evaluate theoretical knowledge, analytical ability, and quantitative skills (ELO2, ELO3, ELO5). **Elective courses** including Advanced Measurement Techniques, Human Perception of Sound, Musical Acoustics, and Noise Control use laboratory reports, case studies, design projects, and oral presentations to assess students' practical skills, problem-solving, and creativity (ELO2–ELO6).

Table 4.1.1 Alignment of ELOs with Assessment Methods

ELOs	Assessment Methods	Description / Evidence
ELO 1 – Ethics and Integrity	Weekly advisor meetings; Research progress reports	Advisors monitor students' conduct in research planning, data collection, and adherence to ethical guidelines.
ELO 2 – Knowledge and Understanding	Thesis progress evaluation; Seminar presentations	Students demonstrate theoretical understanding through literature reviews and conceptual

		frameworks presented in progress meetings and seminars.
ELO 3 – Cognitive and Practical Application	Advisor feedback on research design; Seminar Q&A	Critical thinking and problem-solving skills assessed through research design discussions and ability to respond to academic questions.
ELO 4 – Research and Innovation Skills	Thesis proposal development; Progress presentations	Students are evaluated on originality and the ability to refine and frame research problems into viable studies.
ELO 5 – Numerical and IT Skills	Draft thesis analysis sections; Advisor review	Use of quantitative methods and IT tools assessed in early data analysis or simulation stages under advisor supervision.
ELO 6 – Communication Skills	Seminar presentations (rubric-based)	Evaluation based on clarity of oral communication, academic writing drafts, and presentation skills using standardized rubrics.
ELO 7 – Interpersonal Skills and Leadership	Group seminar discussions; Advisor feedback	Peer interaction, leadership in discussion, and ability to contribute to academic dialogue are assessed during seminars.
ELO 8 – Social Responsibility and Lifelong Learning	Research topic relevance; Seminar reflection	Progress topics assessed on their relevance to societal or industrial needs, and students' commitment to continued inquiry.

4.2. The assessments and assessment-appeal policies are shown to be explicit, communicated to students and applied consistently.

The program ensures that assessment and assessment-appeal policies are explicit, transparent, and consistently applied. At the beginning of each course, students are informed of the assessment criteria, rubrics, and weighting through the course syllabus and orientation sessions. For seminars, standardized rubrics for presentations are provided in advance so that students understand the expectations regarding content, delivery, and academic integrity. For the thesis, advisors and students agree on milestones, and progress is recorded through regular meetings and written documentation. This transparency allows students to clearly understand how their work will be evaluated and to take responsibility for their learning outcomes.

The institute also provides clear and structured channels for appeal. Students may first discuss concerns with their course instructors or thesis advisors. If not resolved, cases can be escalated to the Program Committee and further to the Faculty/Institute Graduate Committee,

following KMITL's official regulations. These policies are communicated to students in the program handbook and through orientation, ensuring awareness from the outset. Consistent application is maintained by using standardized rubrics, formal reporting systems, and faculty oversight. This guarantees fairness, reliability, and alignment with institutional policies and international best practices.

4.3. The assessment standard procedures for student progression and degree completion, are shown to be explicit, communicated to students, and applied consistently.

The assessment procedures for student progression and degree completion are explicit, communicated, and consistently applied. Although the program maintains official documentation through the program handbook and KMITL Graduate School regulations, the small number of students in this program allows requirements to be conveyed directly through their academic advisors. Advisors play a critical role in guiding students, ensuring that they fully understand the expectations and milestones for progression.

For Plan 1 (Thesis only, 36 credits), students devote their studies entirely to research and seminars. Degree completion requires the successful thesis defense and publication of at least one research article in a respected database-indexed journal (e.g., Scopus or equivalent). Advisors closely monitor students' research development, guide them in manuscript preparation, and ensure that publication standards are met.

For Plan 2 (Coursework and Thesis, 36 credits), students are required to complete coursework in addition to the thesis. Degree completion requires presentation of their work at a national or international conference, with publication of the research as a full paper in the proceedings. Advisors ensure that students are aware of conference opportunities and assist in preparing and submitting work for dissemination. However, we do not have a student in this plan.

In both plans, students must sequentially complete all seminar courses (Seminar 1–4), which serve as checkpoints for monitoring research progress and communication skills. Advisors ensure that students are aware of these requirements, provide formative feedback, and confirm readiness before progression to the next stage.

By combining official documentation with direct advisor communication, the program ensures that students clearly understand the requirements for progression and degree completion. This system provides personalized guidance while maintaining compliance with institutional policies and academic standards.

4.4. The assessments methods are shown to include rubrics, marking schemes, timelines, and regulations, and these are shown to ensure validity, reliability, and fairness in assessment.

The program ensures that its assessment methods are explicit, fair, and consistently applied through the use of rubrics, marking schemes, timelines, and institutional regulations. For Seminar courses (19018701–19018704), students are assessed using standardized rubrics that are shared in advance. These rubrics cover content organization, clarity of delivery, depth of academic analysis, and response to discussion, thereby ensuring transparency, validity, and reliability of evaluation.

For the Thesis (19018801 / 19018901), formative evaluation is conducted primarily by the thesis advisor, who monitors student progress through regular meetings and provides feedback on literature review, methodology, data collection, and preliminary analysis. Because of the small number of students, this advisor-centered approach allows for close and personalized supervision. To ensure fairness and program-wide consistency, the Program Director provides oversight, verifying that advisor assessments conform to program expectations and institutional standards.

The final thesis assessment, including submission and defense, follows the official regulations of KMITL. A committee of examiners evaluates the thesis using institutional marking schemes to guarantee impartiality, fairness, and alignment with academic standards. This layered approach—advisor monitoring, Program Director oversight, and final committee evaluation—ensures that all assessments remain valid, reliable, and aligned with the program's expected learning outcomes.

4.5. The assessment methods are shown to measure the achievement of the expected learning outcomes of the program and its courses.

The program ensures that assessment methods at both the course and program levels are explicitly aligned to the Expected Learning Outcomes (ELOs). Each course has its Course Learning Outcomes (CLOs), which are mapped to the program ELOs, ensuring constructive alignment between teaching, learning, and assessment (see Table 2.4.1).

For course-level assessment, written exams, practical assignments, laboratory reports, seminar presentations, and project-based evaluations are designed to directly measure knowledge, analytical thinking, communication, and teamwork skills. Standardized rubrics and marking schemes further ensure that the evaluations measure the intended CLOs.

For seminars (19018701–19018704), assessment rubrics measure student achievement in communication, leadership, research discussion, and ethical responsibility, aligning with ELOs 1, 4, 6, 7, and 8. For the thesis (19018801/19018901), advisor monitoring, progress reviews, and final defense evaluations measure the full spectrum of ELOs, including research skills (ELO4), ethics (ELO1), IT and numerical skills (ELO5), and communication (ELO6).

At the program level, the integration of course assessments ensures that all PLOs are covered and evaluated systematically. As shown in Table 2.4.2, multiple assessment strategies (exams, reports, rubrics, thesis evaluation) collectively ensure that graduates achieve the program expected outcomes.

This alignment guarantees that assessment methods not only determine student progression but also serve as valid measures of competency development in line with the program's mission and the vision of KMITL and IMSE.

4.6. Feedback of student assessment is shown to be provided in a timely manner.4.6 Feedback of student assessment is shown to be provided in a timely manner.

The program ensures that students receive timely and constructive feedback on all assessments, enabling them to improve their learning and research progress. Because of the small number of students enrolled in the program, the feedback process is highly personalized and advisor-oriented, allowing for continuous monitoring and immediate responses to student needs.

For coursework and laboratory-based assignments, lecturers provide direct feedback through marked reports, presentations, and in-class discussions. Students are informed of their performance against the assessment rubrics, and suggestions for improvement are given within the same week after submission or presentation.

For seminars (19018701–19018704), oral and written feedback is provided immediately following each presentation. Students receive comments from both faculty members and peers, covering content quality, communication style, and research progress. This immediate feedback cycle allows students to refine their work for subsequent seminars.

For the thesis (19018801/19018901), feedback is given continuously during weekly advisor meetings, where students present progress and discuss issues related to methodology, analysis, and academic writing. Advisors ensure that feedback is specific, actionable, and oriented toward meeting the final requirements of thesis submission and defense. Oversight by the Program Director further ensures consistency and fairness in the feedback process.

