# International Training Course on
# "Sustainable Waste Management in a Circular Economy"

## Faculty of Environment and Resource Studies
## Mahidol University, Thailand
## 5 - 26 November, 2026

**1. Course Title**:

Sustainable Waste Management in a Circular Economy

**2. Duration**

**5 - 26 November, 2026 (22 Days)**

**3. Background and Rational**

Waste is a global issue. It has strong linkages to a range of other global challenges such as health, climate change, poverty reduction, food and resource security and sustainable production and consumption. Pollution from waste and wastewater is a major problem in the world that impacts many parts of society and the economy. The increasing in population, advanced technology, social and economic development is causing a rise of waste and wastewater. Inappropriate management of waste is an immediate solution to cope with the tremendous amount of waste generated and the consequences of it causes major problem throughout the world. The uncontrolled emission of greenhouse gases from the degradation of organic substances in waste and wastewater such as methane and carbon dioxide is one of the major concerned in global warming issue. The pollutants and toxic substances released from the illegal dumping sites can contaminate the land, groundwater and surface water nearby. Also the plastic waste in the environment can breakdown into microplastics that can harm the aquatic lives and finally harm human health via accumulation of toxic in microplastics through food chain.

A circular economy is an economic system aimed at minimizing waste and making the most of resources. The concept of circular economy is to keep resources in use for as long as possible, extract the maximum value from them while in use, then recover and regenerate products and materials at the end of life. This concept is in contrast to the traditional linear economy which has a 'take, make, dispose' model of production. The circular economy seems intuitive to be more sustainable than the linear economic system. Reducing the resources used, and the waste and leakage created, conserves resources and helps to reduce environmental pollution. The circular economy is an enabler for carbon emissions reduction. The potential of 3R and resource efficiency is in line with the Sufficiency Economy Philosophy (SEP) and the Sustainable Development Goal, SDG 12 Responsible Consumption and Production and SDG 13 Climate Action.

Waste management has been an active area of study, research and teaching of the Faculty of Environment and Resource Studies. Thailand has made large steps in improving the management in the past decade. For these reasons the Faculty of Environment and Resource Studies intends to organize a training program in Sustainable Waste Management in a Circular Economy. This program will provide an understanding of the principles of waste management and emerging issue related to waste management and climate change. The course will rely on the expertise that the Faculty has gained through hands on research and also on the experience of Thailand over the last decade in tackling this issue. State of the art waste management and

wastewater treatment techniques will be disseminated and the current challenges faced will also be debated. It is expected that this program based on practical experiences in Thailand will be of use to participants in the future.

## 4. Objectives

4.1 To introduce the concepts and principles knowledge of municipal solid waste management and treatment technologies

4.2 To enhance practical knowledge, technology and skills via the practice in the lab, workshop and site visits

4.3 To apply the concept of circular economy and sufficiency economy through waste management

## 5. Course Contents

### 5.1 Course Outline

1) Sustainable Waste Management and Circular Economy
2) Industrial Waste Management in a Circular Economy
3) 3Rs in a Circular Economy and Self-Sufficiency Economy
4) Thermal Treatment of Waste and WTE (Gasification, Pyrolysis and Incineration)
5) Biological Treatment of Waste: Composting
6) Waste Disposal in Landfill
7) Illegal Dumping/Discharge: Investigation and Remediation
8) Infectious waste and COVID-19 pandemic: Lesson learned
9) Plastic Waste: Marine Debris and Microplastics
10) Overview of wastewater treatment/ wastewater collection system
11) Central Wastewater Treatment System for Urban Area (Activated Sludge/ Oxidation Ditch/RBC)
12) WTE: Sludge/ organic waste digestion in anaerobic process/ biogas utilization for energy in small scale
13) Landfill Mining and old dumpsite recovery
14) E-Waste: Responsible Consumption and Production and E-Waste Trafficking
15) Construction and Demolition Waste Management in a Circular Economy and Disaster Waste Management
16) GIS Application for Waste Management
17) Food Waste: Prevention and Recycling
18) Waste and Climate Change
19) Waste Management for Tourism

### 5.3 Study Trips/Field Trips

**One-day field trip + Three-day field trip + Salaya Site Visit**

1) One-day field trip at WTE and Nontaburi Site/Night soil, compostion, Landfill, Infectious Incinerator
2) Three-day field trip: EEC: Cha Chengsao, Chonburi and Rayong provinces to visit waste management in EEC area and Marine Debris Survey
3) Site visit 1: Waste Bank Salaya and Composting Facility Salaya

**5.4 Advance Assignments**

1) Country Report:

1.1 General information of participant (1 page of A4 size paper) including; Name of participant, Educational background, Country, Name of Organization, Participant's position, Duties and responsibilities (Briefly)

1.2 General information of the Country (1-2 page of A4 size paper) including; Geographical status of the country, Climate, Population, Official language, Social, Educational and
Economic conditions, Gross National Products (GNP), Per- capita Income, Major import and export goods, Natural resources and environmental situation, etc.

