

Table 1.3: The difference of ELO of the TME programme 2009, 2014 and 2017

2009*	2014	2017
1. Strong specialized knowledge to adapt well to different jobs' requirements in the broad field of Transportation Mechanical Engineering	1. Strong specialized knowledge to adapt well to different jobs' requirements in the broad field of Transportation Mechanical Engineering	1. Be equipped with comprehensive core and advanced engineering knowledge to get adapted successfully to jobs relevant to their disciplines, with due focus on abilities to apply core and advanced transport mechanical engineering knowledge and modern instruments to design and develop transport mechanical engineering products, including:
1.1. The ability to apply mathematics, physics, statistical probability to describe, calculate and simulate technical systems; as well as processes and technical products in the field of mechanics, internal combustion engine, automobile, and machine and hydrolic automation.	1.1. The ability to apply mathematics, physics, statistical probability to describe, calculate and simulate technical systems; as well as processes and technical products in the field of mechanics, internal combustion engine, automobile, and machine and hydrolic automation.	1.1. Abilities to apply knowledge of underlying mathematics and science to design transport mechanical engineering systems/machines.
1.2.The ability to apply mechanical theory, machinery mechanics, heat technology, technical drawing and CAD ... to study, analyze and designe mechanical equipments and systems, as well as technical products in the field of mechanics, internal combustion engine, automobile, and machine and hydrolic automation.	1.2.The ability to apply mechanical theory, machinery mechanics, heat technology, technical drawing and CAD ... to study, analyze and designe mechanical equipments and systems, as well as technical products in the field of mechanics, internal combustion engine, automobile, and machine and hydrolic automation.	1.2. Abilities to use core and advanced engineering knowledge to analyze mechanical engineering systems/machines.
1.3. The ability to apply knowledge of the dynamic engineerings, mechanical power train, hydrolic dynamics, ...along with the ability to exploit, apply modern methods and tools to design, asses systematic solution and technical products in the field of mechanics, internal combustion engine, automobile, and machine and hydrolic automation.	1.3. The ability to apply knowledge of the dynamic engineerings, mechanical power train, hydrolic dynamics, ...along with the ability to exploit, apply modern methods and tools to design, asses systematic solution and technical products in the field of mechanics, internal combustion engine, automobile, and machine and hydrolic automation.	1.3. Abilities to use advanced engineering knowledge, modern methods and instruments to design and assess mechanical engineering systems/machines.
2. Professional skills and qualities needed to succeed in a career	2. Professional skills and qualities needed to succeed in a career	2. Be equipped with personal and professional skills and attributes, lifelong learning and self-studied abilities to pursue higher levels of education to get adapted to the ongoing scientific and technological development, including:
2.1. Analytical thinking and problem-solving skill	2.1. Analytical thinking and problem-solving skill	2.1. Abilities to identify, determine and model technical problems, to estimate and analyse them quantitatively,

		to identify random factors, to come up with conclusions, solutions and recommendations.
2.2. Ability to experiment, research and explore knowledge	2.2. Ability to experiment, research and explore knowledge	2.2. Abilities to develop hypothesis and probabilities, to understand and select information from paper-based, electronic formats or internet, to conduct experimental surveys, to verify and prove hypothesis.
2.3. Systematic thinking and critical thinking.	2.3. Systematic thinking and critical thinking.	2.3. Abilities to develop a holistic view of any problems, to identify emerging problems and interactions in systems, to arrange and determine key factors as well as to analyse strengths and weaknesses and come up with solutions.
2.4. Seriousness, creativity, dynamism	2.4. Seriousness, creativity, dynamism	2.4. Abilities to be persistent and flexible, willing to take risks, and know how to make full use of creative and critical thinking, to conduct self-evaluation of one's own knowledge, skills and attitudes, to know how to study for lifelong learning; to manage time and resources.
2.5. Ethics and professional responsibility.	2.5. Ethics and professional responsibility.	2.5. Professional ethics and conduct, honesty and sense of responsibility, proactive career planning, regular self-updating of technical information.
2.6. Understanding contemporary issues and lifelong learning.	2.6. Understanding contemporary issues and lifelong learning.	
3. Social skills needed to work effectively in a multidisciplinary team and in an international environment:	3. Social skills needed to work effectively in a multidisciplinary team and in an international environment:	3. Be equipped with communication and teamwork skills, including:
3.1. Organizational skills, leadership and teamwork (multi-disciplinary)	3.1. Organizational skills, leadership and teamwork (multi-disciplinary)	3.1. Abilities to set up, develop teams including technical, multi-disciplinary ones, and to organize team activities.
3.2. Effective communication skills through writing, presenting, discussing, negotiating, mastering the situation, using effective tools and modern means.	3.2. Effective communication skills through writing, presenting, discussing, negotiating, mastering the situation, using effective tools and modern means.	3.2. Abilities to select effective communication strategies, to develop communication structures, to communicate effectively in writing, multimedia and graphic media with good presentation skills.
3.3. Effective use of English in the workplace, TOEIC score ≥ 450 .	3.3. Effective use of English in the workplace, TOEIC score ≥ 450 .	3.3. Good English proficiency at work with minimum TOEIC score of 500.
4. The ability of development of product design, technical solutions in the field transportation mechanical engineerings in the context of world-	4. The ability of development of product design, technical solutions in the field transportation mechanical engineerings in the context of world-	4. Conceive ideas for the purpose of design, development and operation in enterprise and social settings, including:

