



UNIVERSITY OF NAIROBI

DEPARTMENT OF PHYSICS

## SOLAR ACADEMY PROGRAMME



*Capacity Building for Clean Energy Production*

The Department of Physics, University of Nairobi offers a short professional course in design, installation and maintenance of Solar PV systems

The training program is held twice a year in the holiday months of April and August and runs for two weeks. Advertisement for the training is usually posted in newspapers in the months of March and June for April and August series respectively.

### TARGET GROUPS

The training prepares one for accreditation by NITA and Licensing by ERC to practice as a pv installer and/or contractor, vendor importer or manufacturer according to the ERC Solar PV Licensing Regulations 2012.

The training is ideal for groups or individuals from government, public or private institutions, electrical installation technicians, solar pv vendors, teachers, technical institute tutors and final year university or diploma students.

### ENTRY REQUIREMENTS

To qualify for the training, one must have at least KCSE plus Diploma in Electrical and/or Electronics or BSc Electrical Engineering or Higher National Diploma in Electronics or in a relevant area. Those who have been practicing installation or retailing of PV systems for at least 2 years are also considered for the training.

### COURSE CONTENT

**Basics of Solar Electricity** (solar radiation principles, measurement)

**Introduction to Photovoltaics** (PV components, benefits, limitations, technology)

**Solar cell/ Module Characterization** (current-voltage measurement, effect of shading, temperature, connection modes)

**PV system configurations and Mounting** (DC, AC/DC stand alone, grid connect, pv power plants)

Storage batteries (technologies, installation, connection, choice of batteries)

**Power conditioning** (charge controller & inverter functions, technologies & criteria for choice)

**PV Appliances** (types of appliances & their technologies: lighting, TV, radio, refrigeration, communication, security, water pumping)

**PV wiring** (cable specifications, voltage drop, types of wiring, wiring diagrams, wire standards)

**PV System sizing** (daily energy demand, system voltage, size of modules, batteries, controllers, cable sizing)

**PV system design, installation & commissioning** (planning, safety, installation steps, system check & tests: earth rod resistance, RCD, continuity, user training)

**PV System maintenance** (components maintenance, troubleshooting, records)

**Solar Lanterns** (technologies, principles, standards, markets, cost benefit analysis)

**Entrepreneurship in PV** (PV market in Kenya, PV payback period, constraints, policy)

## PROGRAMME

WEEK ONE	
DAY	SESSION
DAY 1	Introduction to PV
	Solar Module Characteristics
	System mounting
	Storage batteries
DAY 2	Charge controller
	Inverters
	PV appliances
	PV Wiring
DAY 3	Module Characteristics Practical
DAY 4	Module Characteristics Practical
DAY 5	PV System Sizing
	PV System Sizing Practical
	Group Presentations
WEEK TWO	
DAY 6	PV installation & commissioning
	PV maintenance
	Inverters Practical
	PV Lanterns
DAY 7	Installation & commissioning Practical
DAY 8	Installation & commissioning Practical
	Group & individual assessment
DAY 9	Entrepreneurship in PV
	Discussions



Model Set-up for Module Analysis

## CAREER PROSPECTS

The main goal for the training is capacity building in PV installation such that those trained will acquire the required competence and skills for carrying out quality, safe and reliable pv systems. This will enable one to be licensed by ERC and therefore have high prospects of being employed in pv subsector or run own entity as a contractor, vendor or manufacturer. For students, the department has Bachelors and Master programs that cover solar energy which interested students can enroll.



## TRAINING FACILITIES

The department possesses a well-equipped Solar Energy and Electronics laboratories that are directly involved in the training. The training equipment available is pv modules, controllers and inverters of different technologies; modern solar trainer kit that comprises pv analyzer, pv simulator, solar pathfinder, pyranometers, RCD test tools, continuity and earth resistance test tools etc.

## FEES

The course duration is 9 days full time. The cost for the training is KShs. 42,000/- per person for Kenyans or USD 500 for non-Kenyans which covers training materials, lunch and teas. Participants are expected to arrange for their own accommodation near the training venue. The above fees are subject to change.

## HOW TO APPLY

Applications are open throughout the year. Application forms are available online at <http://physics.uonbi.ac.ke/> or at the Department of Physics. A non-refundable application fee of **K.Shs. 1000/-** (or USD 20) is charged and together with the training fees are payable to **Industrial Electronics Unit (UoN), Barclays Bank Westlands Branch, Acc. No. 073-1264775**. Duly completed forms and bank deposit slip should be returned to the Department of Physics or can also be scanned and emailed to [physics@uonbi.ac.ke](mailto:physics@uonbi.ac.ke) to be received before the set deadline for the particular training as per the advertisement.

*For Further enquiries please Contact Chairman, Department of Physics, Chiromo Campus, Tel 020-4447552, 020-4449616 email: [physics@uonbi.ac.ke](mailto:physics@uonbi.ac.ke), [solaracademy@uonbi.ac.ke](mailto:solaracademy@uonbi.ac.ke), website: <http://physics.uonbi.ac.ke>*