1.3 Content (up to 4-5 pages of A4 size paper): The detail in your country report should cover with the following topics.

a) The current situation on Waste Management and circular economy in your country
b) Country policy related to Waste management
c) The best available technologies/ practices related to Waste recycling, treatment, and disposal processes

1.4 Lessons learned from past practices of Waste management

1.5 Summary and Recommendation (1 page of A4 size paper)

1.5 References and further information (If any) (1 page of A4 size paper)

1.6 Submission date: No later than **15 October, 2026**

**6. Participant Criteria**

- Age: Less than 40 years old
- Work experience in related fields: More than 2 years
- Education: Equivalent to Bachelor Degree or higher
- Language: Good communication in English

**7. Venue**

Faculty of Environment and Resource Studies, Mahidol University
Accommodation: 1. Salaya One Hotel
2. Hotel at field trip sites as schedule appropriate

**8. Expecting Results**

Expected key results for participants after completion of the training course:

- Basic knowledge of waste management and circular economy
- Meaningful information about advanced technology for reuse, recycle, treatment and disposal related to various type of waste and emerging issue of waste in Thailand and participants' countries
- Better understanding of further applications through workshops and field trips
- Information about current Laws, Regulations and Policies of waste management in Thailand and participants' countries
- Understand the emerging issues of waste and its impacts and know how to tackle with the coming problems.

**9. Evaluation**

- No paper examination after completing this training course
- Participants must attend the class no less than 80% of the total training period

- Participants must submit their country reports 1 week before the country report presentation and every participant must present their reports.

## 10. Institution

### 10.1 Executing/Implementation Agency

- Implementation organization:
  Faculty of Environment and Resource Studies, Mahidol University
- Staff availability:
  20 Lecturers will participate in this training.
  30 Supporting staff will be in charge in this training.
- Training materials:
  Handouts, CDs and other documents related to course topics will be given/ available to participants.
- Equipment:
  Computers, printers, LCD, media equipment and laboratory equipment are available
- Other facilities:
  Phone, fax and internet access are available
- Accommodation:
  Salaya One Hotel
- Address:
  999 Phuttamonthon 4 Rd., Salaya, Phuttamonthon, Nakhon Pathom 73170
- Course Leader:
  Dean of Faculty of Environment and Resource Studies
- Course Director:
  Asst. Prof. Dr. Achara Ussawarujikulchai
- Contact Person:
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**11**. (**Draft**) **Schedule**

| Time | Activities | |
|---|---|---|
| **Thursday 5 November, 2026** | | |
| 09:00 – 09:30<br>09:45 – 10:45 | Registration<br>**Opening ceremony**<br>▯ Audio Visual Presentation<br>Faculty of Environment and Resource Studies<br>▯ Welcoming speech by Dean of the Faculty of Environment and Resource Studies<br>▯ Course Introduction, Course Syllabus & Programme, Instructors, Assistants, Logistics by Asst. Prof. Dr. Achara Ussawarujikulchai<br>▯ Introduction to academic and supporting staff<br>▯ Participants introduce themselves<br>▯ Group photo | |
| 10:45 – 11:30 | **Salaya Campus Tour** | |
| **Time** | **Topic** | **Instructor** |
| 13:00 – 16:00 | **Topic 1**: Sustainable Waste Management and Circular Economy | |
| 17:30 – 19:00 | **Welcoming Dinner** | All lecturers and staff |
| **Friday 6 November, 2026** | | |
| 09:00 – 12:00 | **Topic 2**: Industrial Waste Management in a Circular Economy | |
| 12:00 – 13:00 | Lunch | |
| 13:00 – 16:00 | **Topic 3**: 3Rs in a Circular Economy and Self-Sufficiency Economy | |
| **Saturday 7 November, 2026** | | |
| **Social and cultural activities**: | | |
| **Sunday 8 November, 2026** | | |
| **Social and cultural activities**: | | |
| **Monday 9 November, 2026** | | |
| 09:00 – 12:00 | **Topic 4**: Thermal Treatment of Waste and WTE (Gasification, Pyrolysis and Incineration) | |
| 12:00 – 13:00 | Lunch | |
| 13:00 – 16:00 | **Topic 5**: Biological Treatment of Waste: Composting | |

