



# Indra Ganesan

## COLLEGE OF ENGINEERING

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai  
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 – 2

## TEACHING-LEARNING AND EVALUATION

SUBMITTED BY

# IQAC

INTERNAL QUALITY ASSURANCE CELL  
INDRA GANESAN COLLEGE OF ENGINEERING





**Criteria2**

**Teaching-Learning and Evaluation**

**350**

**KeyIndicator-2.3.Teaching-Learning Process(40)**

**2019-2020**

**PARTICIPATIVE LEARNING**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

<b>Activity</b>	<b>Number of Students Attended</b>	<b>Page No.</b>
<b>Value Added Course(VAC)</b>	<b>126</b>	<b>3</b>
<b>TOTAL STUDENTS ATTENDED</b>	<b>126</b>	<b>-</b>



**Criteria2**

**Teaching-Learning and Evaluation**

**350**

**KeyIndicator-2.3.Teaching-Learning Process(40)**

**2019-2020**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**PARTICIPATIVE LEARNING**

**VALUE ADDED COURSE**



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**COLLEGE OF ENGINEERING**  
Madurai Main Road (NH-45B), Manikandam, Trichy-12.  
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Department of Electrical and Electronics Engineering  
Academic Year 2019-2020 –Odd Semester

04.12.2019

## DEPARTMENT CIRCULAR

Department of Electrical and Electronics Engineering and IQAC of IGCE in association with Sri Sai Software is going to organize Value Added Course for all Second, Third and Final year students on “Automation and Robotics” from 09.12.2019 to 13.12.2019. Certificates will be issued to the eligible participants at the end of the Course. This training is to be provided in our campus.

Resource Person Detail	1. Dr.M.Abbas, Design Engineer, Sri Sai Software.
Venue	EEE III yr Classroom, IGCE

*G. Ma Lathi*

HOD/EEE

*[Signature]*  
PRINCIPAL

Cc:

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

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




Value Added Course  
“Automation and Robotics”

SYLLABUS

S.NO	TOPIC COVERED	DURATION (in hours)	DATE
1	Introduction to robots and robotics	3	09.12.2019
2	Robots kinematics	3	09.12.2019
3	Robots kinematics	3	10.12.2019
4	Trajectory planning	3	10.12.2019
5	Singularity checking	3	11.12.2019
6	Robots dynamics	3	11.12.2019
7	Control scheme, Sensors	3	12.12.2019
8	Robot vision	3	12.12.2019
9	Robot motion planning	3	13.12.2019
10	Intelligent robot and Automation	3	13.12.2019
11	Exam	1	13.12.2019
Total Hours (Excluding Test)		30	-

  
VAC Coordinator

  
HOD/EEE

  
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

### “Automation and Robotics”

#### STUDENTS PARTICIPATION LIST

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

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

S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH
1	811216105001	ATTCHAYA A K	IV/EEE
2	811216105003	BENAZIR M	IV/EEE
3	811216105004	GUNA SEELAN D	IV/EEE
4	811216105005	HARI GOWTHAM M	IV/EEE
5	811216105006	HARIHARAN B	IV/EEE
6	811216105007	ISWARYA K	IV/EEE
7	811216105008	KALISTA P	IV/EEE
8	811216105009	KHAJAMOINUDEEN S	IV/EEE
9	811216105010	KIRUTHIKA B	IV/EEE
10	811216105011	LOURDHU MARY D	IV/EEE
11	811216105012	MARIA SHOBANA J	IV/EEE
12	811216105014	MERLIN REETA P	IV/EEE
13	811216105015	NIROSHINI R	IV/EEE
14	811216105016	NITHING A	IV/EEE
15	811216105017	PAVENTHAN A	IV/EEE
16	811216105018	PRAVEEN KUMAR M	IV/EEE
17	811216105019	PRISILLA PRIYANKA	IV/EEE
18	811216105020	RAJA V	IV/EEE
19	811216105021	RATHINA RAJ R	IV/EEE
20	811216105023	RESHMI D	IV/EEE



