

# **Test of English for Thai Engineers and Technologists (TETET)**

## **Technical Report**

Natjiree Jaturapitakkul  
Richard Watson Todd  
January 2018

### **Test objectives**

The Test of English for Thai Engineers and Technologists (TETET) is an English language proficiency test for people whose native language is not English. Specifically, it aims to test the English language proficiency of Thais in engineering and technological working environments. TETET aims to test English language proficiency in the four language skills (reading, writing, listening, and speaking) with the content based on situations in which Thai engineers and technologists are most likely to need to use English. The test does not, however, require any specialized knowledge or vocabulary beyond that of a person who uses English in everyday work activities. Therefore, people from other disciplines can take the test as well.

TETET is designed to be taken by two main groups of test-takers:

1. People working (or wanting to work) in engineering and technological positions in companies in Thailand.
2. Undergraduate and postgraduate students of engineering and technical subjects.

For the first group, companies can use TETET to evaluate candidates' suitability for employment in positions where English language proficiency may be required and to evaluate employees' suitability for job assignment, promotion and placement into training programmes. For the second group, universities can use TETET to assist students in job placement, to provide a measure of students' engineering-specific English proficiency and to allow students to self-evaluate their English proficiency.

### **Test design sources**

The content of TETET is based on a large-scale survey of the English language needs of engineers and technologists in Thailand. Four key groups of informants provided information which informed the design of the test:

1. Human resources managers of major engineering companies in Thailand.
2. Senior university administrators at Thai universities offering engineering/technical degree programmes.
3. Experienced engineers and technologists working in Thai companies.
4. Senior undergraduate students studying engineering/technical degrees.

### **Test format and content**

TETET is a computer-based test. All test input is delivered via computer and all test-taker responses are recorded onto computer. The content in all sections is designed to mirror the real-world uses of English experienced and encountered by Thai engineers and technologists. The test covers the four language skills and consists of 12 sections with a range of item types used. The complete test takes approximately 2 to 2.5 hours. The table below presents an overall picture of the TETET sections with more details given following the table.

Skill	Section	Item type	No. of items	Time
<b>Reading</b>	1. Survival reading	Multiple choice	5	3 minutes
	2. Reading from the Internet	Table-filling (Drag and drop information)	10	15 minutes
	3. Reading technical manuals	Matching/ Drag and drop objects	6+6	15 minutes
	4. Reading e-mails	Multiple choice	5	10 minutes
<b>Listening</b>	1. Listening to meetings	Dictation/ short-answer questions	8+ 3	15 minutes
	2. Listening to informal conversations	Multiple choice	5	10 minutes
	3. Listening on telephones (Automated Voice Response System-AVRS)	Step record (inputting numbers)	10	10 minutes
<b>Writing</b>	1. Writing reports	Gap-filling	10	15 minutes
	2. Writing memoranda	Sequencing	5	10 minutes
	3. Writing e-mails	Composition	1	15 minutes
<b>Speaking</b>	1. Speaking in short question-and-answer format	Short answer (Voice-recording)	8	4 minutes
	2. Speaking in longer business communications	Leaving a message (Voice-recording)	2	5 minutes

### **Reading skill**

#### **Section 1: Survival reading**

The objective of this section is to measure basic reading abilities. It consists of 5 multiple choice questions. The candidates read through drop-down information such as a company telephone directory and respond within three minutes according to the five multiple-choice questions or situations given (For example, which telephone number would you call if you want to collect some money from the company?)

#### **Section 2: Reading from the Internet**

This section aims to measure reading comprehension and evaluation. This section is in the form of drag-and-drop texts. There are two situations in this section, 5 items each. Each requires candidates to go through information in a range of off-line webpages provided and select (copy) only key texts to put (paste) in a table on the test page.

#### **Section 3: Reading technical manuals**

This section is aimed at measuring the ability to read instructions. It consists of two situations, 6 items each. The first situation requires the candidates to follow instructions and set up a device or some kind of equipment. The candidates need to match the pictures with the step-by-step instructions given by clicking on the answer and selecting the letter (A to F) that represents each instruction. For the second situation, the candidates have to read and follow workplace safety regulations. The candidates need to read each regulation and move an object that is against the regulation to its proper place.

#### **Section 4: Reading e-mails**

This section measures the ability to read for communication. It requires the candidates to read the email provided and answer five multiple-choice questions. Questions are asked about the main idea, details and inferences.