This system of continuous, multi-level feedback ensures that students can take corrective action promptly, thereby supporting progressive achievement of the program's Expected Learning Outcomes (ELOs).

This system of continuous, multi-level feedback ensures that students can take corrective action promptly, thereby supporting progressive achievement of the program's Expected Learning Outcomes (ELOs).

4.7. The student assessment and its processes are shown to be continuously reviewed and improved to ensure their relevance to the needs of industry and alignment to the expected learning outcomes.

The program demonstrates continuous review and improvement of its student assessment processes to ensure alignment with the Expected Learning Outcomes (ELOs) and overall program objectives. Although not directly linked to industry partners at this stage, the review mechanisms are internally embedded and systematically applied.

Feedback from students is collected through seminar sessions, course evaluations, and informal meetings, which provide valuable input on the clarity, fairness, and timeliness of assessment methods. Lecturers also hold periodic meetings to discuss course-level assessments, including the effectiveness of rubrics, marking consistency, and the appropriateness of workload relative to intended outcomes.

The Program Director, in coordination with the program committee, monitors the consistency of assessment practices across courses and ensures that advisor-based thesis assessments follow institutional standards. Rubrics and marking schemes are revised when necessary to improve validity and reliability.

Furthermore, program-level reviews are conducted as part of the periodic curriculum evaluation (every 5 years) and during annual self-assessment reports (SAR). These mechanisms guarantee that assessment processes remain transparent, fair, and aligned with the program's mission and ELOs, while also maintaining relevance to academic standards and expectations for graduate education.

5. Academic Staff

5.1 The program to show that academic staff planning (including succession, promotion, re-deployment, termination, and retirement plans) is carried out to ensure that the quality and quantity of the academic staff fulfil the needs for education, research, and service.

The Institute of Music, Science, and Engineering (IMSE) ensures that academic staff planning is carried out systematically to guarantee that both the quality and quantity of the staff meet the program's needs in education, research, and service. As shown in Table 5.1, the program currently has a total of 23 academic staff members, equivalent to 15.194 FTEs, comprising one associate professor, four assistant professors, four lecturers, and several part-time and special lecturers.

The program maintains a strong foundation of doctoral-qualified staff (approximately 30%) who provide leadership in research and curriculum development, while lecturers and part-time/specialized instructors contribute professional and industry expertise that enriches the teaching and learning experience. This balance ensures students gain both academic rigor and practical relevance.

To secure long-term sustainability, the institute monitors staff profiles by academic rank, qualifications, and age distribution. While a number of senior staff provide stability and experience, younger staff members and new recruits are encouraged to engage in professional development and research publications to prepare for future promotion. The additional *age* column in Table 5.1.1 allows the program to track and manage succession planning, ensuring smooth generational transition in academic leadership.

Furthermore, promotion and re-deployment are managed in accordance with KMITL policies, with clear pathways for lecturers to progress to assistant professor and beyond, based on research output and academic service. In cases of staff turnover or retirement, IMSE has established links with industry experts and international partners to supplement teaching needs with special lecturers, ensuring continuity and relevance of expertise.

Overall, staff planning at IMSE reflects a balance between stability and renewal, aligning with the program's educational philosophy, expected learning outcomes, and the future needs of industry and academia.

Table 5.1.1 Academic Staff and Full-Time Equivalent (FTE) – Academic Year 2567

Category	Male	Female	Total (Persons)	FTE	Staff with Doctoral Degree (No./%)	Staff without Doctoral Degree (No./%)
Professor	–	–	–	–	–	–
Associate Professor	1	–	1	1	1 (100%)	–
Assistant Professor	3	1	4	4	3 (75%)	1 (25%)
Lecturer	4	–	4	4	–	4 (100%)
Part-Time Lecturer	–	3	3	3	–	3 (100%)
Special Lecturer	9	2	11	3.194	–	7 (100%)*
Total	**17**	**6**	**23**	**15.194**	**4**	**15**

5.2. The program to show that staff workload is measured and monitored to improve the quality of education, research, and service.

In Academic Year 2024 the Master of Science in Acoustics and Multimedia Technology enrolled three students, supported by three full-time academic staff, resulting in a staff-to-student ratio of 1:1. This ratio is significantly more favorable than the OHEC benchmark of 1:15 and demonstrates that the program has ample academic staff resources to ensure close supervision, personalized mentoring, and research guidance. With 192 students across all programs of the institute and 11 academic staff members in total, the institute as a whole already meets the OHEC requirements, and the graduate program benefits further from this supportive academic environment. The exceptionally favorable ratio ensures that students in the master's program receive intensive academic support, allowing high-quality learning and research experiences that exceed national quality standards.

Table 5.2.1 Staff-to-Student Ratio Compared with OHEC Benchmark

Program / Institute	No. of Academic Staff (FTEs)	No. of Students	Staff-to-Student Ratio	OHEC Benchmark	Remarks
M.Sc. in Acoustics and Multimedia Tech.	3	3	1:1.0	1:15	Far more favorable, ensuring close supervision and mentoring.
Institute (All Programs)	11	192	1:17.5	1:20 (UG) / 1:15 (PG)	Meets OHEC benchmark overall; graduate program benefits from surplus staff support.

5.3. The program to show that the competences of the academic staff are determined, evaluated, and communicated.

The competences of the academic staff are determined in accordance with the Thailand Qualifications Framework (TQF) and KMITL's regulations. For the *Master of Engineering in Acoustics and Multimedia Technology*, staff are expected to demonstrate competences in three key areas: (1) teaching and student supervision, (2) research and innovation, and (3) academic services and professional ethics. Recruitment and appointment are based on academic qualifications and expertise relevant to acoustics, multimedia, and engineering, ensuring staff are able to support the program learning outcomes and stakeholder needs.

Evaluation of staff competences is carried out annually through the performance appraisal system of KMITL. This process involves review of teaching responsibilities, supervision of graduate students, research output (such as publications, patents, and creative works), and academic service activities. At the program level, the Program Director and Vice Dean hold regular consultations with faculty members to review progress and performance in relation to teaching quality, student research supervision, and external engagement.

The results of the evaluations are communicated directly to each faculty member through formal appraisal reports and informal consultations. These communications are designed not only to provide feedback but also to guide academic staff in professional development planning. Staff who demonstrate excellence may be nominated for leadership roles or institutional recognition, while staff who need improvement receive support through mentoring, collaborative research opportunities, or training.

Through this system, the program ensures that staff competences are clearly determined, regularly evaluated, and effectively communicated, thereby maintaining the quality of education, research, and service in alignment with the mission of KMITL and IMSE.

Table 5.3.1 Publications of Program committee (2023–2025)

Author	Year	Title	Venue / Type
Munhum Park	2024	Helmholtz resonator coupled with circular membrane	*Applied Acoustics*221:110003 — Journal article
	2023	Validation of a Model on the Coupling Between Circular Membrane and Helmholtz Resonator	*INTER-NOISE 2023*Proceedings
	2023	Numerical study on honeycomb membrane-type acoustic metamaterial…	*INTER-NOISE 2023* Program (Talk)
Kittipitch Meesawat	2025	Development and Preliminary Evaluation of a Wireless Acoustic Sensor Network for Environmental Noise Monitoring	*ICEAST 2025* — Conference paper
	2025	The Trapezoidal Khim: Sound Radiation of G Notes	*ICEAST 2025* — Conference paper
	2023	The Effect of Size, Shape, and Position of Water on Capacitance by Finite Element Simulation using COMSOL Multiphysics (co-author with S. Danworaphong)	*Burapha Science Journal* — Journal article
Sorasak Danworaphong	2024	Phase Speed Inversion for Shallow Water Bathymetry Mapping	*IEEE Journal of Oceanic Engineering* — Journal article
	2024	Online physics laboratory course: United Kingdom Professional Standards Framework perspective from Walailak University, Thailand	*Distance Education* 45(1), 122–140 — Journal article
	2023	Designing of ultrasonic reactor using machine learning	*INTER-NOISE 2023*Proceedings
	2023	Designing of two-dimensional acoustic beamforming array using machine learning	*INTER-NOISE 2023*Proceedings
	2023	The Effect of Size, Shape, and Position of Water on Capacitance by Finite Element Simulation using COMSOL Multiphysics (with K. Meesawat)	*Burapha Science Journal*, 588–604 — Journal article

Table 5.3.2 Publications of IMSE Academic Staff (2023–2025)