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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH
21	811216105024	ROOBINI S	IV/EEE
22	811216105025	SURESH K	IV/EEE
23	811216105026	SURIYA PRAKASH K	IV/EEE
24	811216105027	TAMILARASAN M	IV/EEE
25	811216105028	TAMILAZHAGAN M	IV/EEE
26	811216105029	VINOTH R	IV/EEE
27	811216105302	PARKAVI S	IV/EEE
28	811217105005	ARUL JOY ASHA A	III/EEE
29	811217105006	ARUN SEBASTIN P	III/EEE
30	811217105007	BHARTHASARATHI M	III/EEE
31	811217105008	CHITHRA P	III/EEE
32	811217105009	DEEPIKA G	III/EEE
33	811217105010	EZHUMALAI A	III/EEE
34	811217105011	GAYATHRI K	III/EEE
35	811217105012	GAYATHRI S	III/EEE
36	811217105013	KANIMOZHI S	III/EEE
37	811217105014	KEERTHANA S	III/EEE
38	811217105015	KUMARIVALLI T	III/EEE
39	811217105016	MADHUMITHA S	III/EEE
40	811217105017	MANO K	III/EEE
41	811217105018	MEKALA M	III/EEE
42	811217105020	PAVITHRA S	III/EEE
43	811217105021	PRAVEEN RAJ R	III/EEE
44	811217105022	RAJASEKAR.N V	III/EEE

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

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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH
45	811217105023	REVATHI P	III/EEE
46	811217105024	RISHON GURU M	III/EEE
47	811217105026	SANTHOSH K	III/EEE
48	811217105027	SRIKUMAR M S	III/EEE
49	811217105028	SRI LOGESH C	III/EEE
50	811217105029	SUBHA T	III/EEE
51	811217105031	VALARMATHI C C	III/EEE
52	811217105032	VISWANATH R	III/EEE
53	811217105301	SANJEEV KUMAR R	III/EEE
54	811218105001	ARUN PRAVEEN RAJ A	II/EEE
55	811218105002	HARIHARAN M	II/EEE
56	811218105003	INBARAJ A	II/EEE
57	811218105004	JEYA STEPHEN S	II/EEE
58	811218105005	MANIKANDAN N	II/EEE
59	811218105006	PADMANABAN A	II/EEE
60	811218105007	SASIKUMAR R	II/EEE
61	811218105008	SIVAKUMAR P	II/EEE
62	811218105009	VEERA RAGAVAN A	II/EEE
63	811218105010	YUVARAJ S	II/EEE

  
VAC Coordinator



  
HOD/EEE

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## Department of Electrical and Electronics Engineering

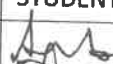

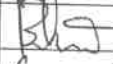
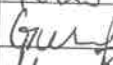
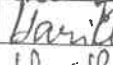
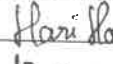
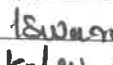
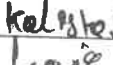
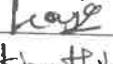
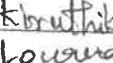
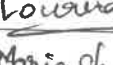
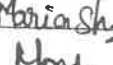
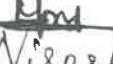
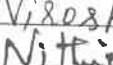
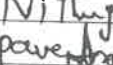
Academic Year 2019-2020 – Odd Semester