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| **Tuesday 10 November, 2026** | | |
| 09:00 – 12:00 | **Topic 6**: Waste Disposal in Landfill | |
| 12:00 – 13:00 | Lunch | |
| 13:00 – 16:00 | **Topic 7**: Illegal Dumping/Discharge: Investigation and Remediation | |
| **Wednesday 11 November, 2026** | | |
| 09:00 – 12:00 | **Topic 8**: Infectious waste and COVID-19 pandemic: Lesson learned | |
| 12:00 – 13:00 | Lunch | |
| 13:00 – 16:00 | **Topic 9**: Plastic Waste: Marine Debris and Microplastics | |
| **Thursday 12 November, 2026** | | |
| 07:00 – 16:00 | **Field trip 1**: **One-day field trip**<br>WTE and Nontaburi Site/Night soil, compostion, Landfill, Infectious Incinerator | Lecturers and Staff |
| **Friday 13 November, 2026** | | |
| 09:00 – 12:00 | **Topic 10**: Overview of wastewater treatment/ wastewater collection system | |
| 12:00 – 13:00 | Lunch | |
| 13:00 – 16:00 | **Topic 11**: Central Wastewater Treatment System for Urban Area (Activated Sludge/ Oxidation Ditch/RBC) | |
| **Saturday 14 November, 2026** | | |
| **Social and cultural activities**: | | |
| **Sunday 15 November, 2026** | | |
| **Social and cultural activities**: | | |
| **Monday 16 November, 2026** | | |
| 09:00 – 12:00 | **Topic 12**: WTE: Sludge/ organic waste digestion in anaerobic process/ biogas utilization for energy in small scale and On-Site/Individual Wastewater Treatment System/WWT System for Rural Area (Septic Tank) | |
| 12:00 – 13:00 | Lunch | |
| 13:00 – 16:00 | **Topic 13**: Landfill Mining and old dumpsite recovery | |

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| **17-19 November, 2026** | | |
| 07:00 – 16:00 | **Field trip 3**: **Three-day field trip**<br>Option 1) Chonburi/Rayong<br>Option 2) Petchburi/Prachuabkirikan<br><br>Field work or Workshop in Trip 3 to sample plastic waste on the beach collect sample of Meso and microplastic on the beach | Lecturers and Staff |
| **Friday 20 November, 2026** | | |
| 09:00 – 12:00 | **Topic 14**: E-Waste: Responsible Consumption and Production and E-Waste Trafficking | |
| 12:00 – 13:00 | Lunch | |
| 13:00 – 16:00 | **Topic 15**: Construction and Demolition Waste Management in a Circular Economy and Disaster Waste Management | |
| **Saturday 21 November, 2026** | | |
| **Social and cultural activities**: | | |
| **Sunday 22 November, 2026** | | |
| **Social and cultural activities**: | | |
| **Monday 23 November, 2026** | | |
| 09:00 – 12:00 | **Topic 16**: GIS Application for Waste Management | |
| 12:00 – 13:00 | Lunch | |
| 13:00 – 16:00 | **Topic 17**: Food Waste Management | |
| **Tuesday 24 November, 2026** | | |
| 09:00 – 12:00 | **Topic 18**: Waste and Climate Change | |
| 12:00 – 13:00 | Lunch | |
| 13:00 – 16:00 | **Site visit 1**: **Waste Bank Salaya and Composting plant salaya** | |
| **Wednesday 25 November, 2026** | | |
| 09:00 – 12:00 | **Country Report Presentation 1** | |
| 12:00 – 13:00 | Lunch | |
| 13:00 – 16:00 | **Country Report Presentation 2** | |
| **Thursday 26 November, 2026** | | |
| 09:00 – 12:00 | **Country Report Presentation 3** | |
| 12:00 – 13:30 | Lunch | |

| Time | Activities |
|---|---|
| 13:30 – 14:30 | **Closing Ceremony**<br>▯ Report by Course Director, Faculty of Environment and Resource Studies<br>▯ Speech by Director of Thailand International Cooperation Agency (TICA)<br>▯ Certificate presentation and closing speech by the President of Mahidol University<br>Group photo |