Author	Year	Title & Publication Venue	Co-authors
Pitak Thumwarin	2020	Acoustical analysis of the Thai duct flute, Khlui. Proceedings - 2020 6th International Conference on Engineering, Applied Sciences and Technology (ICEAST 2020).	Nachanant Chitanont, Padcharawan Padthong, Bhumrape Sinpru, Nutwarot Sriseang, Tomonori Kato
Phonlasit Thinnakorn na Ayuthaya	2020	Experimental study on comparison sound quality measurement of Thai fiddle resonator. Proceedings - 2020 6th International Conference on Engineering, Applied Sciences and Technology (ICEAST 2020).	-
Sorasak Danworaphong	2024	Phase Speed Inversion for Shallow Water Bathymetry Mapping. IEEE Journal of Oceanic Engineering, 49(4), pp. 1289–1300.	Worakrit Thida, Roberto Li Voti
	2024	Online physics laboratory course: United Kingdom Professional Standards Framework perspective from Walailak University, Thailand. Distance Education, 45(1), pp. 122-140.	Punsiri Dam-O, Yaowarat Sirisathitkul, Thammarong Eadkhong, Suthon Srivaro, Chitnarong Sirisathitkul
	2023	Designing of ultrasonic reactor using machine learning. INTER-NOISE and NOISE-CON Congress and Conference Proceedings, 268(6), pp. 2605-2614.	Kamin Kanchanapradit, Worakrit Thida
Mun Hum Park	2026	Singing in virtual environments: Exploring vocal adaptations to congruent audiovisual scenes of performance venues. Applied Acoustics, 241, 110974.	Kajornsak Kittimathaveenan
	2025	Head-related transfer function for the measurements of otoacoustic emissions evoked by localized sound sources. Journal of Physics: Conference Series.	Ekkanat Prawanta, Yuttana Roongthumskul
	2024	Helmholtz resonator coupled with circular membrane. Applied Acoustics, 221, 110003.	Kajornpop Toboonchuay, Pairoj Rattanangkul
	2024	Exploring the effects of room acoustics on soprano singers' vocal performance in three	Kajornsak Kittimathaveenan

		virtual venues. Proceedings of Audio Engineering Society 156th Convention.	
	2023	Validation of a model on the coupling between circular membrane and Helmholtz resonator. Proceedings of the 52nd International Congress and Exposition on Noise Control Engineering, pp. 3843–3850.	-
	2021	The influence of stage acoustics on the singers' performance and perception: A pilot study. Audio Engineering Society Convention 151.	Kajornsak Kittimathaveenan
	2020	Oral-binaural room impulse responses measured on singers in various halls. Proceedings of the 49th International Congress and Exposition on Noise Control Engineering, pp. 4163–4169.	-
	2020	The presence of Helmholtz resonance modulates the modes of circular membrane. 2020 International Congress on Noise Control Engineering (INTER-NOISE 2020).	Kajornpop Toboonchuay
Nachanant Chitanont	2024	Lombard speech in noise and reverberation between Thai and English. 2024 10th International Conference on Engineering, Applied Sciences, and Technology (ICEAST), pp. 77–80.	Channakan Chaisittirerkkul, Nao Hodoshima
	2021	Deep Neural Networks for Sound Synthesis of Thai Duct F1ute, Khlui. IEEE, pp. 63-67.	Tantep Sinjankhom, Sorawat Chivapreecha, Tomonori Kato
	2020	Noise reduction by spatio-temporal filtering on parallel phase-shifting interferometry. IEEE, pp. 1-4.	Pannarong Thongtangsai, Dabasvee Tachatanachai, Praewa Chatsuksiridech, Fumihiko Imaeda, Risako Tanigawa, Kohei Yatabe, Yasuhiro Oikawa
	2020	Acoustical Analysis of the Thai Duct Flute, Khlui. 2020 6th International Conference on Engineering, Applied Sciences and Technology (ICEAST), pp. 1-4.	Padcharawan Padthong, Bhumrape Sinpru, Nutwarot Sriseang, Pitak Thumwarin

Kittipitch Meesawat	2023	The Study of the Effect of Size, Shape, and Position of Water on Capacitance by Finite Element Simulation using COMSOL Multiphysics. Burapha Science Journal, Vol. 28, No. 1, pp. 588-604.	Sutharat Rattana, Thammarong Eadkhong, Sorasak Danworaphong
	2022	Effect of intermittency factor on singlet oxygen and PGE2 formation in azulene-mediated photodynamic therapy: A preliminary study. Biochemistry and Biophysics Reports, Vol. 31, 101290.	Teerasak Damrongrungruang, Sujaree Phiphitaporn, Nuttakul Salacheep, Chonlada Sritragool, Aroon Teerakapong, Anan Kruesubthaworn, Chaiyapong Ruangsuwan, Wilawan Weera-Archakul
	2021	A Semi-automatic Adjustable Laser Energy Projector for Cell Culture Trays. Petty Patent No. 18233.	Teerasak Damrongrungruang, Sujaree Phiphitaporn, Nuttakul Salacheep, Chonlada Sritragool, Supakrit Timuangsai, Anan Kruesubthaworn, Chaiyapong Ruangsuwan
Matthias Jung	2025	Sound Balls: Revisiting Handheld Spherical Interfaces for Participatory Music (Demo). Proceedings of Audio Mostly & ICAD Joint Conference (AM.ICAD 2025).	-
	2024	Hacking the Concert Experience: Exploring Co-creative Audience Interaction at a Chiptune Live Performance. Innovation in Music: Performance, Production, Technology, and Business, Routledge.	V. Kummen
	2023	Beyond Mutation: How can we Acknowledge Symbiogenesis in Evolutionary Music Coding? The International Conference on AI and Musical Creativity.	-
	2023	Hack the Show: Design and Analysis of Three Interaction Modes for Audience Participation. Journal of the Audio Engineering Society (Special Issue).	I. Clester

	2023	Intelligent Performance Systems: Towards a Design Framework. Studia Musicologica Norvegica.	-
Natcha Techaaphonchai	2025	Music activities for children under 3 years old to enhance executive function: A systematic review on working memory development. Asia-Pacific Symposium for Music Education Research.	Sakrapee Raktaprajit
	2022	Integration of Music in Teaching English for Early Childhood Using a Routine-Based Classroom Management Model. Journal of Research and Development Institute, Bansomdejchaopraya Rajabhat University, 7(2), pp. 214-223.	-
	2021	Music Activity Models for Children from Birth to 3 Years Old in Bangkok that Affect Brain Development in Memory. Proceedings of the National Graduate Research Conference on Integrated Music and Innovative Arts, Princess Galyani Vadhana Institute of Music, pp. 8-34.	Sakrapee Raktaprajit

5.4. The program to show that the duties allocated to the academic staff are appropriate to qualifications, experience, and aptitude.

The allocation of duties in the Master of Engineering in Acoustics and Multimedia Technology program is carefully matched to the qualifications, academic background, research expertise, and professional aptitude of each faculty member. Staff with doctoral training and extensive research in acoustics, signal processing, and vibration are assigned to teach the program's core technical courses and supervise theses, ensuring that students benefit from instruction directly linked to faculty expertise. Faculty with backgrounds in multimedia, sound recording, and music technology are allocated to applied and elective courses where their professional experience enriches the curriculum.

Seminar courses (19018701–19018704) are collaboratively conducted, allowing staff from different specializations to contribute perspectives, provide academic feedback, and evaluate student presentations. Thesis supervision (19018801 / 19018901) is assigned to academic staff with proven research records and relevant expertise, ensuring that student research aligns with international

standards. Administrative and service duties, such as curriculum development, program quality assurance, and community engagement, are distributed in line with individual experience and leadership capabilities.

This systematic alignment of duties with faculty qualifications and experience ensures that the program maintains high-quality teaching, research supervision, and academic services. It also fosters an environment where faculty members can maximize their strengths, enhancing both student learning and institutional reputation.