### STUDENTS ATTENDANCE LIST

#### Value Added Course

#### “Automation and Robotics”

  
Dr. G. Balakrishnan, M.E., Ph.D.,  
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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH	09.12.2019		10.12.2019		11.12.2019		12.12.2019		13.12.2019		NO OF SESSIONS ATTENDED	SIGN OF THE STUDENT
				FN	AN	FN	AN	FN	AN	FN	AN	FN	AN		
1	811216105001	ATTCHAYA K	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	
2	811216105003	BENAZIR M	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	
3	811216105004	GUNA SEELAN D	IV/EEE	✓	✓	a	✓	✓	✓	✓	✓	✓	✓	10	
4	811216105005	HARI GOWTHAM M	IV/EEE	✓	✓	✓	✓	a	✓	✓	✓	✓	✓	9	
5	811216105006	HARIHARAN B	IV/EEE	✓	✓	✓	✓	✓	✓	a	a	✓	✓	9	
6	811216105007	ISWARYA K	IV/EEE	✓	a	✓	✓	✓	✓	✓	✓	✓	✓	8	
7	811216105008	KALISTA P	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	9	
8	811216105009	KHAJAMOINUDEEN S	IV/EEE	a	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	
9	811216105010	KIRUTHIKA B	IV/EEE	✓	✓	a	✓	✓	✓	✓	✓	✓	✓	9	
10	811216105011	LOURDHU MARY D	IV/EEE	✓	✓	✓	a	✓	✓	✓	✓	✓	✓	9	
11	811216105012	MARIA SHOBANA J	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	
12	811216105014	MERLIN REETA P	IV/EEE	✓	✓	✓	a	✓	✓	✓	✓	✓	✓	9	
13	811216105015	NIROSHINI R	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	
14	811216105016	NITHING A	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	
15	811216105017	PAVENTHAN A	IV/EEE	✓	✓	✓	✓	✓	a	✓	✓	✓	✓	9	

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

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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH	09.12.2019		10.12.2019		11.12.2019		12.12.2019		13.12.2019		NO OF SESSIONS ATTENDED	SIGN OF THE STUDENT
				FN	AN	FN	AN	FN	AN	FN	AN	FN	AN		
16	811216105018	PRAVEEN KUMAR M	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Praveen K
17	811216105019	PRISILLA PRIYANKA	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Prisilla Priyanka
18	811216105020	RAJA V	IV/EEE	✓	✓	a	a	✓	✓	✓	✓	✓	✓	8	Raja V
19	811216105021	RATHINA RAJ R	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Rathina Raj
20	811216105023	RESHMI D	IV/EEE	✓	✓	✓	✓	a	✓	✓	✓	✓	✓	9	Reshmi D
21	811216105024	ROOBINI S	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Roobini S
22	811216105025	SURESH K	IV/EEE	✓	a	✓	✓	✓	✓	✓	✓	✓	✓	9	Suresh K
23	811216105026	SURIYA PRAKASH K	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	K. Surya Prakash
24	811216105027	TAMILARASAN M	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	M. Tamilarasan
25	811216105028	TAMILAZHAGAN M	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	M. Tamilazhagan
26	811216105029	VINOTH R	IV/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	R. Vinoth
27	811216105302	PARKAVI S	IV/EEE	✓	✓	✓	✓	✓	a	✓	✓	✓	✓	9	S. Parkavi
28	811217105005	ARUL JOY ASHA A	III/EEE	✓	✓	✓	✓	✓	✓	a	a	✓	✓	8	A. Asha
29	811217105006	ARUN SEBASTIN P	III/EEE	✓	✓	✓	✓	✓	a	✓	✓	✓	✓	9	P. Arun
30	811217105007	BHARTHASARATHI M	III/EEE	a	a	✓	✓	✓	✓	✓	✓	✓	✓	8	M. Bharthasathi
31	811217105008	CHITHRA P	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Chithra P
32	811217105009	DEEPIKA G	III/EEE	✓	✓	a	✓	✓	✓	✓	✓	✓	✓	9	G. Deepika
33	811217105010	EZHUMALAI A	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	A. Ezhumalai
34	811217105011	GAYATHRI K	III/EEE	✓	✓	✓	✓	a	✓	✓	✓	✓	✓	9	K. Gayathri
35	811217105012	GAYATHRI S	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	S. Gayathri
36	811217105013	KANIMOZHI S	III/EEE	✓	✓	✓	✓	✓	✓	a	✓	✓	✓	9	S. Kanimozhi