#### **Listening skill**

##### **Section 1: Listening to meetings**

This section measures the ability to identify both gist and specific meanings with multiple speakers. It consists of 2 sub-sections. The first section is a partial dictation where candidates listen to people talking in a meeting based on scripts provided. The candidates type in the 8 missing words from the script. The second section involves listening to a conversation in a formal meeting. It requires candidates to type in short answers to the questions in the spaces provided. The listening files can be played twice for both sub-sections.

##### **Section 2: Listening to informal conversations**

This part is aimed at measuring the ability to draw inferences from conversations. The candidates need to listen to 5 informal conversations between colleagues on general topics and answer 5 multiple-choice questions. Each conversation can be played twice.

##### **Section 3: Listening on telephones (Automated Voice Response System - AVRS)**

This section aims to measure the ability to understand specific instructions. It involves interacting by telephone. Candidates have to listen to an automated voice over the phone and interact by clicking on the relevant buttons on a touch-tone telephone provided in response to the situation given. If there are any mistakes, the candidates can start over again.

#### **Writing skill**

##### **Section 1: Writing reports**

This section measures the ability to use common phrases in written texts. It requires candidates to complete a report by dragging and dropping pieces of text given into 10 blanks. The texts are related to common phrases in report writing.

##### **Section 2: Writing memoranda**

This section aims to measure grammatical accuracy in written texts. The candidates complete a memorandum by rearranging pieces of text given to form a grammatically correct sentence. There are 5 sentences to complete.

##### **Section 3: Writing e-mails**

This section is aimed at measuring ability to write extended texts. The candidates are required to compose an email corresponding to a given situation. In composing this email, the candidates can make use of key information like a brochure or a leaflet provided on the left of the computer screen to compose their email in the template provided on the right.

#### **Speaking skill**

##### **Section 1: Speaking in short question-and-answer format**

This section measures the ability to engage in interactional speaking. It is similar to an interview focusing on general personal life. The candidates hear questions from an artificial interviewer and answer by recording their voice after hearing the beep sound.

##### **Section 2: Speaking in longer business communications**

The last speaking section is aimed at measuring the ability to produce comprehensible longer discourse which is similar to leaving a telephone message. The candidates can make use of information given in the instructions to create the message and record their message after hearing the beep sound.

### TETET score reporting

The scores on each section are reported by converting the number of questions answered correctly (raw scores) to the scores which are reported (band levels). Candidates receive 5 scores when they take TETET: an overall score and a score for each of the 4 language skills. TETET scores range from Level 0 (no evidence of English proficiency) to Level 7 (near-native speaker like English proficiency). In addition, when reporting an overall score, it is subdivided into two levels (no decimal and '.5'). This could allow a narrow band and contribute to a more accurate result of a candidate's English proficiency. It is important to note that the sub-division of level grades is based on the relationship between the skill-specific level grades and the overall level grade. Where skill-specific level grades are generally higher than overall level grade (i.e. either mean skill level or mode skill level), the test-taker will be placed in the higher sub-division of the overall level grade, e.g. in 2.5, not in 2.

The TETET band descriptors representing the specific meanings of each level for the overall test and for each skill are shown in the following tables.

Level	Overall TETET
<b>7</b>	Has fully operational command of the language in all workplace situations, both formal and informal.
<b>6-6.5</b>	Has competent operational command of the language in nearly all workplace situations.
<b>5-5.5</b>	Has operational command of the language in most workplace situations, with occasional inaccuracies, inappropriacies and misunderstandings in some complicated or unfamiliar situations.
<b>4-4.5</b>	Has generally effective command of the language in simple workplace situations, with some inaccuracies, inappropriacies and misunderstandings, and may have difficulty in complicated or unfamiliar situations.
<b>3-3.5</b>	Has partial command of the language in simple workplace situations, but likely to make many mistakes, and has great problems in dealing with complicated or unfamiliar situations.
<b>2-2.5</b>	Has some basic ability to use the language in simple workplace situations, although with frequent problems in understanding and expression. Unable to use the language in complicated or unfamiliar situations.
<b>1-1.5</b>	No real communication is possible except for very basic information using isolated words or short formulae in familiar situations. Has great difficulty understanding the language.
<b>0</b>	No evidence to show the ability to use the language beyond a few isolated words.

Level	Reading	Listening	Speaking	Writing
7	Able to fully understand different forms of texts concerned with workplace needs and to function effectively in workplace reading situations.	Able to fully understand and function effectively in all workplace listening situations, both formal and informal.	Able to speak fluently, accurately, coherently and comprehensibly in all situations, both conversations and monologues.	Able to write accurately, fluently and comprehensibly in different forms of writing concerned with workplace needs and to accomplish the expected communicative functions of written texts appropriately.

