

Accredited by NAAC with 'B+' Grade, 2(f) & 12B Status Institution by UGC

IG Valley, Madurai Main Road, Manikandam, Tiruchirappalli - 620012

# **NAAC DOCUMENTS**

**QUALITY INDICATOR FRAME WORK** 

**CRITERION – 1** 

## **CURRICULAR ASPECTS**

SUBMITTED BY

**IQAC** 

INTERNAL QUALITY ASSURANCE CELL INDRA GANESAN COLLEGE OF ENGINEERING





#### DEPARTMENT OF ELECTRICAL AND ELECTRINICE ENGINEERING

#### ACADEMIC YEAR 2020-2021 / EVEN SEMESTER

#### 1.2 Academic Flexibility (30)

1.2.1 Number of Certificate/Value added courses offered and online courses of MOOCs, SWAYAM, NPTEL etc. (where the students of the institution have enrolled and successfully completed during the last five years)

#### AND

1.2.2 Percentage of students enrolled in Certificate/ Value added courses and also completed online courses of MOOCs, SWAYAM, NPTEL etc. as against the total number of students during the last five years

VAC Title:	SOLA	AR PH	IOTOVOLTAI	C S	YSTE	M I	DESIGN				
Resource Per	rson:		S.SRIDHAR Trainer, Micro win A Trichy-62121	utoi	mation	,					
Date of cond	uct fro	m:	09.08.2021		To:	13	3.08.2021		<b>Duration:</b>	30 Hours	
Organized D	epartm	ent:	ELECTRICA	LA	ND E	LE	CTRINIC	E EN	GINEERIN	iG	
Participant Y	Zear:	EEE	- IV, III, II	Se	mester	:	EVEN	No.	of Students 1	Registered:	46
Venue: G	OOGL	E ME	ET								

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# Department of Electrical and Electronics Engineering Academic Year 2020-2021 -Even Semester

04.08.2021

#### DEPARTMENT CIRCULAR

Department of Electrical and Electronics Engineering and IQAC of IGCE in association with Micro win Automation is going to organize Value Added Course for all Second, Third and Final year students on "Solar Photovoltaic System Design" from 09.08.2021 to 13.08.2021. Certificates will be issued to the eligible participants at the end of the Course. This training will be conducted through online mode.

Resource Person Detail

S.Sridhar,
 Trainer,
 Micro win Automation,
 Trichy-621216

Online Mode

Google Meet

Gr. Ma latta: HOD/EEE Principal

Cc:

- Principal Table
- IQAC Co-Ordinator
- Class In charges II, III & IV-Year
- II, III & IV-Year EEE Students
- Office File
- Notice Board

Dr. G. Balakrishnan, M.E., Ph.D.,

**Principal** 

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.





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# Value Added Course

"Solar Photo Voltaic System Design"

#### **SYLLABUS**

s.no	TOPIC COVERED	DURATION (in hours)	DATE
1	The PV Cell	3	09.08.2021
2	Series And Parallel Interconnection	3	09.08.2021
3	Energy From Sun	3	10.08.2021
4	Incident Energy Estimation	3	10.08.2021
	Sizing PV	3	11.08.2021
	Maximum Power Point Tracking	3	11.08.2021
7	MPPT Algorithms	3	12.08.2021
	PV-Battery Interfaces	3	12.08.2021
9	Peltier Cooling  PV And Water Pumping	3	13.08.2021
10	PV-Grid Interface-I, Life Cycle Costing	3	13.08.2021
11	Exam	1	13.08.202
11	Total Hours (Excluding test)	30	•

Jehn Ferifac VAC Coordinator G. Ma lathi

Dr. G. Balakrishnan, M.E., Ph.D., Principal

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandarn, Trichy-620 012.