Dr. G. Balakrishnan, M.E., Ph.D.,  
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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH	09.12.2019		10.12.2019		11.12.2019		12.12.2019		13.12.2019		NO OF SESSIONS ATTENDED	SIGN OF THE STUDENT
				FN	AN	FN	AN	FN	AN	FN	AN	FN	AN		
37	811217105014	KEERTHANA S	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Spl...
38	811217105015	KUMARIVALLI T	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Kumarivalli T
39	811217105016	MADHUMITHA S	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Madhumitha S
40	811217105017	MANO K	III/EEE	✓	✓	a	✓	✓	✓	✓	✓	✓	✓	9	Mano K
41	811217105018	MEKALA M	III/EEE	✓	✓	✓	✓	a	a	✓	✓	✓	✓	8	Mekala M
42	811217105020	PAVITHRA S	III/EEE	✓	✓	✓	a	✓	✓	✓	✓	✓	✓	9	Pavithra S
43	811217105021	PRAVEEN RAJ R	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Praveen Raj R
44	811217105022	RAJASEKAR.N V	III/EEE	✓	✓	✓	✓	✓	✓	a	✓	✓	✓	9	Rajasekar N V
45	811217105023	REVATHI P	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Revathi P
46	811217105024	RISHON GURU M	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Rishon Guru M
47	811217105026	SANTHOSH K	III/EEE	a	✓	✓	✓	✓	✓	✓	✓	✓	✓	9	Santhosh K
48	811217105027	SRIKUMAR M S	III/EEE	✓	✓	a	a	✓	✓	✓	✓	✓	✓	8	Srikumar M S
49	811217105028	SRI LOGESH C	III/EEE	✓	✓	✓	✓	✓	✓	a	a	✓	✓	8	Sri Logesh C
50	811217105029	SUBHA T	III/EEE	✓	✓	✓	✓	a	✓	✓	✓	✓	✓	9	Subha T
51	811217105031	VALARMATHI C	III/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Valarmathi C
52	811217105032	VISWANATH R	III/EEE	✓	✓	✓	✓	✓	✓	✓	a	✓	✓	9	Viswanath R
53	811217105301	SANJEEV KUMAR R	III/EEE	a	a	✓	✓	✓	✓	✓	✓	✓	✓	8	Sanjeev Kumar R
54	811218105001	ARUN PRAVEEN RAJ A	II/EEE	✓	✓	✓	a	✓	✓	✓	✓	✓	✓	9	Arun Praveen Raj A
55	811218105002	HARIHARAN M	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	M. Hariharan
56	811218105003	INBARAJ A	II/EEE	✓	✓	✓	✓	a	✓	✓	✓	✓	✓	9	Inbaraj A
57	811218105004	JEYA STEPHEN S	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Jeya Stephen S




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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH	09.12.2019		10.12.2019		11.12.2019		12.12.2019		13.12.2019		NO OF SESSIONS ATTENDED	SIGN OF THE, STUDENT
				FN	AN	FN	AN	FN	AN	FN	AN	FN	AN		
58	811218105005	MANIKANDAN N	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Manikandan N
59	811218105006	PADMANABAN A	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Padmanaban A
60	811218105007	SASIKUMAR R	II/EEE	✓	✓	✓	a	✓	✓	✓	✓	✓	✓	9	Sasikumar R
61	811218105008	SIVAKUMAR P	II/EEE	✓	✓	✓	✓	a	a	✓	✓	✓	✓	8	Sivakumar P
62	811218105009	VEERA RAGAVAN A	II/EEE	✓	✓	✓	✓	✓	✓	✓	a	✓	✓	9	Veera Ragavan A
63	811218105010	YUVARAJ S	II/EEE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	Yuvaraj S

  
VAC Coordinator

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

  
HoD/EEE



# Indra Ganesan

COLLEGE OF ENGINEERING  
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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

Name of the Student:

Year/Sem:

AU Register Number:

