**20EE22S1-BASICS OF PV SYSTEM INSTALLATION**

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| **Course category:** | Professional core | **Credits:** | 2 |
| **Course Type:** | Skill oriented course | **Lecture - Tutorial - Practical:** | 1 - 0 - 2 |
| **Pre-requisite:** | Electrical circuits | **Sessional Evaluation :**  **Univ.Exam Evaluation:**  **Total Marks:** | 40  60  100 |

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| **Course Objectives** | Students undergoing this course are expected to learn: | |
| 1.The basics of electricity related to photo-voltaics.  2.The different types of protective clothing and equipment  3.About the functions of the system components  4.The requirements for photovoltaic system installation on different surfaces  5.Installation of photovoltaic system components and systems  6.About the procedure for maintaining different PV system components. | |
| **Course Outcomes** | Upon successful completion of the course , the students will be able to: | |
| **CO1** | Explain the basics of electricity related to photo-voltaics |
| **CO2** | Identify the different types of protective clothing and equipment |
| **CO3** | Explain the functions of the system components |
| **CO4** | Understand and explain the requirements for photovoltaic system installation  on different surfaces |
| **CO5** | Install photovoltaic system components and systems |
| **CO6** | Outline the procedure for maintaining different PV system components |
| **Course Content** | **UNIT-I**  **Introduction to solar photo-voltaics:** The photovoltaic effect , Photovoltaic technology and solar cells, Photovoltaic system configuration, Applications for solar photovoltaic systems  **UNIT-II**  **Workplace safety and first aid:** Risks and hazards, Site safety, Personnel safety, Working at rooftops and facades, Fire hazards, First aid. | |

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|  | **UNIT III**  **Components and electrical connections:** Basics ofSolar photovoltaic modules, Inverters, Batteries, Charge controllers, Protective measures, Sizing a PV system.  **UNIT-IV**  **Site preparations:** Taking measurements, Shade analysis ,Orientation of photovoltaic modules, Installation surfaces, Planning work schedules.  **UNIT-V**  **Installing a solar photovoltaic system:** Required tools and equipment, Installing the photovoltaic array, Installing the battery bank, Installing the charge controller, Installing the inverter, Connecting the system components, Commissioning, **PV panel earthing.**  **UNIT-VI**  **Maintenance and troubleshooting:** Maintenance of solar panels, TroubleshootingPV system. |
| **Text Books and Reference Books** | **TEXT BOOKS:**   1. Photovoltaic design and installation for dummies, Wiley Publishing Inc. 2. Planning and installing photovoltaic systems:A guide for installers ,engineers and architects Earth scan   **REFERENCE BOOKS:**   1. Solar photovoltaic systems technical training manual • UNESCO 2. Renewable energy resources • John Tidwell and Tony Weir. |
| **E- Resources** | 1. [www.mfs.fireextinguishers.co.uk](http://www.mfs.fireextinguishers.co.uk) 2. <https://hespv.ca/solar-resources/solar-installer-tools/solar-training-videos> 3. https://www.solarenergy.org/online/ |