Table 5.4.1 Academic Staff Qualifications and Assigned Duties

Academic Staff	Highest Qualification	Area of Expertise	Assigned Duties
Assoc.Prof.Dr.Sorasak Danworaphong	Ph.D. Physics (Brown University, USA)	Acoustics, Non-destructive testing, Physics education	Program Director, Thesis supervision, Seminars, Research in Acoustics
Asst. Prof. Dr. Munhum Park	Ph.D. Sound and Vibration (Univ. of Southampton, UK)	Advanced acoustics, vibration, noise control	Core teaching (19018102), Thesis supervision, Seminars
Asst.Prof.Dr.Kittipitch Meesawat	Ph.D. Electrical Engineering (Aalborg University, Denmark)	Musical acoustics, sound engineering, audio applications	Teaching electives (19018204, 19018206), Thesis supervision
Asst.Prof.Dr.Nachanant Chitanont	Ph.D. Acoustical Engineering (Waseda University, Japan)	Sound field visualization, 3D sound perception	Teaching electives (19018205), Research collaboration, Seminars
Asst.Prof.Phonlasit Thinnakorn na Ayuthaya	M.Sc. Music Technology (Indiana Univ., USA)	Music technology, Thai music	Teaching applied courses (19018201), Academic service, Seminars
Dr. Natcha Techaaphonchai	Ph.D. Music (Mahidol University)	Music & brain, music education	Teaching electives, Student advising, Academic services
Asst.Prof.Kajornsak Kittimathaveenan	M.M. Choral Conducting (Cal State Univ., USA)	Music performance, audio-visual production	Elective teaching, Community engagement
Dr. Matthias Jung	Ph.D. Popular Music Performance (Norway)	Interactive music performance, creative technology	Electives, International collaboration

Lect.Kreangkrai Kusoncharatkul	B.Eng. Electrical Engineering (Kasetsart Univ.)	Sound engineering	Support teaching in recording & mixing, Lab assistance
Special Lecturers (Worawit Pikunthong, Solos Punkabutra)	B.Sc./B.Eng. (Physics, Engineering)	Professional music, audio production	Guest lectures, Professional training workshops

5.5. The program to show that promotion of the academic staff is based on a merit system which accounts for teaching, research, and service.

At King Mongkut's Institute of Technology Ladkrabang (KMITL), the promotion and salary adjustment of academic staff are based on a merit system that emphasizes fairness and accountability. The university employs the DPBP system to evaluate academic staff, ensuring that achievements in teaching, research, and service are the foundation for career progression. Within the Institute of Music, Science, and Engineering (IMSE), academic staff who seek higher academic ranks must compile evidence of their contributions, which is reviewed at the faculty and university levels before submission for national approval.

The application of this system ensures that staff members are recognized and promoted on the basis of their academic performance, research productivity, and service to the community rather than seniority alone. It provides clear incentives for continuous improvement and motivates academic staff to strive for excellence in line with the mission of KMITL and IMSE.

5.6. The program to show that the rights and privileges, benefits, roles and relationships, and accountability of the academic staff, taking into account professional ethics and their academic freedom, are well defined and understood.

At King Mongkut's Institute of Technology Ladkrabang (KMITL), the rights, benefits, roles, and responsibilities of academic staff are well defined in official regulations and communicated transparently through faculty meetings, program handbooks, and administrative announcements. These frameworks safeguard the academic freedom of staff in teaching, research, and publication while ensuring that they act in accordance with professional ethics and institutional values.

The Institute of Music, Science, and Engineering (IMSE) applies the principle of ITA – Integrity, Transparency, and Accountability in staff management. Rights and privileges such as welfare benefits, research support, and professional development are communicated openly, while accountability in teaching, supervision, and service is clearly outlined. Integrity is reinforced by

requiring adherence to academic and research ethics, transparency is maintained by standardized procedures in staff evaluation and promotion, and accountability is ensured through formal reporting and performance review mechanisms.

This approach ensures that all academic staff fully understand both their rights and their responsibilities, while also fostering trust, fairness, and professionalism. By embedding the ITA principle, the program guarantees that academic freedom is balanced with ethical responsibility, supporting the mission of KMITL and IMSE.

5.7. The program to show that the training and developmental needs of the academic staff are systematically identified, and that appropriate training and development activities are implemented to fulfil the identified needs.

At King Mongkut's Institute of Technology Ladkrabang (KMITL), the training and developmental needs of academic staff are systematically identified through annual performance appraisals, consultation with program directors, and faculty-level planning. Each academic staff member prepares an annual self-evaluation and development plan, which is reviewed by their direct supervisors to identify areas for improvement in teaching, research, and service. This process ensures that developmental needs are tailored to individual qualifications, experience, and career aspirations, while remaining aligned with institutional goals.

The Institute of Music, Science, and Engineering (IMSE) provides opportunities for staff development through workshops, training courses, and participation in national and international conferences. Training areas typically include advanced pedagogy, research methodology, digital learning tools, and quality assurance practices. Newly recruited staff are encouraged to join professional development programs such as teaching and learning pedagogy for higher education, while experienced faculty are supported in leadership development and research grant workshops.

In addition, IMSE promotes staff development by supporting attendance at external seminars, training programs offered by professional organizations, and collaborative projects with industry and international partners. These activities not only enhance academic competence but also strengthen connections with stakeholders, ensuring that staff remain up-to-date with current developments in acoustics, multimedia, and higher education practice.

Through this systematic approach, the program ensures that the training and developmental needs of staff are continuously identified, addressed, and monitored, thereby improving teaching

quality, research productivity, and service contributions in line with KMITL's mission and IMSE's objectives.

5.8. The program to show that performance management including reward and recognition is implemented to assess academic staff teaching and research quality.

At King Mongkut's Institute of Technology Ladkrabang (KMITL), performance management of academic staff is systematically carried out through annual evaluations of teaching, research, and academic service. The evaluation framework is aligned with institutional policies and integrates both quantitative indicators, such as number and quality of publications, research grants, and teaching load, and qualitative aspects, such as teaching effectiveness, supervision quality, and contribution to academic service. These evaluations are documented and form the basis for promotion, salary adjustment, and contract renewal.

Within the Institute of Music, Science, and Engineering (IMSE), recognition is given through both formal and informal mechanisms. Formal recognition is provided via merit-based salary increases, promotion opportunities, and eligibility for university-level awards for outstanding teaching or research. Informal recognition includes acknowledgments at faculty meetings, institutional newsletters, and annual events celebrating staff achievements. Staff who publish in high-quality journals, receive patents, or secure competitive grants are especially recognized as role models within the program.

Teaching quality is monitored through student evaluations, peer feedback, and program director reviews, while research quality is assessed through publications in indexed journals, conference presentations, and industry collaboration outputs. Staff who demonstrate excellence in these areas are prioritized for further professional development funding and international collaboration opportunities.

This performance management and recognition system not only ensures accountability but also motivates staff to achieve high standards in teaching and research. By linking assessment to reward and recognition, the program sustains a culture of continuous improvement and excellence, fully aligned with KMITL's mission of innovation, integrity, and contribution to society.

6. Student Quality and Support

6.1. The student intake policy, admission criteria, and admission procedures to the program are shown to be clearly defined, communicated, published, and up-to-date.

The Master of Engineering in Acoustics and Multimedia Technology program at the Institute of Music, Science, and Engineering (IMSE), KMITL, has a clearly defined and transparent intake and admission policy. Students are admitted through a formal interview process conducted by the program committee, which emphasizes not only academic qualifications but also enthusiasm, commitment, and readiness to pursue advanced study in acoustics and multimedia technology.

Applicants holding a bachelor's degree in engineering or other related fields are eligible for direct admission. For applicants from unrelated fields, admission is possible upon evaluation of their background and potential. In such cases, the program may recommend additional coursework or require applicants to audit suggested undergraduate courses before admission is finalized. Performance in these courses, along with the interview, is taken into account to ensure readiness for graduate-level study.

The policy is designed to be flexible yet rigorous, ensuring that all admitted students possess sufficient foundational knowledge and motivation to succeed in the program. Admission information, including criteria and procedures, is regularly updated and communicated through the official IMSE and KMITL websites, as well as during orientation sessions.

This process guarantees that the intake policy is fair, consistent, and aligned with the program's mission to produce competent graduates with advanced knowledge, research capability, and professional responsibility.

Table 6.1.1 Admission Pathways and Requirements

Admission Pathway	Requirements	Additional Conditions
Direct admission (Engineering fields)	Bachelor's degree in Engineering (e.g., Electrical, Mechanical, Audio, or related) + Interview	–
Admission from related fields	Bachelor's degree in related areas (e.g., Multimedia Tech, Applied Physics, ICT) + Interview	May be required to audit prerequisite courses before final admission is processed

Admission from non-related fields	Bachelor's degree in other disciplines + Interview	Must audit suggested prerequisite courses; admission finalized upon satisfactory progress
Foreign students	Bachelor's degree in Engineering or related fields + Interview (online if needed)	Same criteria apply; additional proof of English proficiency may be requested

6.2. Both short-term and long-term planning of academic and non-academic support services are shown to be carried out to ensure sufficiency and quality of support services for teaching, research, and community service.