## Value Added Course

### **“Automation and Robotics”**

#### **MULTIPLE CHOICE QUESTIONS (25X1 = 25 Marks)**

1. A place where power, information, or a result leaves a system
  1. Chassis
  2. Output
  3. Sensor
  4. Troubleshooting
2. Which of the following describes the a use of technology or machinery, specifically Involving gases?
  1. Pneumatics
  2. Hydraulics
  3. Actuation
  4. Carbonation
3. The position or alignment relative to points of the compass or other specific Directions.
  1. Loops
  2. Sensor
  3. Chassis
  4. Orientation
4. A mechanism having its motive power so concealed that it appears to move Spontaneously
  1. Automatic
  2. Clock Jack
  3. Robot
  4. Automata
5. The the branch of technology that deals with dimensions of microscopic proportion, is Known as?
  1. Nannytechnology
  2. Nanotechnology
  3. Microtechnology
  4. Micromachinery
6. Which of the following is not an advantage of Robots?
  1. They can assist humans with disabilities
  2. They can replace jobs
  3. They can be used in dangerous environment
  4. They don't get tired or require a break
7. The Hummingbird \_\_\_\_\_ require extra power to be able to work.
  1. Sensors
  2. LEDs
  3. Motors
  4. Tri-Color LEDs
8. The branch of technology that deals with the design, construction, operation, and Application of robots \_\_\_\_\_
  1. Levers
  2. Robotics
  3. Creative power
  4. Science CSF

  
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9. When working in a group for robotics, student's should \_\_\_\_\_
1. Stay on task but don't work with other group members
  2. Socialize with group members outside of your group and then work alone
  3. Socialize with other group members and don't help your group
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10. A rigid external covering for the body in some invertebrate animals but also robots.
1. Exoskeleton
  2. Armor
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  4. Hardware
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  2. A robot can't go to school
  3. A robot must obey orders given it by human beings except where such orders would conflict with the First law
  4. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law
12. How many systems does a robot have?
1. 2
  2. 6
  3. 4
  4. 3
13. Engines and joints belong to what system?
1. Digestive system
  2. Sensory system
  3. Electric system
  4. Mechanic system
14. How many types of robots are there?
1. 7
  2. 10
  3. 6
  4. 8
15. What are the components of the electric system?
1. Electric joints and cables
  2. Batteries and electric wiring
  3. Engines and joints
  4. Thunder and lightning
16. How many components does the control system have?
1. 4
  2. 1
  3. 2
  4. 5
17. The processor belongs to the \_\_\_\_\_
1. Sensory system
  2. Mechanic system
  3. Electric system
  4. Control system
18. One of these is NOT a type of robot \_\_\_\_\_
1. Medical
  2. Industrial
  3. Household
  4. Apologetic

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19. The small mobile robot base used in the Robot Educator. This robot is able to perform some but not all of the tasks in the Robotics Engineering activities \_\_\_\_\_

1. Light sensor
2. Lego Mind storms Education Software
3. Robot
4. Robot Educator Model (REM)

20. A block is the basic unit of programming in the NXT programming Software. Blocks perform their operations in order along the Sequence Beam \_\_\_\_\_

1. Touch Sensor
2. Block (programming)
3. Ports
4. Behaviors

21. The primary source of physical motion in the Mind storms NXT system.

1. Interactive Servo Motor
2. Behaviors
3. Light Sensor
4. Touch Sensor

22. A machine that is able to interact with and respond to its environment characterized by three central capabilities: the ability to Sense, the ability to Plan, and the ability to Act \_\_\_\_\_

1. Code
2. Taskbot
3. Robots
4. Ports

23. The three characteristic capabilities that define a robot \_\_\_\_\_

1. Comment
2. Sensor
3. Sense-Plan-Act
4. NXT Brick

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Value Added Course  
**“Automation and Robotics”**

ANSWER KEY

1	2	6	2	11	3	16	2	21	1
2	1	7	3	12	3	17	4	22	3
3	4	8	2	13	3	18	4	23	3
4	4	9	4	14	4	19	4	24	4
5	2	10	3	15	2	20	2	25	2