6	Able to understand a variety of forms of texts concerned with workplace needs and to function competently in workplace reading situations.	Able to understand and function effectively in nearly all workplace listening situations.	Able to speak fluently, accurately, coherently and comprehensibly in nearly all situations.	Able to write with sufficient accuracy, fluency and comprehensibility in a variety of forms of writing concerned with workplace needs.
5	Able to understand most work-related reading situations including understanding and selecting appropriate information from the Internet and understanding e-mails.	Able to understand and function in most workplace listening situations such as following general instructions, obtaining information, and comprehending details of a formal meeting.	Speaks in conversations and monologues with an acceptable level of comprehensibility, and fluency, but may be obliged to pause and self-correct at times.	Able to complete most job-related writing for both short and long texts with an acceptable level of comprehensibility, fluency and accuracy.
4	Able to understand straightforward reading texts, such as instructions and explanations in technical manuals, but has some difficulties with more complex texts.	Able to understand predictable informal conversations in a workplace and can follow general instructions, but has some difficulties in complex situations.	Copes well with familiar speech situations, and performs adequately in less predictable contexts where there may be some fluency and accuracy problems.	Copes well with familiar written situations by producing both short and long texts, and performs adequately in less predictable contexts such as writing a report where there may be some fluency and accuracy problems.
3	Has an adequate understanding of simple texts for immediate survival needs, such as finding information in telephone directories, and is able to find specific facts from texts.	Has an adequate understanding of predictable listening situations such as general instructions, but comprehension is severely reduced in more complex situations.	Able to answer comprehensibly and fluently in predictable dialogues, but there may be occasional appropriacy, fluency and pronunciation problems.	Able to produce comprehensible short writing such as writing a short note or memorandum, but there may be occasional grammatical or cohesion problems interfering with communication.
2	Understands short simple texts and some high frequency words and expressions, but has substantial difficulties with longer texts.	Shows minimal understanding of predictable listening situations and almost no comprehension in more complex situations.	Copes adequately with familiar speech situations, but speech may be slow, full of pauses and difficult to comprehend at times.	Copes adequately with familiar written situations by producing short sentences with formulaic written patterns, but has substantial difficulties with longer sentences, and grammatical and cohesion problems regularly interfere with communication.
1	Understands frequently used isolated words in workplace texts, but exhibits no ability to understand longer texts.	Understands some frequently used isolated words in informal conversations and general instructions, but exhibits no ability to understand or perform in complex listening situations.	Able to provide marginally comprehensible responses to predictable questions but unable to sustain fluent comprehensible speech.	Able to produce partially comprehensible writing only for a few words or short sentences, but unable to write longer sentences or texts.
0	Shows no evidence of reading ability	Shows no evidence of listening ability	Shows no evidence of writing ability	Shows no evidence of communicative speaking ability

### **TETET scoring procedures**

Depending on the item type used in each section, TETET combines objective automated computer marking with human marking. For the 4 sections which are human marked, namely, listening to meeting, email writing and two sections of speaking, clear specific marking criteria are used and markers are trained to ensure reliability. From a training session of TETET, inter-marker reliability on the 4 sections averages 0.875 (significant at  $p < 0.01$ ) suggesting that human marker error is not an issue in TETET.

### **Correlations between different sections of TETET**

The correlations between the different sections of TETET taken by 400 test-takers in academic year 2017 are shown in the following table.

	Reading	Listening	Writing	Speaking
TETET Total	0.823	0.876	0.859	0.838
Speaking	0.587	0.648	0.628	
Writing	0.605	0.680		
Listening	0.617			

All of these correlations are significant at  $p < 0.01$ , implying that there are very strong relationships between scores on the different sections. In general, TETET Total and Listening scores were most closely correlated; and Writing and Speaking scores were more highly correlated than was Reading scores. These correlations are also consistent with earlier research conducted in 2006 (Watson Todd, 2006).

### **TETET test validity**

Validity has to do with the extent to which a test measures what it purports to measure, and thus whether the scores can be used for certain purposes.

