Nanotechnology for Green Energy

Training Course	Nanotechnology for Green Energy
Course Language	English
Course Duration	Total Number of hours: 15 hour
Course Objectives	• Educate participants on the fundamental concepts of nanotechnology, preparation methods characterization. • Provide experimental procedures for nanotechnology and green energy. • Explore the practical implementation of nanomaterials for renewable energy applications. • Showcase how nanotechnology is applied in key areas such as green hydrogen, batteries, supercapacitors, fuel cells, and environmental remediation. • Bridge the gap between scientific principles and industrial applications.
Course Content	Course Key Topic Area Includes: Module 1: Introduction to Nanotechnology Module 2: Nanotechnology and Green Energy Challenges Module 3: Utilization of Nanomaterials for green energy production and storage Module 4: Nanotechnology for a Clean Environment Module 5: Scale-Up and Future Perspectives
Learning Outcomes	At the end of the program the trainees will be able to: • Describe the fundamental principles of Nanotechnology • Explain how different nanomaterials (e.g., inorganic, organic, graphene, nanocarbons) are synthesized and characterized, and applied to improve energy technologies. • Analyze and compare the performance of various green energy production, conversion, and storage technologies(e.g., green hydrogen, batteries, supercapacitors, and fuel cells from a nanotechnology perspective • Evaluate the potential and limitations of nanotechnology for solving energy challenges. • Identify current and future trends in the application of nanomaterials for a sustainable energy future, on both lab-scale and industrial-scale.

Target Audience	This course is designed for a broad and multidisciplinary audience, including: • The General Public: Individuals interested in understanding the science and technology behind the nanotechnology and green energy transition. • Students: Undergraduate and graduate students in fields such as physics, chemistry, materials science, engineering, and environmental science who want to specialize in either nanotechnology or green energy. • Young Engineers: Early-career engineers seeking to upskill and enter the environmental and renewable energy sector. • Industry Professionals: Engineers, researchers, and managers from the energy, materials, and manufacturing sectors who wish to understand the latest advancements and potential applications of nanotechnology. • The course connects fundamental nanoscience with industrial applications. It is thoughtfully designed to be accessible to students, engineers, decision-makers, and newcomers in STEM fields, while also providing significant technical depth, real-world data, and forward-looking challenges to engage practicing engineers and industry leaders.
Instructor Details & Brief Instructor	Name: Kamel Eid Title/Dept: Research Assistant professor Email: Kamel.eid@qu.edu.qa
Biography	Dr. Kamel Eid is a research assistant professor at the Gas Processing Center (GPC), College of Engineering, Qatar University, and holds a Ph.D. in analytical chemistry from the Chinese Academy of Sciences in China. He collaborated with the National Institute for Materials Science (NIMS) in Japan, supported by a scholarship from TWAS-UCAS, and was the first among 140 international students to graduate from this program. He has worked at several universities, including the American University in Cairo, the Changchun Institute of Applied Chemistry, and Zhejiang University of Technology in China, before joining Qatar University. He has published over 130 research papers in reputable international journals, achieving an overall H-index of 58 (ScholarGPS) and over 7,800 citations, in addition to filing 15 US patents and authoring one book published by RSC London. Consequently, he is ranked among the world's top 2% of scientists in nanotechnology according to Stanford/Elsevier. He is also highly cited and ranked in the world's top 0.31% of scientists in nanostructures based on ScholarGPS. His research focuses on developing nanosystems aimed at generating clean energy through electrochemical reactions, such as fuel cells and water electrolysis.