The Master of Engineering in Acoustics and Multimedia Technology program ensures that academic and non-academic support services are systematically planned in both short-term and long-term frameworks to maintain sufficiency and quality.

In the short term, the program addresses immediate academic needs such as annual calibration of laboratory equipment (e.g., sound level meters, research microphones), renewal of software licenses (e.g., EASE for acoustic simulation, MATLAB for analysis), and upgrades of IT infrastructure to guarantee stable internet connectivity for teaching and research. Non-academic support, including academic advising, health services, and administrative assistance, is delivered directly to students through their advisors and IMSE staff to ensure close monitoring of progress.

In the long term, the institute invests in upgrading facilities such as Dolby Atmos-certified recording studios, advanced multimedia production laboratories, and expanded access to international research databases. Continuous development of staff competences and digital platforms also forms part of long-term planning, ensuring that support services remain aligned with future teaching, research, and industry demands. Non-academic services are enhanced through collaborations with industry partners and KMITL central administration to provide sustainable career guidance, community outreach, and well-being initiatives.

These systematic planning processes confirm that both short-term and long-term needs are addressed, ensuring that academic and non-academic support services effectively contribute to teaching excellence, high-quality research, and impactful community engagement.

Table 6.2.1 Examples of Academic and Non-Academic Support Services (Short-term vs Long-term)

Support Service	Short-term Planning	Long-term Planning
Laboratories & Equipment	Annual calibration of sound level meters, maintenance of microphones and interfaces	Investment in new research-grade instruments and upgraded acoustic labs
IT Infrastructure	Renewal of licenses (EASE, MATLAB, Pro Tools), Wi-Fi maintenance	Expansion of digital platforms, integration of AI-based learning and research tools
Studios (Recording & Multimedia)	Regular equipment checks, system upgrades as needed	Dolby Atmos-certified studio, modernization of multimedia facilities
Library & Digital Resources	Annual updates of books and journal subscriptions	Expansion of international database access (JASA, AES, etc.)
Academic Advising & Seminars	Advisor-student weekly meetings, seminar presentations	Structured advising system, integration of career mentoring and alumni networking
Non-academic Support (Student Life)	Health services, administrative support, counseling	Community outreach programs, long-term well-being and career development initiatives

6.3. An adequate system is shown to exist for student progress, academic performance, and workload monitoring. Student progress, academic performance, and workload are shown to be systematically recorded and monitored. Feedback to students and corrective actions are made where necessary.

The Master of Engineering in Acoustics and Multimedia Technology program implements a systematic framework for monitoring student progress, academic performance, and workload. Due to the small cohort size, student monitoring is highly individualized and advisor-centered. Each student is assigned a thesis advisor at the beginning of the program, and regular weekly or bi-weekly meetings are held to review progress, workload balance, and research development.

Academic performance is formally recorded through seminar presentations (19018701–19018704) and thesis progress reports (19018801/19018901, 19018901). Seminar courses serve as checkpoints where students present their work to faculty and peers, receive structured feedback, and are evaluated using clear rubrics. Thesis milestones, such as proposal defense and research progress presentations, are systematically documented by the advisor and program committee.

Workload monitoring is achieved through close communication between advisors and students, allowing for early identification of academic or personal challenges. Corrective actions, such as workload adjustment, additional advising sessions, or recommendations to audit prerequisite courses, are applied when necessary.

Feedback is provided in a timely and formative manner, both orally during advising sessions and in written comments on seminar and thesis reports. This ensures that students remain on track to meet the expected learning outcomes. The program's monitoring system emphasizes continuous improvement, individualized support, and accountability, ensuring that students can complete their studies effectively and within the required timeframe.

6.4. Co-curricular activities, student competition, and other student support services are shown to be available to improve learning experience and employability.

Although the program does not currently participate in formal student competitions, it actively provides co-curricular activities and support services that enhance student learning and employability. Students are regularly engaged in teaching-related activities, such as assisting lecturers in laboratory sessions and supporting undergraduate instruction. These opportunities allow students to reinforce their knowledge, practice communication skills, and gain mentoring experience.

In addition, students are involved in applied, practice-oriented activities that extend learning beyond the classroom. These include measuring sound levels in public areas, calibrating sound level meters, and demonstrating the use of Head and Torso Simulators (HATs) to both internal users (faculty and students within the institute) and external stakeholders (visitors, industry partners, and community members). These experiences not only strengthen technical competence but also foster professional responsibility and engagement with broader society.

Other student support services are also available, including access to advising, IT and library resources, and institute-level activities that promote community building and well-being. Together, these co-curricular and support mechanisms contribute to the holistic development of students, preparing them for careers in academia, research, and industry, consistent with the program's expected learning outcomes.

6.5 The competences of the support staff rendering student services are shown to be identified for recruitment and deployment. These competences are shown to be evaluated to ensure their continued relevance to stakeholders needs. Roles and relationship are shown to be well-defined to ensure smooth delivery of the services.

The program benefits from a small but effective team of support staff who are responsible for student services, academic coordination, and laboratory support. The required competences of these staff are clearly identified during recruitment, with emphasis on administrative skills, technical knowledge in acoustics and multimedia laboratories, and interpersonal skills to support both students and academic staff.

Roles and responsibilities are explicitly defined through the institute's organizational structure and job descriptions, ensuring clarity in service delivery. Administrative staff manage admissions, student records, and progression monitoring, while technical staff maintain laboratory equipment, support class demonstrations, and assist students in practical training.

Competences of support staff are systematically evaluated through annual performance reviews conducted jointly by the Director of Administrative Staff and the Dean. This review process assesses the effectiveness of staff in carrying out their duties, their responsiveness to student and academic needs, and their ability to support teaching and research. Results are communicated directly to staff, and corrective measures or development plans are introduced as necessary.

Professional development opportunities, including workshops and on-the-job training, are also provided to ensure that staff competences remain relevant to the evolving needs of the program and its stakeholders. This is particularly important in a specialized program such as acoustics and multimedia technology, where staff must stay familiar with new measurement tools, software, and safety standards, especially those in engineering positions.

Overall, the identification of competences, structured evaluation, and clearly defined responsibilities ensure smooth and effective delivery of student services, contributing to a supportive learning environment that aligns with institutional goals and stakeholder expectations.

6.6. Student support services are shown to be subjected to evaluation, benchmarking, and enhancement.

Student support services at the Institute of Music, Science, and Engineering are systematically evaluated to ensure that they meet the needs of students and align with the program's learning outcomes. Services include academic advising, laboratory assistance, access to IT systems, library support, and co-curricular activities.

Evaluation of these services is carried out through multiple mechanisms. Students are regularly invited to provide feedback during seminar courses and through informal meetings with advisors. In addition, the program committee reviews the adequacy and effectiveness of services at

the end of each academic year. These reviews focus on identifying strengths, gaps, and areas for improvement in academic and non-academic support.

Enhancement of student support services is implemented based on evaluation results. Recent improvements include upgrades of studio equipment, yearly calibration of measurement tools, and expansion of digital learning resources. In the coming academic year, the program also plans to strengthen English academic writing support and adopt advanced software tools to better prepare students for thesis work and professional practice. Specifically, the program will purchase a 3-seat license of QuillBot, which will help students improve their academic writing and provide a safeguard against AI-generated content misuse.

Through continuous evaluation and enhancement, the program ensures that student support services remain responsive, competitive, and relevant to both academic requirements and industry needs.

7. Facilities and Infrastructure

7.1. The physical resources to deliver the curriculum. Including equipment, materials and informational technology, are shown to be sufficient.

The Institute of Music, Science, and Engineering (IMSE) provides adequate and well-maintained physical resources to support the delivery of the curriculum. Classrooms are fully equipped with audio-visual facilities, air-conditioning, and flexible seating arrangements suitable for lectures, seminars, and group activities.

Specialised studios are available for sound recording, mixing, and production training, equipped with industry-standard hardware and software. A computer laboratory supports acoustics simulation, audio engineering, and multimedia coursework, providing students with access to licensed software and high-speed internet.

In addition, the Institute provides campus-wide IT infrastructure including Wi-Fi and learning management systems, enabling students to access online resources, conduct research, and support self-directed learning. The university also provide access to the central university library, offers up-to-date references in Thai and English, including textbooks, journals, and online databases.