# Indra Ganesan



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)r. G. Balakrishnan, M.E., Ph.D.,

ndra Ganesan College of Engineering
IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

### Value Added Course

"Solar Photo Voltaic System Design"

## STUDENTS PARTICIPATION LIST

NO.	Register Number	Name
1	811217105005	ARUL JOY ASHA A
2	811217105006	ARUN SEBASTIN P
3	811217105007	BHARTHASARATHI M
4	811217105008	CHITHRA P
5	811217105009	DEEPIKA G
6	811217105010	EZHUMALAJ A
7	811217105011	GAYATHRI K
8	811217105012	GAYATHRI S
9	811217105013	KANIMOZHI S
10	811217105014	KEERTHANA S
11	811217105015	KUMARIVALLIT
12	811217105016	MADHUMITHA S
13	811217105017	MANO K
14	811217105018	MEKALA M
15	811217105020	PAVITHRA S
16	811217105021	PRAVEEN RAJ R
17	811217105022	RAJASEKAR.N V
18	811217105023	REVATHI P
19	811217105024	RISHON GURU M
20	811217105026	SANTHOSH K
21	811217105027	SRIKUMAR M S



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\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			Name
	S.NO	Register Number	
r. G. Balakrishnan, M.E., Ph. Principal	D. 22	811217105028	SRI LOGESH C
dra Ganesan College of Engineeri IG Valley, Madurai Main Road	ng 23	811217105029	SUBHA T
Manikandam, Trichy-620 012.	24	811217105031	VALARMATHI C
	25	811217105032	VISWANATH R
	26	811217105301	SANJEEV KUMAR R
	27	811218105001	ARUN PRAVEEN RAJ A
	28	811218105002	HARIHARAN M
	29	811218105003	INBARAJ A
	30	811218105004	JEYA STEPHEN S
	31	811218105005	MANIKANDAN N
	32	811218105006	PADMANABAN A
	33	811218105007	SASIKUMAR R
	34	811218105008	SIVAKUMAR P
	35	811218105009	VEERA RAGAVAN A
	36	811218105010	YUVARAJ S
	37	811219105002	M.BARATH
	38	811219105003	A.MANIKANDAN
	39	811219105005	C.PONNALAGU
	40	811219105006	A.SALAMON
	41	811219105007	M.SARAVANAKUMAR
	42	811219105008	K.SOLAIMATHI
	43	813919105001	P.DHEVENTHIRAN
	44	811219105301	A. VENKATRAMAN

Gr. Ma latter HOD/EEE



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# **Department of Electrical and Electronics Engineering**

Academic Year 2020-2021 - Even Semester

# STUDENTS ATTENDANCE LIST

"Solar Photo Voltaic System Design"

Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road

ndam, Ti	ichy-620 012.	- And	and the second s	09.08	2021	10.08	.2021	11.08	.2021	12.08	.2021	13.08	.2021	NO OF SESSIONS	SIGNATUR OF THE
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1	811217105005	ARUL JOY ASHA A	IV/EEE	<u>P</u>	P	- Campang Street Advances	P	P	P	P	P	P	P	10	7
2	811217105006	ARUN SEBASTIN P	IV/EEE	P	P	P	P	P	A	P	P	P	P	9	
3	811217105007	BHARTHASARATHI M	IV/EEE	P	P	P	1	P	P	P	P	P	P	9	
4	811217105008	CHITHRA P	IV/EEE	P	P	P	P	P	P	P	A	P	P	9	*****
5	811217105009	DEEPIKA G	IV/EEE	P	P	P	$\frac{1}{P}$	P	P	A	P	P	P	9	
6	811217105010	EZHUMALAI A	IV/EEE	P	P	P	P	P	p	P	P	P	P	10	
7	811217105011	GAYATHRI K	IV/EEE	P	P	P	P	$+\frac{1}{P}$	A	P	P	P	P	9	- ONLINI
8	811217105012	GAYATHRI S	IN/EEE	P	P		P	P	P	P	A	P	P	9	
9	811217105013	,100 also per 1990 also per 19	IV/EEE	P	P	P	P	P	A	P	P	P	P	9	
10	811217105014		IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
11	811217105015		IV/EEE	P	P	P	P	P	P	P	P	P	P	9	
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Dr. G. Balakrishnan, M.E., Ph.B.,
Principal
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IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.



# Indra Ganesan

## COLLEGE OF ENGINEERING

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21	811217105027	SRIKUMAR M S	IV/EEE	P	P	P	P	A	A	P	P	P	P	9	
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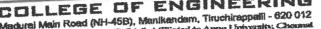
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Dr. G. Balakrishnan, M.E., Ph.D., Principal

Indra Ganesan College of Engineering IG Valley, Madurai Main Road Manikandam, Trichy-620 912.