wide fast growing industry that has a great influence on the domestic transportation mechanical engineering industry	wide fast growing industry that has a great influence on the domestic transportation mechanical engineering industry	
4.1. Awareness of the close relationship between technical solutions and economic, social and environmental factors in the globalized world.	4.1. Awareness of the close relationship between technical solutions and economic, social and environmental factors in the globalized world.	4.1. Understanding roles and responsibilities that engineer holders should have in the society, impact that technological applications can have on the society, related legislations and regulations, historical and cultural contexts, global current development issues and prospects.
4.2. Capability to identify problems and form ideas of technical solutions, participate in project development and deployment, and participate in technology transfer in the field of Transportation Mechanical Engineering.	4.2. Capability to identify problems and form ideas of technical solutions, participate in project development and deployment, and participate in technology transfer in the field of Transportation Mechanical Engineering.	4.2. Respecting multicultural values, mastering business strategies, objectives and plans of the respective organization, having technical commercialization mindset, being adaptable to different working environments.
4.3. Capability to design systems, products and technical solutions in the field of mechanics, internal combustion engine, automobile, and machine and hydrolic automation.	4.3. Capability to design systems, products and technical solutions in the field of mechanics, internal combustion engine, automobile, and machine and hydrolic automation.	4.3. Being able to develop objectives, requirements for technical systems, to define their functions, concepts and structures; to do technical system modelling for feasibility, and to develop project implementation plans.
4.4. Capability to deploy systems, manufacture products and implement technical solutions in the field of mechanics, internal combustion engine, automobile, and machine and hydrolic automation.	4.4. Capability to deploy systems, manufacture products and implement technical solutions in the field of mechanics, internal combustion engine, automobile, and machine and hydrolic automation.	4.4. Being able to develop and analyze design processes and approaches, to apply technical knowledge and analytical results in designs, to design and work in multidisciplinary teams, to understand multi-objective designing.
4.5. Capability to operate, use and exploit systems, products and technical solutions in the field of mechanics, internal combustion engine, automobile, and machine and hydrolic automation.	4.5. Capability to operate, use and exploit systems, products and technical solutions in the field of mechanics, internal combustion engine, automobile, and machine and hydrolic automation.	4.5. Being able to plan system development, implementation and analysis; to apply control system knowledge, to program diagnosis integrated with both software and hardware, to understand relevant sets of testing standards, to test, verify and validate, monitor and manage the implementation process.
		4.6. Being able to develop and optimize operation process and operation process training, to understand other support options related to the system operation process, system improvement and development, system demobilization, operation process management.
5. Political and ethics qualities, awareness of serving the people, good health to meet the requirements of building and defending the Fatherland:	5. Political and ethics qualities, awareness of serving the people, good health to meet the requirements of building and defending the	5. Have political quality and willingness to serve people, to have good health and meet requirements in developing and defending the country, including:

	Fatherland:	
5.1. Sufficient level of political theory in accordance with the general rules of the Ministry of Education and Training	5.1. Sufficient level of political theory in accordance with the general rules of the Ministry of Education and Training	5.1. Political theory qualifications in line with general programs and regulations of the Vietnam Ministry of Education and Training.
5.2. A Certificate of Physical Education and a Certificate of Defense Education in accordance with general rules of the Ministry of Education and Training	5.2. A Certificate of Physical Education and a Certificate of Defense Education in accordance with general rules of the Ministry of Education and Training	5.2. Physical Education Certificate and Military Training Certificate in line with general programs and regulations of the Vietnam Ministry of Education and Training.

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