



Course Outline

SEAMEO VOTTECH-TEMASEK FOUNDATION-ITEES

Technical Skills Upgrading Programme TVET Teachers & Trainers in Southeast Asia on Automotive Engineering

17 – 28 SEPTEMBER 2018

RATIONALE

In response to the positive feedbacks from various stakeholders in regard to the implementation of the first round training programme on Technical Skills Upgrading Programme for TVET Teachers in Southeast Asia from 2013 to 2015, and with the support from the Board during the 26th GBM for continuing the programme, SEAMEO VOTTECH, in collaboration with ITEES and TEMASEK Foundation, Singapore, is again organising the second round of skills upgrading training programmes for TVET teachers and trainers in Southeast Asia, to help member-countries build a core group of TVET teachers/trainers considered as change agents who will improve the TVET delivery in the trade area of Automotive Engineering.

Automotive Engineering is the third of the second round of skills upgrading training programme that will be conducted for FY 2018-2019, and will be held from 17 – 28 September, 2018, at the Institute of Technical Education (ITE), Singapore. Meant for technical and vocational teachers and trainers, this training programme is aimed at upgrading their technical/vocational skills, while at the same time mastering the pedagogical skills to train the technical/vocational subjects, thus becoming **Master Trainers**.

This skills upgrading training programme aims to achieve the following objectives: (1) to enhance technical/vocational and pedagogical skills of master trainers in the area of Automotive Engineering, and (2) to enhance technical/vocational and pedagogical skills of other instructors and trainers by conducting Post-Training Sharing Workshop (PSW) by the master trainers in their home countries. The conduct of 5-day Post-Training Sharing Workshop by the Master Trainers to their peers (3 times the number of participants attending the training in Singapore) in the participants' home country is a mandatory requirement for attending this programme. Please see ***THE SCENARIO OF TRAINING PROGRAMME*** for more details.

OBJECTIVES

Specifically, at the end this training programme, the participants should be able to:

1. explain the Powertrain Management Systems;
2. assemble and rebuild engine;
3. explain and apply the functions of brake systems;
4. explain and apply the principles of wheel alignment;
5. perform steering and suspension-related functions;
6. explain and apply the construction and operating principles of common rail diesel system;
7. explain and operate EURO 6 Emission Control Systems;

8. explain and operate the different types of electric/hybrid drive systems and vehicles;
and
9. explain, apply the principles and interpret the data of the Central Body Electrics.

CONTENTS

1. Powertrain Management Systems

This module introduces the participants to the Powertrain Management Systems. Learning contents to be covered will include Engine and Driveline Management and Stability Control System.

2. Engine Rebuilding and Assembling

This module covers all activities relevant to the effective and efficient engine rebuilding and assembling. Content details under Engine Rebuilding include Disassembly; Cylinder Head Repair – Camshafts, Variable Valve Timing Mechanism, Valve Assembly; and Engine Block – Piston Assembly, Crankshaft, and Lubrication System.

With Engine Assembling, the following content details are covered: Cylinder Head, Engine Block, and Functional Test. An important component of this module is the Study Visit to Automotive Hub, where participants will have the opportunity to physically see and observe activities involving Multi-level Set-up, Multi-brand capabilities and Self-contained Hub business model.

3. Chassis and Brake Systems

This module consists of the following: i) **Brake Systems** - Anti-Lock Brake Systems: Brake Dynamic Test and Interpreting Test Results; ii) **Wheel Alignment** – Wheel Alignment Principles, Pre-Alignment Set-up, and Operation of Wheel Alignment Equipment; and iii) **Steering and Suspension** – Electric Power Steering, Active Suspension, Suspension Dynamic Test, and Interpreting Results. This module will allow the participants for a Study Visit to Vehicle Inspection Centre, where they can physically observe actual Test Sequence and Equipment Layout.

4. Common Rail Diesel System

Covered in this module are the following: Construction and Operating Principles, and Components Layout and Location.

5. EURO 6 Emission Control Systems

This module introduces the participants to the following: Gasoline Engines, Diesel engines, and Test Methodology.

6. Types of Electric/Hybrid Drive Systems and Vehicles

This module covers the following topics: Types of Hybrid Drive Systems – Series, Parallel and Series-Parallel. Also covered in this module are aspects of Electric Vehicles – its Characteristics & Performance, Comparison between Hybrid & Electric Systems, Advantages & Disadvantages of Hybrid & Electric Vehicles, and Diagnostic Methodology. Part of this module

is the Study Visit to Vehicle Pre-delivery Centre, where participants will see for themselves Pre-delivery Inspection and Quality Control activities.