Gr. Ma lath









Name of the Student:

Year/Sem:

AU Register Number:

# Value Added Course

"Solar Photovoltaic System Design"

## MILTIPLE CHOICE OUESTIONS (25X1 = 25 Marks)

MULTIPLE CHOICE QUESTIONS (25X1 = 25 Marks)
1. A solar cell converts light energy into
a) Electrical energy b) Thermal energy c) Sound energy d) Heat energy
2. There are three types of the solar cells.
a) True b) False
3. Series and parallel combination of the solar cell is known as
a) Solar array b) Solar light c) Solar sight d) Solar eye
4. Full form of FF in the solar field is
a) Form factor b) Fill factor c) Face factor d) Fire factor
5. Calculate Fill factor using the data: Pmax=15 W, Voc=18 V, Isc=4 A.
a) .65 b) .59 c) .20 d) .98
6. Material used for making solar cell is
a) Silicon b) Carbon c) Sodium d) Magnesium
7. The term photo voltaic comes from
a) Spanish b) Greek c) German d) English
8. A typical output of a solar cell is  Dr. G. Balakrishnan, M.E., Ph.D.,  Principal
a) 0.1 V b), 0.26 V c), 1.1 V d), 2 V  Indra Ganesan College of Engineering  IG Valley, Madurai Main Road
9. The efficiency of a solar cell may be in the range  Manikandam, Trichy-620 012.
a) 2 to 5% b) 10 to 15% c) 30 to 40% d) 70 to 80%
10. A module in a solar panel refers to
<ul> <li>a) Series arrangement of solar cells.</li> <li>b) Parallel arrangement of solar cells.</li> <li>c) None of the above.</li> </ul>





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11.	The	current	density	of a	photo	voltaic	cell	ranges	from	
-----	-----	---------	---------	------	-------	---------	------	--------	------	--

- a)  $10 20 \text{ mA/cm}^2$
- b). 40 50 mA/cm2 c) 20 40 mA/cm2
- d)  $60 100 \text{ mA/cm}^2$

## 12. The function of a solar collector is to convert......

- a) Solar Energy into Electricity
- b) Solar Energy radiation
- b) c). Solar Energy thermal energy
- d) Solar Energy mechanical energy

## 13. What is the rate of solar energy reaching the earth surface?

- a) 1016
- b) 865W
- c) 2854W
- d) 1912W

# 14. What is total amount of solar energy received by earth and atmosphere?

- a) 3.8 X 1024 J/year
- b) 9.2 X 1024 J/year
- c) 5.4 X 1024 J/year
- d) 2.1 X 1024 J/year

# 15. The process of converting light (photons) to electricity (voltage) is called:

a) PV effect. b) Solar cell. c) Radiation.

## 16....converts sunlight directly into solar power (electricity).

a) Battery. b) Solar cell. c) Inverter.

## 17. The most expensive type of the solar cells is:

a) Amorphous. b) Polycrystalline. c) Monocrystalline.

## 18. Which type of solar cells has highest efficiency?

a) Amorphous. b) Polycrystalline. c) Monocrystalline.

19. 5-Which type of solar cells is more efficient in low lights:

a) Amorphous. b) Polycrystalline. c) Monocrystalline.

Dr. G. Balakrishnan, M.E., Ph.D., **Principal** 

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## 20. All the electricity produced by the solar panels is produced as:

b) DC c) both DC and AC. a) AC

## 21. The device which converts the DC to AC is:

a) Transformer. b) Relay. c) Inverter.

## 22. Interactive PV systems operate:

a) Stand alone. b) In parallel with the grid. c) None.



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- 23. The initial cost of PV systems is:
  - a) Low. b) Medium. c) High.
- 24. Energy production from PV systems depends on:
  - a) Location. b) Wheather. c) Both a and b
- 25. The running cost of PV systems is:
  - a) High. b) Low. c) Medium.