The most common form of test validation is correlation with other established methods that purport to measure the same construct. This is termed construct validity. If the two tests aim to measure the same ability, then scores on the two tests should be related to each other. The standardized test which most closely resembles TETET in terms of purpose is the TOEIC test, since this also aims to measure workplace English proficiency (although TOEIC is restricted to reading and listening). Comparing scores from 124 test-takers who took the TETET and TOEIC in October 2016, the correlation between TETET scores and TOEIC scores is 0.883 ( $p < 0.001$ ), implying that TETET and TOEIC are very strongly correlated. The correlation between TETET levels and TOEIC scores is also very strong ( $r = 0.876$ ;  $p < 0.001$ ). A rough guide for comparison of TETET levels and TOEIC scores is as follows:

<b>TETET level</b>	<b>TOEIC score</b>
0	0-145
1	150-265
1.5	270-340
2	345-415
2.5	420-490
3	495-535
3.5	540-575
4	580-645
4.5	650-705
5	710-745
5.5	750-815
6	820-880
6.5	885-945
7	950-990

### **TETET test reliability**

Reliability is an indicator of consistency of test scores. In a reliable test, the same test-taker should score very similarly on 2 versions of the test, and two similar test-takers should receive similar scores.

#### *Correlations between different versions of TETET*

TETET uses several different versions of the test. There could be some cases when one candidate takes 2 versions of TETET at different time. The following table shows the correlations in scores between two different versions of the TETET for 200 post graduate test-takers over a two-year timeframe (2016-2017).

Total TETET	0.687
Reading	0.361
Listening	0.477
Writing	0.557
Speaking	0.387

In these results, the correlation between the two versions of total TETET scores is 0.687 which indicates that there is a strong positive relationship between different versions overall even though the relationship between versions for individual skills may be moderate. All of these correlations are significant at  $p < 0.01$ , implying that results from different versions of the test are comparable.

In addition, a paired samples t-test was conducted to compare scores between two versions of TETET. It indicates that there was no significant difference in the scores of two versions ( $t(199) = -3.594, p < 0.01$ ). This suggests that when candidates take one TETET version, their scores should be more or less the same when taking other versions.

#### *KR-21 reliability estimates*

Internal consistency within TETET can be measured using the KR-21 reliability coefficient, which assesses the consistency of candidates' responses to different questions and thus measures the homogeneity of the test content. Total TETET scores from 400 test-takers show KR-21 scores of 0.855 which implies high internal consistency in the test.

#### *Standard error of measurement*

A further reliability measure, the standard error of measurement, aims to measure the extent to which scores may fluctuate due to chance factors unrelated to the test. For TETET overall scores from 400 test-takers, the standard error of measurement is 0.99%, implying that outside factors have very little influence on TETET scores.

## **Mapping TETET with the Common European Framework of Reference for Languages (CEFR)**

### **Background**

The Common European Framework of Reference for Languages: Learning, Teaching, Assessment (Council of Europe, 2001), known as CEFR, provides a common basis for describing the skills needed to reach different levels of language proficiency, and is used by nonnative language learners, instructors, educators, curriculum designers, testing organizations and agencies working in the field of language development. The CEFR

describes language proficiency in listening, reading, speaking and writing on a six-level scale, clustered in three bands (See Attachment 1):

- A1–A2 (Basic User)
- B1–B2 (Independent User)
- C1–C2 (Proficient User)

The CEFR provides band descriptors that may be used to interpret the meaning and practical significance of scores on language tests. If a test score can be equated with one of the levels of the CEFR, what that score means and what candidates with at least that score are likely to be able to do becomes clear. By doing so, mapping other tests with CEFR levels is recommended and can be done through a standard setting study. However, when comparing other tests with CEFR, it is important to understand that the process is complex and there are differences in test purposes, measurement scales, test formats, test delivery modes and test taker populations.

To help candidates understand the relationship between TETET band levels and the six CEFR levels, a study relating TETET to CEFR needed to be conducted. The purpose of this mapping study was to identify the minimum scores/levels on the TETET test sections corresponding to each CEFR level. As such, we can understand what each candidate is likely to be able to perform in terms of language proficiency regarding the TETET level gained in relation to the equivalent CEFR level. In addition, carrying out score mapping study can ensure that reliable and precise correlations can be made over time.

### **Standard-setting Study**

In order to relate the TETET to CEFR, a standard-setting study is implemented. Standard setting is the process by which a panel of informed experts makes score requirement recommendations that correspond with the level of knowledge, skill, proficiency, mastery or readiness candidates need in order to be placed in a certain category. For this study, the panel consisted of 10 experts (3 English-language instructors, 3 language testing experts, and 4 subject experts in engineering, science and information technology) from 4 different leading universities in Thailand, namely, Chulalongkorn University, Kasetsart University, King Mongkut's University of Technology North Bangkok and King Mongkut's University of Technology Thonburi. The panel of experts was organized as a two-day-workshop on 28-29 October, 2017 at the School of Liberal Arts, King Mongkut's University of Technology Thonburi.