7. Central Body Electrics

In this module, participants will be introduced and have the opportunity to understand the aspects of Central Body Electrics, particularly in the following: Architecture, Construction Features, Operating Principles, Test Equipment, and Interpret Data.

8. Present Individual Learning Portfolio

At the end of the two-week training programme, participants will have the opportunity to present their individual learning portfolios capturing all of the contents and activities covered during the training.

DURATION

The workshop to be held in ITE College West, Singapore, will run for 10 days, from 17 - 28 September 2018. **The Master Trainers who attend this training programme in Singapore must conduct a one-week Post-training Sharing Workshop that takes in their home countries scheduled between October 2018 – March 2019.** Monitoring will be carried out by ITEES and SEAMEO VOTTECH personnel to the Post Training Programmes.

DELIVERY METHODS

The medium of instruction of training in ITE Singapore is English, while the Post-training Sharing Workshop in the member countries can be in the national language/s. For Post-training Sharing Workshops that are shortlisted by ITEES for on-site observation and evaluation, an interpreter should be engaged by member countries to facilitate the observation and evaluation. The training approach will be mainly hands-on or practical lead by experience trainers in the technical areas in ITE workshops. Likewise, the Post-training Sharing Workshop will be using similar approaches.

EXPECTED OUTPUT

After undergoing this training programme, the participants are expected to develop an action plan and to organise a 5-day post-training sharing workshop in their respective countries. The number of participants of the post-training sharing workshop should be at least three times the number of participants in ITE Singapore. Detail of the workshop as reflected in **Table 1** below

Table 1 is the breakdown of the total number of participants trained by the Master Trainers which is three (3) times the number of participants attending the training in Singapore.

Topic of Training	Training for Master Trainers in Singapore*		Post training Sharing workshop in SEAMEO member countries
	Type of participant	# of participant	Minimum # of participant
Automotive Engineering	Scholarship	30	90
	Subsidised		

*Every instructor should only be nominated for one (1) programme. Participants of the Post-Training Sharing Workshops should not include instructors who have gone through any of the three programmes.

SCENARIO OF TRAINING PROGRAMME

The training programme consists of two phases: (1) training programme for 30 TVET master teachers in Singapore and (2) Post-Training Sharing Workshop in the participants' home countries for 90 trainers facilitated by the Master Trainers.

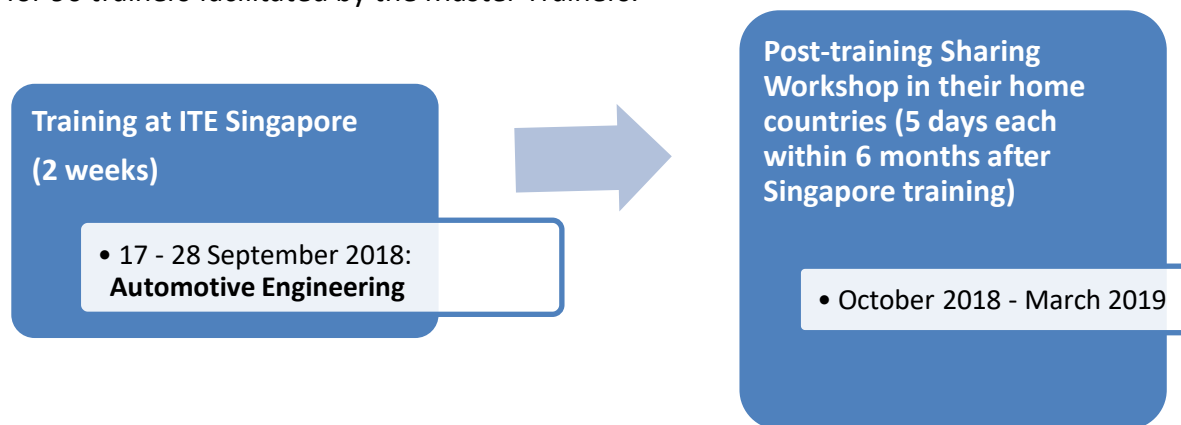


Figure 1. Training Design

Note: the proportion of theory and practical is about 30:70. Authentic teaching-learning and assessment approaches are embedded in the 2-week training.