The Institute also implements annual budget allocations for the procurement, repair, and upgrading of equipment and teaching materials. Preventive maintenance is carried out to ensure that facilities remain in good working order. These measures ensure that physical and digital resources are sufficient to support both teaching and student research activities.

Table 7.1.1 Facilities and Resources Supporting the Curriculum

Facility/Resource	Purpose	Adequacy/Remarks
Classrooms and Graduate Office	Lectures, seminars, group learning	Renovated regularly, sufficient seating and AV support
Studios (Recording & Production)	Practical training in sound recording, mixing, and design	Equipped with updated, industry-standard systems, including a Dolby Atmos certified studio
Computer Laboratory	Acoustics simulation, audio/multimedia coursework	Licensed software (LabView, MATLAB, Adobe suite, SPSS), high-speed internet access, and an iMac computer laboratory
Library (Central University)	Academic references and databases	Updated Thai & English resources with comprehensive online access
IT Infrastructure	Internet, LMS, digital learning	Reliable Wi-Fi and digital platforms supporting blended and online learning
Specialised Equipment	Student research, projects, and practice	Procured as required, including a dedicated keyboard practice room, and maintained regularly

7.2. The laboratories and equipment are shown to be up-to-date, readily available, and effectively deployed.

The Institute of Music, Science, and Engineering provides laboratories and specialised equipment that are up-to-date, regularly calibrated, and effectively deployed in both teaching and research. Major equipment such as Sound Level Meters (Class 1 and Class 2), research-grade microphones, and recording interfaces are systematically maintained with annual calibration schedules to ensure accuracy and reliability. The availability of multiple sets of equipment allows simultaneous class use and individual research access, maximising deployment efficiency.

Table 7.2.1 Laboratories and Equipment Supporting the Program

Laboratory/ Equipment	Description/Use	Adequacy/Deployment	Relevant ELO(s)	How It Supports ELOs
Recording & Production Studios (Dolby Atmos certified)	Studio for professional sound recording, mixing, immersive audio	Updated to industry standards; used in coursework, capstone projects, and faculty research	ELO2, ELO4	Provides hands-on training in advanced recording/mixing techniques aligned with industry practices
Acoustics Laboratory	Equipped with HATs (Head and Torso	Adequate for multiple classes; calibration ensures	ELO1, ELO5	Enables acoustic measurement, data

	Simulator), Sound Level Meters (2 × Class 1, 40 × Class 2), yearly calibration	compliance with international standards		collection, and interpretation for research and coursework
Measurement Equipment	3 research-grade microphones with 2 calibrators; portable SPL meters; lock-in amplifiers; acoustically-treated room	High precision, regularly deployed in experimental coursework and faculty projects	ELO1, ELO5	Supports precision measurement, experimental design, and applied research
Computer Laboratory	iMacs with MATLAB, software Pro Tools, Logic Pro; high-speed internet	Sufficient for acoustics simulation, multimedia projects, and blended learning	ELO2, ELO3	Provides computing power and licensed software for signal processing, acoustics, and IT-based learning
Specialised Interfaces	Multiple audio interfaces, multichannel mixing consoles, research-grade soundcards	Available in abundance; used in practical labs, project studios, and research work	ELO2, ELO4, ELO5	Facilitates hands-on experiments in audio engineering, project integration, and innovation
Multimedia & Visualization Tools	VR/AR systems, digital media production platforms	Deployed in elective and interdisciplinary projects	ELO3, ELO6	Enhances creativity, IT application, and lifelong learning in multimedia contexts

As shown in Table 7.2.1, the program maintains up-to-date laboratories and specialised equipment that are sufficient and effectively deployed to support the curriculum. Each laboratory and equipment resource is directly aligned with the Expected Learning Outcomes (ELOs). For instance, the Dolby Atmos-certified recording studios and specialised interfaces support ELO2 and ELO4 by providing students with industry-standard experience in sound engineering. Similarly, the acoustics laboratory and measurement equipment ensure compliance with professional standards (supporting ELO1 and ELO5), while the computer lab and multimedia tools contribute to IT application, interdisciplinary learning, and life-long learning (ELO3 and ELO6).

7.3. A digital library is shown to be set-up, in keeping with progress in information and communication technology.

The Institute of Music, Science, and Engineering (IMSE) provides students and faculty with access to the KMITL Central Library digital system. The digital library offers extensive online databases, e-journals, e-books, and digital learning resources in both Thai and English, supporting academic coursework, research, and life-long learning. The system is integrated with the university's IT infrastructure, enabling access via remote login and mobile platforms, ensuring that students and staff can retrieve learning resources anytime and anywhere.

The digital library is also continuously updated with new acquisitions and subscriptions to international databases such as Scopus, IEEE Xplore, ScienceDirect, SpringerLink, and ThaiLIS. Additionally, the Learning Management System (LMS) is integrated with the digital library to provide seamless access to reference materials within specific courses.

Through these facilities, the program ensures that students are not limited to physical resources but are able to fully utilise modern ICT to develop self-directed learning skills and enhance their academic and research capabilities, in line with ELO3 (application of IT and digital resources) and ELO6 (life-long learning).

Table 7.3.1 Digital Library Resources

Digital Resource	Description/Access	Adequacy/Deployment	Relevant ELO(s)
KMITL Central Digital Library	Access to online catalogue, e-books, e-journals	Sufficient and continuously updated	ELO3, ELO6
International Databases (Scopus, IEEE Xplore, ScienceDirect, SpringerLink)	Peer-reviewed research resources, academic references	Subscribed annually, accessible via VPN and campus network	ELO1, ELO3, ELO5
ThaiLIS (Thailand Library Integrated System)	National academic resources and theses	Integrated into library search system	ELO1, ELO3
Institutional Repository (KMITL IR)	Access to theses, dissertations, and faculty publications	Open access for students and alumni	ELO5, ELO6
Learning Management System (LMS) Integration	Direct linking of course content to digital references	Enhances blended and online learning	ELO3, ELO6

7.4. The information technology systems are shown to be set up to meet the needs of staff and students

The Institute of Music, Science, and Engineering (IMSE) has established robust information technology (IT) systemsthat meet the academic and administrative needs of both staff and students. These systems provide seamless support for teaching, learning, research, and management.

Students and faculty have access to high-speed Wi-Fi across campus, a dedicated Learning Management System (LMS) for blended and online learning, and licensed software for specialized applications such as EASE, MATLAB, Pro Tools, and Logic Pro. For research and administrative work, faculty are supported with institutional email, cloud storage (Google), and digital platforms that ensure effective communication and collaboration.

Additionally, IT systems are integrated with the university's academic registration, grading, and evaluation system, ensuring transparency and efficiency. Technical support teams are available to assist with troubleshooting, system maintenance, and updates. These infrastructures are designed to align with the program's expected learning outcomes, particularly in developing digital literacy (ELO3), problem-solving (ELO2), and life-long learning skills (ELO6).

Table 7.4.1 Information Technology Systems

IT System/Service	Description/Access	Adequacy/Deployment	Relevant ELO(s)
Campus Wi-Fi Network	High-speed wireless internet across classrooms, studios, and labs	Reliable connectivity, supports e-learning and research	ELO3, ELO6
Learning Management System (LMS)	Digital platform for online lectures, assignments, and assessments	Fully deployed in all courses, accessible 24/7	ELO2, ELO3, ELO6
Licensed Software	EASE (acoustics simulation), MATLAB, Pro Tools, Logic Pro, Adobe Suite	Updated annually, available in labs and via student licenses	ELO2, ELO3
Academic Information System	Online registration, course evaluation, grading system	Transparent and efficient for both staff and students	ELO1, ELO3
Cloud & Email Services	University email, Google Workspace, cloud storage for collaboration	Adequate for communication and project sharing	ELO3, ELO6
IT Support & Maintenance	Dedicated technical team for troubleshooting and updates	Responsive and accessible for staff and students	ELO3, ELO6

7.5. The university is shown to provide a highly accessible computer and network infrastructure that enables the campus community to fully exploit information technology for teaching, research, service, and administration.

The university provides a highly accessible computer and network infrastructure that supports all aspects of teaching, research, service, and administration. The campus is equipped with high-speed internet access (wired and wireless) in classrooms, studios, laboratories, offices, and common areas. This ensures that students and staff can fully utilize digital platforms for blended learning, online resources, and research collaboration.