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

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# Indra Ganesan



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#### Value Added Course

## "Solar Photovoltaic System Design"

#### ANSWER KEY

1	a	6	a	11	Ъ	16	ь	21	c
2	a	7	b	12	С	17	С	22	b
3	а	8	b	13	а	18	c	23	c
4	b	9	ъ	14	а	19	a	24	c
5	c	10	c	15	a	20	ъ	25	b

Du C. Dalahuishnan ME

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
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IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

Jehry Jerefer

P. Dheven thisan 13 08 21 81391910500 Solar Photovoltair System Design 11 year / 04 8em 1) a) Edectrical Energy 2) a) True 3) a) Sodar orray 4) b) dill factor 5) c) 20 6) a) Silicon 1) b) Good 8) C) 1-0K 10) C) Series and parallel arrangement worlds cells 9) 6) 10 to 45 4. 11) b) 40-50 mA/cm (2) c) 30 dos enogy thermal energy (3) a) 1016 (4) 6) 9.2 X to 34 J/geos 15) a) PV expect 16) b) Soder cell (1) e) Monooystalline Dr. G. Balakrishnan, M.E., Ph.D., Principal 18) b) poets orystalline Indra Ganesan College of Engineering IG Valley, Madurai Main Road 19) A) Amosiphous Manikandam, Trichy-620 012. 20) b) RS 21) e) Inventes In porallel with good

## 811917105011

Solar photovoltair System Design TV - year EEE 10750m

1 (a) Electrical series

a la was

3 (a) sola aday

4 (b) Fall factor

5.(c) . pg

6 (a) sililon

7 (b) Cryster

8 (c) 17th

9 (P) 10 to 121

10 c) societ pand parallel assangement of solar Cetts

b) 40- 50 matcm

12 c) solar energy thermal energy

13 a) job

14 6) 9.2 X 10 20 X 4900x

15 a) pv placet

16. 6) Solar Cell

17 t) Mono Crysfalline

b) polycrystalline

19 a) Amonphous

20 b) Dd

21 . c) Investor

22. b) In popular with the grid

c) High

Dr. G. Balakrishnan, M.E., Ph.D., Principal Indra Ganesan College of Engineering IG Valley, Madurai Main Road Manikandam, Trichy-620 012.

811218105008

# 11) year / 06 sem

# Solar Photovoltaic System Design

1. (a) Electrical, energy

- 2. (a) True
- (a) Solar array
- 4 (6) Fill factor
- (c) . 20
- (a) Silicon
- 7 (b) Greek
- 8 (1) 1.19
- 9 (b) to to

10 (C) Series and parallel arrangement of Solar cells

11. (b) 40-50 mA Lema

12 (1) Solar Energy thermal energy

(a) 10 (b)

14 6) 9. a x 10 a4 J/yles

15. a) PV effect

16. (b) Solar cell

17 (2) Mono crystalline

18 (b) Polyarystallade

19. (a) Amorphous

20. (b) DG

al (c) Invertex

90. (b) In parallel with the

88 (1) High

an cas location

85. (b) low

Dr. G. Balakrishnan, M.E., Ph.D., Principal

Indra Ganesan College of Engineering IG Valley, Madurai Main Road Manikandam, Trichy-620 012.



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# Department of Electrical and Electronics Engineering

# Academic Year 2020-2021 - Even Semester

# VALUE ADDED COURSE ASSESMENT SHEET

"Solar Photo Voltaic System Design"

Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road

Dr. G. Balakrishnan, M.E., Ph.D.,

IG Vallëy, Madurai Main I Manikandam, Trichy-620		. egyptyras sager-agentyras	"Solar Photo			ce Details	VAC-M	CQ TEST	OVERALL MARK
wanikandani, meny-620	S.NO	Register Number			No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	(100) (50% of A + 50% of B)
				A VIPPP	30	100	20	80	90
	1		ARUL JOY ASHA A	IV/EEE	30	100	19	76	88
	2	811217105006	ARUN SEBASTIN P	IV/EEE	27	90	19	76	83
	3	811217105007	BHARTHASARATHI M	IV/EEE		90	21	84	87
	4	811217105008	CHITHRA P	IV/EEE	27	90	19	76	83
	5	811217105009	DEEPIKA G	IV/EEE	27	90	19	76	83
	6	811217105010	EZHUMALAI A	IV/EEE	27	100	20	80	90
	7	811217105011	GAYATHRI K	IV/EEE	30	90	21	84	87
	8	811217105012	GAYATHRI S	IV/EEE	27	90	19	76	83
	9	811217105013	KANIMOZHI S	IV/EEE	27	90	19	76	83
	10	811217105014	KEERTHANA S	IV/EEE	- 0	100	21	84	92
		811217105015	KUMARIVALLIT	IV/EEE	m. 400	90	20	80	85
	11 12 13	811217105016	MADHUMITHA S	IV/EEE		field I	$\frac{20}{21}$	84	92
			and the same of th	IV/EEE	30	100	- Ad &	management para	au \$ m

Dr. G. Balakrishnan, M.E., Ph.D., Principal
Indra Ganesan College of Engineering

IG Valley, Madurai Main Road Manikandam, Trichy-620 012.



