

Proposed Course Outline

Length: 2 days

Part 1: Introduction to Plasma (3hrs)

- Basics of Plasma

This topic will focus on the definition of plasma and its sources. The classification of plasma, whether natural or artificial plasma, will also be tackled. The different reactive gaseous species in a plasma will also be shown.

- Principle of Plasma Generation

This topic will highlight the different conditions to generate plasma in a laboratory setting. The different vacuum and non-vacuum requirements will be presented and the common gases used to generate reactive species. Basic diagnostic tools such as optical spectroscopy will also be discussed to describe the generated plasma.

- Plasma Technology in the Philippines

A quick history of how plasma technology started in the Philippines in the 1980s, developments through the years, challenges and solutions in the field in the Philippine setting. Schematics, actual systems, and applications will be discussed.

Part 2: Industrial Applications of Plasma (3hrs)

- Plasma for material synthesis and modification

This topic will cover relevant plasma processes done in various pressure levels, from atmospheric pressure to high vacuum pressure. The different effects of the plasma processes (ablation, crosslinking, etc) will be discussed together with the surface treatment of polymeric materials. Relevant studies which also uses plasma technology will also be discussed

- Practical applications of plasma in industrial processes

This topic will present the current application of magnetron sputtering and PECVD in the industrial process in the Philippines. The presentation will focus on the applications of these technologies in the Philippines.

- Upscaling plasma technology for industrial applications

This topic will highlight the recent development and challenges of setting up magnetron sputtering from laboratory scale to production scale.

Part 3: Role of Plasma in a Health Crisis (2hrs)

- Uses of plasma in the biomedical field

This topic will focus on plasma research studies such as surface sterilization, biocompatibility, improved tissue regeneration, wound healing, adhesion and protein adsorption. This topic will also show current efforts of plasma research (utilization of technologies such as dielectric barrier discharge and RF plasma sputtering) in the Philippines on biomedical application.

- Contributions of plasma in public health emergency

This topic aims to show how plasma technology (such as microwave plasma and atmospheric pressure plasma) can be used to prepare and aid the health sector in dealing with health crises such as the recent COVID-19 pandemic. This part will also aim to present recent efforts in utilizing these technologies in the health settings in the Philippines.

Part 4: Perspectives on Plasma Technology in Disaster Preparedness and Mitigation (1 hr)

This topic aims to present possible contributions of plasma technology in disaster preparedness. The studies to be presented may be focused on the device fabrication or modifications of existing devices used in the data gathering. This topic may also feature recent development of using plasma technology in the analysis of water contamination in the Philippines.

Goals of the Course:

This multidisciplinary technical training course will be offered to students (both graduate and undergraduate levels), engineers, researchers and professionals in the academe and relevant industries. Aside from Filipinos, we also plan to invite interested individuals in the South East

Asian region. This course aims to widen the knowledge and understanding of participants on the different concepts of plasma technology and its practical applications, especially in the biomedical field. This course will also show how plasma technology will be used for disaster preparedness. This course will help establish collaboration among the speakers and participants especially in the ASEAN region. We also plan to partner with relevant professional and scientific organizations to reach out to more participants from different disciplines. At the end of this course, the participants will be receiving a certificate of participation from the Vacuum Society of the Philippines after they have accomplished the survey form and required evaluation activity.

Tentative List of Speakers

The following are the prospective resource person for the proposed technical training course. Additional speakers may be included throughout if there are resource persons to be suggested by other members of the society.

Name	Affiliation
Magdaleno Vasquez Jr.	University of the Philippines-Diliman
Christian Laurenz Mahinay	Ateneo De Manila University
Hernando Salapare III	Université Côte d'Azur
Michelle Villamayor	Linköping University
Ivan Culaba	Ateneo De Manila University
Kathrina Lois Taaca	University of the Philippines-Diliman
Catherine Joy Dela Cruz	Ateneo De Manila University
Alex Mendenilla	Sunpower Philippines Limited

Invited speakers are also welcome to present in the proposed technical training course