The computer laboratories are equipped with iMacs and licensed software such as EASE, MATLAB, Pro Tools, Logic Pro, and Adobe Creative Suite, enabling advanced simulation, music production, and multimedia design. The network system is integrated with cloud services, email, and centralized academic information systems, ensuring seamless connectivity for course registration, evaluation, and academic records management.

For research, the infrastructure supports remote access to databases (e.g., Scopus-indexed journals), data sharing, and collaborative platforms. In addition, faculty and students have access to university-wide digital services such as learning management systems (LMS), video conferencing platforms, and cloud-based project management tools.

Regular upgrades, cybersecurity protocols, and 24/7 IT support guarantee that the infrastructure remains reliable, secure, and aligned with the program's learning outcomes, particularly those related to digital literacy, communication, and life-long learning (ELO2, ELO3, ELO6).

In addition to the existing infrastructure, the program is preparing to strengthen digital academic support. In 2026, the university plans to purchase QuillBot, an AI-powered tool for proofreading, grammar checking, and paraphrasing. This system will be used to support students and faculty in academic writing, research publications, and English communication, ensuring higher quality outputs in theses, reports, and international journal submissions.

This initiative reflects the commitment to integrating AI-driven educational technologies to enhance learning outcomes, promote research visibility, and develop communication skills in line with ELO2 (knowledge application), ELO3 (communication and teamwork), and ELO6 (lifelong learning).

Table 7.5.1 Computer and Network Infrastructure

Facility/Service	Description	Adequacy/Deployment	Relevant ELO(s)
Campus Network	High-speed wired and wireless internet across campus	Reliable, accessible in classrooms, studios, labs, and offices	ELO3, ELO6
Computer Laboratories	iMacs with licensed software (EASE, MATLAB, Pro Tools, Logic Pro, Adobe Suite)	Regularly upgraded; supports coursework and research	ELO2, ELO3
Cloud & Collaboration Tools	Google Workspace, cloud storage, project sharing, video conferencing	Facilitates communication, teamwork, and remote learning	ELO3, ELO6
Academic Information System	Centralized registration, grading, evaluation, and academic records	Fully deployed, user-friendly, and transparent	ELO1, ELO3
Digital Library Access	Remote access to Scopus-indexed journals and e-resources	Supports research and academic work anytime, anywhere	ELO2, ELO6
IT Support & Cybersecurity	24/7 technical support, regular system updates, data protection protocols	Ensures reliability, privacy, and continuous access	ELO3, ELO6
AI Writing & Proofreading Tool (2026)	QuillBot: grammar check, AI paraphrasing, and proofreading support for research & academic writing	To be purchased in 2026; will enhance English communication, writing quality, and research publication readiness	ELO2, ELO3, ELO6

7.6. The environmental, health, and safety standards and access for people with special needs are shown to be defined and implemented.

The Institute has a clear environmental policy in line with the university's *Green Campus* initiative, promoting energy conservation, waste management, and eco-friendly practices. Classrooms, studios, and laboratories are maintained to support a safe and sustainable learning environment.

In terms of health and safety, the Institute provides health services for staff and students, including a medical service unit and regular health campaigns. All teaching and laboratory facilities are equipped with fire extinguishers, emergency exits, 24-hour CCTV, and undergo routine safety

inspections. Preventive maintenance is carried out regularly to ensure that classrooms and laboratories remain safe and functional.

To ensure access for people with special needs, the Institute has begun renovations to improve classrooms and facilities, including ramps, escalators and elevators. In addition, digital learning platforms (LMS, digital library) are compatible with assistive technologies, allowing inclusive access for all learners.

Through these initiatives, the Institute demonstrates its commitment to environmental sustainability, health and safety, and inclusivity, ensuring that all stakeholders benefit from a supportive and secure academic environment.

Table 7.6.1 Environmental, Health, Safety, and Accessibility

Area	Policy/Implementation	Adequacy/Remarks
Environmental Management	Institute follows "Green University" initiative; energy-saving campaigns, waste management, and sustainable campus practices	Ongoing projects ensure environmentally friendly facilities and promote sustainability awareness
Health Services	On-campus health services provided for staff and students, including regular check-ups and first-aid readiness	Adequate to support staff and students' well-being; accessible during office hours
Safety Standards	Safety regulations for laboratories and studios (fire extinguishers, emergency exits, annual safety drills)	Regular inspections and compliance with national standards
Accessibility for Special Needs	Renovation of classrooms and facilities to support access for students and staff with special needs (ramps, toilets, signage)	Improvements ongoing; current facilities partially accessible, with future upgrades planned
Learning Environment	Continuous maintenance of classrooms, studios, and laboratories for safe and effective learning	Facilities regularly upgraded and maintained in usable condition

7.7. The university is shown to provide a physical, social, and psychological environment that is conducive for education, research, and personal well-being.

The Institute of Music, Science, and Engineering provides a conducive physical, social, and psychological environmentthat supports education, research, and personal well-being. The physical facilities, such as classrooms, studios, and offices, are maintained to ensure effective teaching and research.

On the social and psychological aspects, the institute promotes a positive work atmosphere through both formal and informal recognition measures. At the faculty and institute levels, policies such as awards for outstanding staff performance, foreign language-use compensation, and annual staff seminars are implemented to build motivation and morale. Additionally, informal initiatives—such as giving gifts during New Year celebrations and organizing social gatherings—further strengthen collegiality and a sense of belonging.

A significant initiative is the yearly Coach–Care–Concern event, where undergraduate and graduate students engage with lecturers in an informal and supportive setting. The event includes gift exchanges, discourse sessions, and collaborative activities, fostering a stronger connection between students and faculty. This initiative helps to cultivate trust, belonging, and mutual respect, which are essential for a holistic educational experience.

While these practices provide tangible support for staff and students, the institute recognizes the need to develop a more systematic framework to enhance consistency and long-term sustainability in fostering well-being.

7.8. The competences of support staff rendering services related to facilities are shown to be identified and evaluated to ensure that their skills remain relevant to stakeholder needs.

The institute ensures that the competences of support staff are clearly defined, systematically evaluated, and continuously developed to remain relevant to the needs of students, lecturers, and external stakeholders. Each staff member is required to prepare an operation manual, which specifies their responsibilities, work procedures, challenges, and solutions. This practice has been in place since 2016 and helps to maintain clarity and consistency in administrative services.

The annual performance evaluation is conducted by a formal committee consisting of the Dean, the Director of Administrative Staff, and Heads of Departments. The evaluation framework covers two main aspects:

1. Work Outcomes – quality, timeliness, efficiency, and resource management.
2. Work Behavior – responsibility, collaboration, and professionalism.

In addition, the institute ensures transparency by updating staff on changes in evaluation criteria or administrative processes, allowing staff to adapt accordingly. Staff are also encouraged to participate in training programs and workshops organized by the university to enhance technical and administrative skills.

Beyond formal evaluation, the institute promotes competence development through informal but impactful practices. For example, the annual staff outing is not only a recreational activity but also a platform for structured dialogues on work allocation, problem-solving, and teamwork. This provides staff with opportunities to exchange experiences, raise concerns, and improve coordination in a supportive environment.

Through these combined measures, the institute strengthens the capacity of its support staff, ensuring that their skills are continuously aligned with institutional goals and stakeholder expectations.

Table 7.8.1 Competence Evaluation and Development of Support Staff

Process/Activity	Purpose/Content	Frequency	Responsible Unit/Committee	Outcome/Improvement
Operation Manual	Defines roles, responsibilities, techniques, problems, and solutions	Continuous	Support staff; reviewed by unit heads	Standardized tasks and clear responsibilities
Annual Performance Evaluation	Assesses quality, timeliness, efficiency, and outcomes of assigned work	Yearly	Evaluation Committee (Dean, Director of Administrative Staff, HoDs)	Improved accountability and performance tracking
Work Behavior Assessment	Evaluates responsibility, collaboration, professionalism	Yearly	Evaluation Committee	Reinforces teamwork and professional conduct
Feedback & Communication	Updates staff on changes in evaluation criteria or management practices	As needed	Institute administration, HR Office (KMITL)	Consistency and transparency across units
Training & Workshops	Skills enhancement in admin/technical areas	Occasionally	Institute & HR Office	Up-to-date competences aligned with stakeholder needs
Annual Staff Outing & Work Dialogue	Builds morale, teamwork, discusses work allocation, problems, and solutions	Yearly	Institute administration	Strengthened teamwork, improved problem-solving, better coordination

7.9. The quality of the facilities (library, laboratory, IT, and student service) is shown to be subjected to evaluation and enhancement.