# Indra Ganesan

# COLLEGE OF ENGINEERING

Madurai Main Road (NH-458), Manikandam, Tiruchirappalil - 620 012 Approved by AICTE, New Delhi & Affiliated to Anna University, Chemus NAAC Accredited, 2(F) Status Institution by UGC



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S.NO	Register Number			No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	(100) (50% of A + 50% of B)
						20	80	90
14	811217105018	MEKALA M	IV/EEE	27	90	19	76	83
15	811217105020	PAVITHRA S	IV/EEE	24	80	20	80	80
16	811217105021	PRAVEEN RAJ R	IV/EEE	the same of the same of	80	21	84	82
17	811217105022	RAJASEKAR.N V	IV/EEE	24 27	90	22	88	89
18	811217105023	REVATHI P	IV/EEE	Ť quest, st-	100	20	80	90
19	811217105024	RISHON GURU M	IV/EEE	30	90	21	84	87
20	811217105026	SANTHOSH K	IV/EEE	27	80	20	80	80
21	811217105027	SRIKUMAR M S	IV/EEE	24	90	21	84	87
22	811217105028	SRI LOGESH C	IV/EEE	27	100	20	80	90
23	811217105029	SUBHA T	IV/EEE	30	100	21	84	92
24	811217105031	VALARMATHI C	IV/EEE	30	100	19	76	88
25	811217105032	VISWANATH R	IV/EEE	30	100	21	84	92
26		SANJEEV KUMAR R	IV/EEE	30	90	20	80	85
27		ARUN PRAVEEN RAJ A	III/EEE	27	90	19	76	83
28		HARIHARAN M	III/EEE	,	90	19	76	83
29	maker appropriate the president appropriate	INBARAJ A	III/EEE		90	20	80	85
30		JEYA STEPHEN S	III/EEE	and the contract of		21	84	92
31	and the second of the second o	MANIKANDAN N	III/EEE	200 2000		19		83
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S.NO	Register Number	Name	YEAR/ BRANCH	Attendance Details		VAC-MCQ TEST		OVERALL MARK
				No. of Hours Attendance Mark(100) Attended (A)		No of Correct Answers	MCQ Mark(100) (B)	(100) (50% of A + 50% of B)
				24	80	21	84	82
33	811218105007	SASIKUMAR R	III/EEE	27	90	20	80	85
34	811218105008	SIVAKUMAR P	III/EEE	references to the	100	21	84	92
35	811218105009	VEERA RAGAVAN A	III/EEE	30	minute property and intraction and the substitute	20	80	85
36	811218105010	YUVARAJ S	III/EEE	27	90	19	76	88
37	811219105002	M.BARATH	II/EEE	30	100	20	80	90
38	811219105003	A.MANIKANDAN	II/EEE	30	100		84	92
39	811219105005	C.PONNALAGU	II/EEE	30	100	21	84	87
	811219105006	A.SALAMON	II/EEE	27	90	21		80
40	811219105007	M.SARAVANAKUMAR	II/EEE	24	80	20	80	87
41	And the second section of the	K.SOLAIMATHI	II/EEE	27	90	21	84	
42	811219105008	A AND DESCRIPTION OF THE PROPERTY AND DESCRIPTION OF THE PROPE	II/EEE	30	100	20	80	90
43	813919105001	P.DHEVENTHIRAN	11/EEE	27	90	19	76	83
44	811219105301	A. VENKATRAMAN	1.7					

Dr. G. Balakrishnan, M.E., Ph.D., Principal Indra Ganesan College of Engineering IG Valley, Madurai Main Road Manikandam, Trichy-620 012.~

