

### COURSE PLAN

Course Title	Solar PV Design Module 1 – Introduction to solar PV design				
Course duration	4 days				
Course Fee	RM2,500.00				
Re-sit fee	RM300.00				
Passing mark	90% and above				
Course Status	Core				
Prerequisite	No prerequisite				
Entry requirement	At least Bachelor of Engineering, Bachelor of Technology or Diploma in Engineering/ Technology with at least 1 year of experience in solar PV installation/design.				
Synopsis	This course explores the essential knowledge in designing solar PV systems for both grid-connected and off-grid solar PV design. It includes the basic physics of solar PV modules and fundamental solar engineering.				
Course Outcomes (CO)	By the end of this course, students should be able to:				
			Level of Domain		
			C	P	A
	CO1	Interpret the solar path chart	3		
	CO2	Quantify the effect of shading during the site assessment	3		
	CO3	Estimate the current and voltage of PV array during real operating condition	3		
	CO4	Design of Lightning Protection based on the Class of Protection	3		

*C: Cognitive ; P: Psychomotor ; A: Affective ; S: Soft-skills (CT: Critical Thinking)*

Day	Topics	Teaching Activities	Assessment/Evaluation Method
1	<b>INTRODUCTION</b> <ul style="list-style-type: none"> <li>• Electrical Engineering Fundamental</li> <li>• PV Modules and Technology</li> <li>• Geographical Coordinate System</li> <li>• Basic Solar Engineering</li> <li>• Notion of Solar Time</li> <li>• Solar Angle</li> </ul>	Lecture	Test / Final Assessment
2	<b>PRE-DESIGN</b> <ul style="list-style-type: none"> <li>• Site Assessment</li> <li>• Solar Instruments</li> <li>• Balance of System</li> <li>• Safety</li> <li>• Sarawak NEM Scheme</li> <li>• Generating License Application</li> <li>• Single Line Drawing</li> <li>• Lightning and Protection</li> </ul>	Lecture	Test / Final Assessment
3	<b>TUTORIAL SESSION</b> <ul style="list-style-type: none"> <li>• Case Study</li> <li>• Tutorial covering topics in Day 1 and 2</li> </ul>	Tutorial	Test / Final Assessment
4	<b>TEST</b> <ul style="list-style-type: none"> <li>• Final Assessment</li> <li>• Report Submission (after 1 week)</li> </ul>	Test	Test / Final Assessment

Teaching - Learning Approach	Hours per modules	
	Lectures	16
	Tutorial	8
	Laboratory/Practical	
	Test	3
Student-Centered Learning	13	

	(Teamwork, Reading, Guided Assignments, Practices/Discussion, etc.)	
	<b>Total</b>	<b>40</b>
Assessment		Percentage
	Final Exam	95
	Site Visit Report	5
	<b>Total</b>	<b>100</b>
Resources	<ol style="list-style-type: none"> <li>1. SEDA Malaysia Grid Connected Photovoltaic System Design Course, 2<sup>nd</sup> edition, 2016</li> <li>2. Majid Jamil, M Rizwan, D P Kothari, Grid integration of Solar Photovoltaic System, CRC Press, Taylor and Francis, 2018</li> <li>3. G N Tiwari, Arvind Tiwari, Handbook of Solar Energy, Theory, Analysis and Application, Springer, 2016</li> <li>4. Malaysian Standard MS1837:2010 Installation of Grid Connected Photovoltaic (PV) System, 2010</li> </ol>	
Prepared by:  ..... Ir. Dr Hazrul bin Mohamed Basri  Date: .....	Moderated by :  ..... Ir. Dr Kasumawati binti Lias  Date: .....	Moderated by :  ..... Prof. Dr Wan Azlan bin Wan Zainal Abidin  Date: .....
Checked and certified by:  ..... Assoc. Prof Ir. Ts. Dr. Kismet Anak Hong Ping (Head, Department of Electrical and Electronic)  Date:.....	Approved by:  ..... (EIU Representative)  Date:.....	