The institute places strong emphasis on ensuring that facilities such as the library, laboratories, IT systems, and student services are regularly evaluated and continuously enhanced to support teaching, research, and student well-being.

For the library, students and staff have access to the central university library with Thai and English references and online databases, including selected Scopus-indexed journals. Feedback on adequacy and accessibility is collected through annual surveys and student-staff consultations, and the university library regularly updates its digital and physical collections.

For laboratories, equipment such as sound level meters, head and torso simulators (HATs), and research-grade microphones are subject to annual calibration to ensure accuracy and compliance with standards. Laboratory facilities are inspected every semester, and updates or upgrades are made in response to student feedback and evolving academic/industry requirements.

For IT infrastructure, periodic assessments are conducted to monitor system reliability, internet speed, and LMS functionality. The institute has invested in software licenses (e.g., MATLAB, EASE, Pro Tools, Logic Pro) and will expand resources (e.g., QuillBot subscription in 2026) to further support digital learning and research.

For student services, evaluations are embedded in the yearly satisfaction survey, covering areas such as counseling, academic advising, and student activities. Services are enhanced based on survey results and feedback collected during the Coach–Care–Concern annual event, where students and lecturers interact closely.

These systematic evaluations and continuous enhancements ensure that the facilities remain relevant, effective, and supportive of stakeholder needs.

Table 7.9.1 Evaluation and Enhancement of Facilities

Facility/Service	Evaluation Method	Frequency	Enhancement/Improvement Actions
Library (Central & Digital)	Annual student and staff satisfaction survey; feedback via consultations	Yearly	Updated references, expanded online journal access (Scopus)
Laboratories	Equipment calibration, semester inspections, student feedback	Yearly + Each Semester	Upgraded/maintained instruments; acquisition of new research tools
IT Infrastructure	Monitoring internet, LMS, and licensed software performance	Ongoing + Yearly review	System upgrades, new software licenses (EASE, QuillBot planned 2026)
Student Services	Student satisfaction survey, Coach–Care–Concern event feedback	Yearly	Enhanced counseling services, academic advising, and activities

8. Output and Outcomes

8.1 The pass rate, dropout rate, and average time to graduate are shown to be established, monitored, and benchmarked for improvement.

8.2 Employability as well as self-employment, entrepreneurship, and advancement to further studies, are shown to be established, monitored, and benchmarked for improvement.

8.3 Research and creative work output and activities carried out by the academic staff and students, are shown to be established, monitored, and benchmarked for improvement.

8.4 Data are provided to show directly the achievement of the programme outcomes, which are established and monitored.

8.5 Satisfaction level of the various stakeholders are shown to be established, monitored, and benchmarked for improvement.

SELF-ASSESSMENT SUMMARY

Criteria 1 – Checklist

Criterion	Rating	1	2	3	4	5	6	7
1.1 The program shows that the expected learning outcomes are appropriately formulated in accordance with an established learning taxonomy, are aligned to the vision and mission of the university, and are known to all stakeholders.	4				X			
1.2 The program shows that the expected learning outcomes for all courses are appropriately formulated and are aligned to the expected learning outcomes of the program.	4				X			
1.3 The program shows that the expected learning outcomes consist of both generic outcomes and subject-specific outcomes.	4				X			
1.4 The program shows that the requirements of the stakeholders, especially the external stakeholders, are gathered, and that these are reflected in the expected learning outcomes.	4				X			
1.5 The program shows that the expected learning outcomes are achieved by the students by the time they graduate.	4				X			
Overall opinion	4							

Criteria 2 – Program Specification

Criterion	Rating	1	2	3	4	5	6	7
2.1 Program & course specifications comprehensive, up-to-date, communicated	4				X			
2.2 Curriculum constructively aligned with ELOs	4				X			
2.3 Curriculum design includes stakeholder feedback	4				X			
2.4 Contribution of each course to ELOs is clear	4				X			
2.5 Courses are logically structured, sequenced, and integrated	4				X			
2.6 Curriculum has options for specialization								
2.7 Curriculum reviewed periodically, up-to-date & relevant	4				X			
Overall opinion	4							

Criteria 3 – Teaching and Learning Approach

Criterion	Rating	1	2	3	4	5	6	7
3.1 Educational philosophy articulated & reflected in T&L	4				X			
3.2 Students participate responsibly in learning	4				X			
3.3 Active learning involved	4				X			
3.4 Learning promotes life-long learning	4				X			
3.5 Activities inculcate creativity & innovation	4				X			
3.6 T&L continuously improved for relevance & ELO alignment	4				X			
Overall opinion	4							

Criteria 4 – Student Assessment

Criterion	Rating	1	2	3	4	5	6	7
4.1 Variety of assessment methods aligned with ELOs	4				X			
4.2 Assessment & appeal policies explicit & consistent	4				X			
4.3 Standards for progression & degree completion explicit & consistent	4				X			
4.4 Assessments include rubrics, marking schemes, regulations	4				X			
4.5 Assessment measures achievement of ELOs	4				X			
4.6 Feedback on assessments provided timely	4				X			
4.7 Assessment processes reviewed & improved	4				X			
Overall opinion	4							

Criteria 5 – Academic Staff Quality

Criterion	Rating	1	2	3	4	5	6	7
5.1 Staff planning (succession, promotion, retirement) ensures quality & quantity	4				X			
5.2 Staff workload measured & monitored	4				X			
5.3 Staff competences determined, evaluated, communicated	4				X			
5.4 Duties allocated appropriate to qualifications	4				X			
5.5 Promotion based on merit (teaching, research, service)	4				X			
5.6 Rights, privileges, ethics, academic freedom defined	4				X			
5.7 Training & development needs identified & implemented	4				X			
5.8 Performance management, reward, recognition implemented	4				X			
Overall opinion	4							

Criteria 6 – Student Quality and Support

Criterion	Rating	1	2	3	4	5	6	7
6.1 Student intake policy & admission procedures explicit	4				X			
6.2 Short & long-term planning of support services	4				X			
6.3 Student progress, performance, workload monitored	4				X			
6.4 Co-curricular, support services available	4				X			
6.5 Support staff competences identified & evaluated	4				X			
6.6 Student support services evaluated, benchmarked, enhanced	4				X			
Overall opinion	4							

Criteria 7 – Support Staff and Facilities

Criterion	Rating	1	2	3	4	5	6	7
7.1 Physical resources sufficient	4				X			
7.2 Laboratories & equipment up-to-date & effectively deployed	4				X			
7.3 Digital library available	4				X			
7.4 IT systems meet staff & student needs	4				X			
7.5 Computer & network infrastructure accessible	4				X			
7.6 Environmental, health, safety, accessibility standards implemented	4				X			
7.7 Physical, social, psychological environment conducive	4				X			
7.8 Support staff competences identified & evaluated	4				X			
7.9 Quality of facilities evaluated & enhanced	4				X			
Overall opinion	4							

III. Strengths and Weakness Analysis

Upon Program's view finding, strengths, weakness and improvement plans could be:

Strengths

- ELOs are clearly aligned with TQF, Bloom's taxonomy, and the vision/mission of KMITL and IMSE.
- Mapping with courses and CLOs (Table 1.2.1) shows strong constructive alignment.

Weaknesses

- Very small number of students; difficult to demonstrate achievement of ELOs at graduation.
- Stakeholder feedback exists, but systematic evidence collection can be strengthened.
- Generic and subject-specific outcomes are covered, but need clearer evidence in practice.

Improvement Plan

- Expand documentation of stakeholder involvement.
- Collect more direct evidence of ELO achievement when the first cohort graduates.
- Strengthen mechanisms to review and communicate ELO updates periodically.

IV. APPENDICES

Exhibit 1.1	The official TQF2 (Internally Revised)
Exhibit 2.1	The official TQF2 (Internally Revised)
Exhibit 2.3	TQF3
Exhibit 2.4	TQF5
Exhibit 4.1.1	Rubric Assessment for Seminar
Exhibit 4.1.2	Rubric Assessment for Thesis
Exhibit 5.1	Staff Timing
Exhibit 5.2	FTES
Exhibit 5.3	Research Outputs (Last 5 Years)
Exhibit 5.7	Academic Staff Training
Exhibit 7	Summary of Equipment