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Title:	"Solar	Photo	Voltaic System	Design		Aug on-summing a sector year and a sector of the sector of	ann air Agailte an eile 194	
Resource reisons. Mi		Mic	ridhar, Trainer, ro win Automa hy-621216					
Date of conduct from :		m:	09.08.2021	То:	13.08.2021 Duration:		30 Hours	
Organized Department:			Electrical and Electronics Engineering					
Participant Year: 2,3,4		de de la companya de		No. of Registe	44			
Venue:					le.com/333-5625		lants can able to	
Ou	tcome of	Value	Added Course	(VAC): A	At the end of the	e Course, Stuu	lents can able to	
<ol> <li>Devel</li> <li>Devel</li> <li>Design</li> </ol>	op a compop unders	prehen standin ulate a	sive technologic g on the PV plan PV power plan	eal underst nt design a t using sof n and mai ental perfe	anding in solar I and select suitable ftware tool.	PV system com le technologies	iponents.	

VAC Coordinato

marks)

is eligible to receive the certificate for the VAC course conducted

Gr. Ma batta

• Total Score = (0.5 \*Attendance in VAC out of 100 percentage + 0.5 \*Test mark in VAC out of 100

rindpal

Dr. G. Balakrishnan, M.E., Ph.D., Principal

**Indra Ganesan College of Engineering** IG Valley, Madurai Main Road Manikandam, Trichy-620 012.



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Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

# Sample Photo of Value Added Course

Title:

"Solar Photo Voltaic System Design"

Resource Persons:

S. Sridhar, Trainer,

Micro win Automation,

Trichy-621216

Date of conduct from:

09.08.2021

To:

13,08.2021

Duration:

30 Hours

Organized Department:

Electrical and Electronics Engineering

Participant Year:

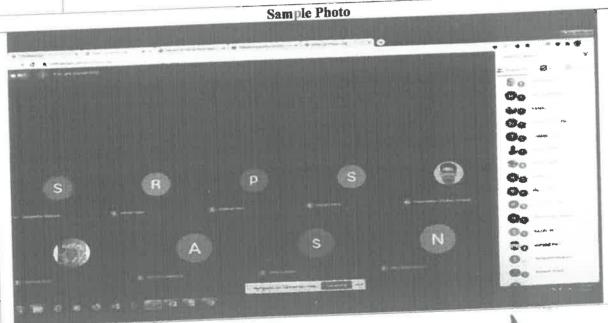
2,3,4

No. of Students Registered:

44

Venue:

online mode Google Meet: meet.google.com/333-5625-245



Gr. Ma lathi HOD/EEE











This is to certify that Ms.DEEPIKA G, IV Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9<sup>th</sup> August 2021 to 13<sup>th</sup> August 2021 (5days) during the Academic year 2020-2021.

Microwin Automation
Mr.C.Syam Kumar
Chief Executive Officer.

Dr. G. Balakrishnan, M.B., And Principal
Indra Ganesan College of Engineering
IG Valley, Madural Main Road

Manikandem, Trichy-620 012.









This is to certify that Mr.MANO K, IV Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9<sup>th</sup> August 2021 to 13<sup>th</sup> August 2021 (5days) during the Academic year 2020-2021.

Microwin Automation
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Chief Executive Officer.

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal
Indra Ganeson College of Engineering
IG Vallay, Madural Main Road





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# CERTIFICATE OF PARTICIPATION

This is to certify that Mr. SANTHOSH K, IV Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9th August 2021 to 13th August 2021 (5days) during the Academic year 2020-2021.

Microwin Automation
Mr.C.Syam Kumar
Chief Executive Officer.

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
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# CERTIFICATE OF PARTICIPATION

This is to certify that Ms.CHITHRA P, IV Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9th August 2021 to 13th August 2021 (5days) during the Academic year 2020-2021.

Automation Mr.C.Syam Kumar Chief Executive Officer.

Indra Ganesan College of Engineering!

IG Valley, Madurai Main Road Manikandam, Trichy-620 012. **IGCE** 









This is to certify that Ms.PAVITFIRA S, IV Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9th August 2021 to 13th August 2021 (5days) during the Academic year 2020-2021.

Microwin Automation
Mr.C.Syam Kumar
Chief Executive Officer.

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madural Main Road
Manikandam, Trichy-620 012.