### **Standard-setting procedures**

This standard setting study was conducted using the Kaftandjieva & Takala Compound Cumulative Method since it fitted with the TETET test tasks and its various scoring methods. Each panelist was asked to study descriptors of both TETET and CEFR (both global and illustrative scales for each skill) beforehand and undergo some training to familiarize with the CEFR descriptors. Then, each assessed individual TETET test item (covering all four skills, section by section) which was evaluated based on the CEFR levels and descriptors answering the question: At what CEFR level (A1 through C2) can a test taker answer the following item correctly? Based on the aggregated judgements, the core difficulty bands for each level were established. Items were assigned to corresponding CEFR levels depending on the band in which the item difficulty falls. Some items were reassigned to CEFR levels because the original assignment given by the panelists did not match the empirical difficulty. From the final assignment, most panelists (two thirds) agreed on the item difficulty falling into each band. The item difficulty representing the percentage of test takers responding correctly to items rated by experts is summarized in the table below. Cut-off scores were then established on the basis of cumulative frequency distribution of items into CEFR levels.

<b>CEFR Level</b>	<b>Percentage of test takers responding correctly to items rated by experts</b>
A1	86-100%
A2	70-88%
B1	42-69%
B2	20-60%
C1	1-5%
C2	-

NOTE: No items of TETET are equivalent to C2 level.

## Results

Based on the aforementioned standard-setting procedures, the table below presents the recommended levels of TETET overall proficiency equivalent to CEFR proficiency levels. Please note that the TETET levels referred to are the overall band scores that will be reported on the Score Report Form, and not the band scores for individual skills. They should be considered guidelines, as SoLA does not recommend the use of rigid cut scores.

<i>TETET level</i>	<i>CEFR level</i>
1, 1.5, 2, 2.5	A1
3	A2
3.5, 4	B1
4.5, 5, 5.5	B2
6, 6.5, 7	C1

## Equivalency Table for TETET

As a summary of the study, the following table shows the comparison between TETET levels and two other commonly used measures of English proficiency: CEFR (Common European Framework of Reference for Languages) and TOEIC (Test of English for International Communication) based on empirical research studies conducted during 2016-2017. In addition, IELTS and TOEFL are included to give clearer picture of the comparison (based on existing sources from IELTS (2017) and ETS (2018)).

<b>TETET Level</b>	<b>CEFR Level</b>	<b>TOEIC score (0-990)</b>	<b>IELTS (0-9.0)</b>	<b>TOEFL iBT (0-120)</b>	<b>TOEFL PBT (0-677)</b>
1.0	A1	150	n/a	n/a	n/a
1.5		270			
2.0		345			
2.5		420			
3.0	A2	495	n/a	n/a	n/a
3.5	B1	540	4.0-5.0	42-71	440
4.0		580			
4.5	B2	650	5.5-6.0	72-94	533
5.0		710			
5.5		750			
6.0	C1	820	6.5-8.0	Above 95	587
6.5		885			
7.0		950			

## **References**

- Council of Europe. (2001). The Common European Framework of Reference for Languages: Learning, Teaching, Assessment. Retrieved from <https://rm.coe.int/16802fc1bf>
- ETS (2018). Compare TOEFL Scores. Retrieved from <https://www.ets.org/toefl/institutions/scores/compare/>
- IELTS (2017). Common European Framework for IELTS. Retrieved from <https://www.ielts.org/ielts-for-organisations/common-european-framework>
- Watson Todd, R. (2006). Test of English for Thai Engineers and Technicians (TETET) Technical Report. [Unpublished raw data].

**Attachment 1: CEFR Common Reference Levels: global scale**

Proficient User	C2	Can understand with ease virtually everything heard or read. Can summarise information from different spoken and written sources, reconstructing arguments and accounts in a coherent presentation. Can express him/herself spontaneously, very fluently and precisely, differentiating finer shades of meaning even in more complex situations.
	C1	Can understand a wide range of demanding, longer texts, and recognize implicit meaning. Can express him/herself fluently and spontaneously without much obvious searching for expressions. Can use language flexibly and effectively for social, academic and professional purposes. Can produce clear, well-structured, detailed text on complex subjects, showing controlled use of organisational patterns, connectors and cohesive devices.
Independent User	B2	Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.
	B1	Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics which are familiar or of personal interest. Can describe experiences and events, dreams, hopes and ambitions and briefly give reasons and explanations for opinions and plans.
Basic User	A2	Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. Can describe in simple terms aspects of his/her background, immediate environment and matters in areas of immediate need.
	A1	Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. Can introduce him/herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has. Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.