

## CONTACT DETAILS

Secretariat  
Science & Engineering Research Centre (SERC)  
Universiti Sains Malaysia, Engineering Campus,  
14300 Nibong Tebal, Seberang Perai South, Penang  
Tel: +604-5996501/6504/6580  
Fax: +604-599 5397  
Email: swam@usm.my

### ACCOMMODATIONS NEAREST TO USM

Melor Inn 05 7176268  
Parit Buntar Inn 05 7173160  
D'Jawi Bella Hotel 04 5832000  
Desasiswa Utama, USM 04 5949235



## 2 DAYS SHORT COURSE ON ANAEROBIC DIGESTION: PROCESS, DESIGN AND APPLICATIONS

23<sup>RD</sup> - 24<sup>TH</sup> MAY 2016\*

### PARTICIPANT DETAILS

NAME:

DESIGNATION:

CONTACT NO:

EMAIL:

STATUS:

PROFESSIONAL  STUDENT

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payment to [swam@usm.my](mailto:swam@usm.my)

# 2 DAYS SHORT COURSE ON ANAEROBIC DIGESTION: PROCESS, DESIGN AND APPLICATIONS

23<sup>RD</sup> - 24<sup>TH</sup> MAY 2016

9.00 am – 5.00 pm

Science & Engineering Research Centre (SERC)  
Universiti Sains Malaysia, Engineering  
Campus, 14300 Nibong Tebal,  
PULAU PINANG

Organized by



SOLID WASTE MANAGEMENT CLUSTER

## INTRODUCTION

Anaerobic digestion (AD) can be defined as a decomposition process of an organic matter by groups of microorganisms in an oxygen-depleted environment. This process is becoming popular nowadays because of its methane recovery potential and the nutrient-rich solids produced after digestion that can be used as a fertilizer. This method offers several potential environmental benefits including: produces biogas and useful fertilizer, reduces the organic content of the wastes, preserving the fertilizer value, eliminate biodegradable components that produces odour, reduces pathogen in the organic waste and reduces greenhouse gas emission (methane and carbon dioxide) which may lead to global warming. Typically, raw biogas comprises of 60% of methane (CH<sub>4</sub>) and another 40% of carbon dioxide (CO<sub>2</sub>), a small amount of hydrogen sulfide (H<sub>2</sub>S) and ammonia (NH<sub>3</sub>).

The utilization of biogas to produce heat, mechanical energy and electrical energy from AD of organic waste is not common in Malaysia. It was reported that utilization of biogas in the country was considered in early 80's and the production of biogas was conducted in a small scale. In Malaysia, the cost of electricity used in every houses and industries is still comparatively low; hence the necessity to produce power through AD is of low priority. However, due to mounting of solid wastes (especially organic wastes generated all over the country and were directly dumped into the landfills, it is possible to convert the wastes into beneficial products; as biogas, electricity, fine chemicals and also a fertilizer that can be obtained at the end of the AD process. Eventhough the energy and power produced from AD might be not enough to be supplied to the houses or industries, it still can be used as a source of electricity in a small reactor or treatment plant in Malaysia. Furthermore, the operation costs can be reduced through utilization of biogas for heat or electricity generation in the plant.

This course will cover the basic theory of AD, the application of AD, design and costing of anaerobic digester, operational and troubleshooting of AD and AD experience in Malaysia.

10 CPD POINTS APPROVED (BEM)

## OBJECTIVES

At the end of this course, participants will be able to:

- understand the situation of solid wastes generation, management and landfill system in Malaysia.
- understand the basic theory of anaerobic digestion (AD) which covers the definition, types, stages, factors affecting the process and waste characterization.
- get familiar with the AD application e.g sequencing batch reactor (SBR), microbial fuel cell and chemical production.
- gain knowledge about the AD experience in Malaysia.
- learn the method on how to design and prepare the costing to build an anaerobic digester.
- handle the operational and trouble shooting of anaerobic digester.

## COURSE CONTENT

1. An overview of solid wastes generation, management and landfill system in Malaysia.
2. Introduction to anaerobic digestion (AD).
3. Characterization of feedstock used in AD process.
4. Anaerobic digestion of municipal solid wastes (MSW).
5. The application of AD includes: sequencing batch reactor (SBR), microbial fuel cell, and chemical production (acetic, butyric and propionic acid).
6. AD experience in Malaysia: AD of slaughterhouse waste, AD of food waste and others.
7. Design and costing of anaerobic digester.
8. Operational and trouble shooting of anaerobic digester.

## COURSE FEES

**RM800 (PROFESSIONALS)**  
**RM500 (STUDENTS)**

- Any registrations that are more than 3 persons from the same organization will get RM100 discounts (Inclusive of 6% GST).
- The course fees include course materials, hand outs, and refreshments.
- Upon completion of the course, participant will be given a certificate.

## PAYMENT DETAILS

Please make your payment to  
**BENDAHARI UNIVERSITI SAINS MALAYSIA,  
KAMPUS KEJURUTERAAN**  
**Account No: 08022010026077,**  
**Bank Islam (M) Berhad**  
and email your proof of payment to the secretariat.

## COURSE SPEAKERS

**DR. MOHD PAUZE BIN MOHAMAD TAHA**  
Director of Research Technology, Industrial & Construction Waste Division  
Perbadanan Pengurusan Sisa Pepejal Dan Pembersihan Awam (PPSPA)

**PROF. IR DR MOHD. OMAR ABD. KADIR**  
School of Industrial Technology, USM  
Expertise: Industrial Wastewater Treatment & Designs

**PROF. DR HAMIDI ABDUL AZIZ**  
School of Civil Engineering, USM  
Expertise: Solid Waste Management

**PROF. DR NORLI ISMAIL**  
School of Industrial Technology, USM  
Expertise: Aerobic and Anaerobic Fermentation

**ASSOC. PROF. DR. MOHD SUFFIAN YUSOFF**  
School of Civil Engineering, USM  
Expertise: Solid Waste Management

**ASSOC PROF. DR. VEL MURUGAN VADIVELU**  
School of Chemical Engineering, USM  
Expertise: Biological Wastewater Treatment Technology (Sequencing Batch Reactor)

**DR HUSNUL AZAN TAJARUDDIN**  
School of Industrial Technology, USM  
Expertise: Fermentation Technology

**DR NASTAEIN QAMARUZ ZAMAN**  
School of Civil Engineering, USM  
Expertise: Anaerobic Digestion

## WHO SHOULD ATTEND?

- Plant managers and plant engineers, environmental staffs of companies that generate wastewater and solid wastes, planners and designers of anaerobic processes, personnel for municipalities.
- Academicians, Postgraduate and Undergraduate research students in the area of anaerobic digestion systems and operation, and environmental engineering.