This is to certify that Ms.REVATHI P, IV Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9<sup>th</sup> August 2021 to 13<sup>th</sup> August 2021 (5days) during the Academic year 2020-2021.

Microwin Automation
Mr.C.Syam Kumar
Chief Executive Officer.

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Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madural Main Road
Manikandam, Trichy-620 012.









This is to certify that Mr. ARUN PRAVEEN RAJ A, III Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9th August 2021 to 13th August 2021 (5days) during the Academic year 2020-2021.

Micro win Automation Mr.C.Syam Kumar Chief Executive Officer. <u>(X.</u>

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IS Valley, Madurai Main Road
Manikandam, Trichy-620 012.







This is to certify that Mr. HARIHARAN M, III Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9th August 2021 to 13th August 2021 (5days) during the Academic year 2020-2021.

Micro win Automation
Mr.C.Syam Kumar
Chief Executive Officer.

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

Indra Ganesan College of Engineering IG Valley, Medurai Main Road Manikandam, Trichy-620 012.









This is to certify that Mr. JEYA STEPHEN S, III Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9<sup>th</sup> August 2021 to 13<sup>th</sup> August 2021 (5days) during the Academic year 2020-2021.

Miero win Automation
Mr.C.Syam Kumar
Chief Executive Officer.

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

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This is to certify that Mr. PADMANABAN A, III Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9th August 2021 to 13th August 2021 (5days) during the Academic year 2020-2021.

Micro win Automation
Mr.C.Syam Kumar
Chief Executive Officer.

UX.

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madural Main Road
Manikandam Trichy-620 012.











This is to certify that Mr. INBARAJ A, III Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9<sup>th</sup> August 2021 to 13<sup>th</sup> August 2021 (5days) during the Academic year 2020-2021.

Miero win Automation
Mr.C.Syam Kumar
Chief Executive Officer.

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madural Main Road
Manikandam, Trichy-620 012.









This is to certify that Mr. VEERA RAGAVAN A, III Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9th August 2021 to 13th August 2021 (5days) during the Academic year 2020-2021.

Miero win Automation
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Chief Executive Officer.

CX.

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.









This is to certify that Mr. P.DHEVENTHIRAN, II Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9th August 2021 to 13th August 2021 (5days) during the Academic year 2020-2021.

Micro win Automation
Mr.C.Syam Kumar
Chief Executive Officer.

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This is to certify that Ms. C.PONNALAGU, II Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9th August 2021 to 13th August 2021 (5days) during the Academic year 2020-2021.

Micro with Automation
Mr.C.Syam Kumar
Chief Executive Officer.

<u>Q.</u>.

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
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Principal -









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## CERTIFICATE OF PARTICIPATION

This is to certify that Mr. M.SARAVANAKUMAR, II Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9<sup>th</sup> August 2021 to 13<sup>th</sup> August 2021 (5days) during the Academic year 2020-2021.

Micro win Automation
Mr.C.Syam Kumar
Chief Executive Officer.

Dr. G. Balakrishman, M.E., Ph.D.,
Principal
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IG Valley, Madurai Main Road
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# CERTIFICATE OF PARTICIPATION

by Department of Electrical & Electronics Engineering and IQAC of our Institution in (5days) during the Academic year 2020-2021 Association with Micro win Automation, from 9th August 2021 to 13th August 2021 completed the Value Added Course on "Solar Photovoltaic System Design" organized This is to certify that Mr. A. VENKATRAMAN, II Year, EEE has successfully

Micro win Automation
Mr.C.Syam Kumar
Chief Executive Officer.

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
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# CERTIFICATE OF PARTICIPATION

This is to certify that Mr. M.BARATH, II Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9th August 2021 to 13th August 2021 (5days) during the Academic year 2020-2021.

Micro win Automation
Mr.C.Syam Kumar
Chief Executive Officer.

Dr. G. Balakrishnan, M.E., Ph.D.,

Indra Ganesan College of Engineering
IG Valley, Madural Main Road
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# CERTIFICATE OF PARTICIPATION

This is to certify that Ms. K.SOLAIMATHI, II Year, EEE has successfully completed the Value Added Course on "Solar Photovoltaic System Design" organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Micro win Automation, from 9th August 2021 to 13th August 2021 (5days) during the Academic year 2020-2021.

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