FUNDING SOURCES AND FEE

The sources of fund for the pedagogical and technical training programme will be SEAMEO VOCTECH Regional Centre, TEMASEK Foundation, and the Governments/Institutions of the participating countries.

Table 2. The breakdown of the sources of funding for training in Singapore.

Component	Scholarship (Max 19 pax)	Subsidised (Min 11 pax)
Administrative Fee	SEAMEO VOCTECH	Ministry/Institution
Airfare	SEAMEO VOCTECH	Ministry/Institution
Travel Insurance	SEAMEO VOCTECH	SEAMEO VOCTECH
Local Transport	TEMASEK	TEMASEK
Accommodation	TEMASEK	TEMASEK
Allowance (About SG\$20/day/pax)	TEMASEK	TEMASEK

The administrative fee for Subsidised participant as for a Local participant (Brunei Darussalam) is BN\$1,500.00 and an International participant is US\$1,500.00.

To register please go to <https://goo.gl/forms/vl5Xf4MJxJm4johS2>

Table 3. The breakdown of the sources of funding for Post-Training Sharing Workshop to be conducted in the home countries Master Trainers. This workshop should be scheduled between October 2018 – March 2019.

Component	Master Trainers	Participants	Consultant/Expert from ITEES Singapore
Training Fee	-	-	-
Airfare (if any)	Ministry/Institution	Ministry/Institution	TEMASEK
Workshop	Ministry/Institution	Ministry/Institution	-
Local Transport	Ministry/Institution	Ministry/Institution	Ministry/Institution
Accommodation	Ministry/Institution	Ministry/Institution	TEMASEK
Allowance (if any)	Ministry/Institution	Ministry/Institution	TEMASEK
Travel Insurance (if any)	Ministry/Institution	Ministry/Institution	TEMASEK

TARGET PARTICIPANTS

The participants of this course are the programme heads and highly committed and motivated teachers/instructors/trainers of **Automotive Engineering** who have the capability to conduct post-training sharing workshop to their colleagues. They must have a good command in English, basic IT skills (MS Words, PowerPoint and Excel) and will still be active in teaching profession in the next 5 years.

PROCEDURES AND REQUIREMENTS

- Participants are required:
 - A cover letter signed by your nominating organisation
 - Has remains working duration of at least five years.
 - Healthy and fit to travel and attend training overseas.
 - Pregnant woman is not advisable to attend training overseas.
- TRAVEL DOCUMENTS:** All participants are required to submit a copy of passport details. The validity of the travel document has to be one year before the conducts of the training programme.
- ENGLISH LANGUAGE SKILLS:** It is essential that your English language skills are good enough for you to participate in the course.
- COMPUTER SKILLS:** Participants should have a basic competence in using Microsoft Office applications eg. Word, Excel and PowerPoint.

5. **LAPTOP/NOTEBOOK:** Participants are required to bring your own wifi-enabled laptop/notebook computer.
6. **REGISTRATION:** For subsidised participants the acceptance to the training programme is on a first-come, first-served basis and return airline ticket / airfare shall be shouldered by the participant. Method of payment: Cash, Electronic Transfer or Bank Draft.

Duration of the cancellation fee after payment has been processed:

- I. 30 days before the training period: 70% refundable
- II. 15 days before the training period: 50 % refundable

SEAMEO VOCTECH account number and address details:

Account Name - SEAMEO VOCTECH Regional Centre
Account No. - 01-001-001569-00
Bank - Standard Chartered Bank (Main Branch)
Bank Address - 51-55 Jalan Sultan, Bandar Seri Begawan BS8811, Brunei Darussalam
Swift/BIC Code - SCBLBNBB

Please take note:

- All payment should be made **ONE WEEK** before the commencement of the training programme.
- For Electronic Transfer an additional bank charges are to be borne by the participants.
- Please email the transaction slip to training@voctech.edu.bn for our reference.

7. **CERTIFICATE:** Compliance with the requirements of attendance, participation, and submission of course requirements must be observed to be awarded with the Certificate of Completion.
8. All participants of Scholarship/Subsidised recipients are provided with the same level of facilities and share similar responsibilities.
9. Any inquiries, please contact:
Training & Professional Development Division
SEAMEO VOCTECH Regional Centre
Jalan Pasar Baharu, Gadong BE1318
Brunei Darussalam

Tel No. : +673-244-7992
Fax No. : +673-244-7955
Email Address : mimi.jaafar@voctech.edu.bn or training@voctech.edu.bn