  
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Name of the Student: B. Kiruthika

Year/Sem: IV / VII

AU Register Number: 811216105010

## Value Added Course

### "Automation and Robotics"

#### MULTIPLE CHOICE QUESTIONS (25X1 = 25 Marks)

19/25

- A place where power, information, or a result leaves a system
  - Chassis
  - Output
  - Sensor
  - Troubleshooting
- Which of the following describes the a use of technology or machinery, specifically Involving gases?
  - Pneumatics
  - Hydraulics
  - Actuation
  - Carbonation
- The position or alignment relative to points of the compass or other specific Directions.
  - Loops
  - Sensor
  - Chassis
  - Orientation
- A mechanism having its motive power so concealed that it appears to move Spontaneously
  - Automatic
  - Clock Jack
  - Robot
  - Automata
- The the branch of technology that deals with dimensions of microscopic proportion, is Known as?
  - Nannytechnology  
Micromachinery
  - Nanotechnology
  - Microtechnology
  -
- Which of the following is not an advantage of Robots?
  - They can assist humans with disabilities
  - They can replace jobs
  - They can be used in dangerous environment
  - They don't get tired or require a break
- The Hummingbird \_\_\_\_\_ require extra power to be able to work.
  - Sensors
  - LEDs
  - Motors
  - Tri-Color LEDs
- The branch of technology that deals with the design, construction, operation, and Application of robots \_\_\_\_\_
  - Levers
  - Robotics
  - Creative power
  - Science CSF

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1. 2
2. 6
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13. Engines and joints belong to what system?

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14. How many types of robots are there?

1. 7
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15. What are the components of the electric system?

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16. How many components does the control system have?

1. 4
2. 1
3. 2
4. 5

17. The processor belongs to the \_\_\_\_\_

1. Sensory system
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18. One of these is NOT a type of robot \_\_\_\_\_

1. Medical
2. Industrial
3. Household
4. Apologetic

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Name of the Student: Crayathis . K

Year/Sem: III / V

AU Register Number: 811217105011


## Value Added Course

### "Automation and Robotics"

#### MULTIPLE CHOICE QUESTIONS (25X1 = 25 Marks)

20  
—  
2.5

1. A place where power, information, or a result leaves a system  
1. Chassis     2. Output    3. Sensor    4. Troubleshooting
2. Which of the following describes the a use of technology or machinery, specifically Involving gases?  
 1. Pneumatics    2. Hydraulics    3. Actuation    4. Carbonation
3. The position or alignment relative to points of the compass or other specific Directions.  
1. Loops    2. Sensor    3. Chassis     4. Orientation
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1. Automatic    2. Clock Jack     3. Robot    4. Automata
5. The the branch of technology that deals with dimensions of microscopic proportion, is Known as?  
1. Nannytechnology     2. Nanotechnology    3. Microtechnology    4. Micromachinery
6. Which of the following is not an advantage of Robots?  
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1. Sensors    2. LEDs     3. Motors    4. Tri-Color LEDs
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1. Levers     2. Robotics    3. Creative power    4. Science CSF

  
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1. 4
2. 7
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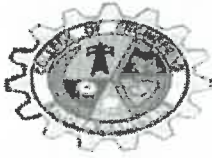


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Name of the Student: *N. Manikandam* Year/Sem: *II/III*

AU Register Number: *811218105005*

## Value Added Course

### "Automation and Robotics"

*20/25*

#### MULTIPLE CHOICE QUESTIONS (25X1 = 25 Marks)

- 1. A place where power, information, or a result leaves a system**  
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- 3. The position or alignment relative to points of the compass or other specific Directions.**  
1. Loops    2. Sensor    3. Chassis     4. orientation
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### STUDENTS PARTICIPATION LIST

Department of Electrical and Electronics Engineering

Academic Year 2019-2020 – Odd Semester

### VALUE ADDED COURSE ASSESMENT SHEET

“Automation and Robotics”

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

S.NO	REG NO	STUDENTS NAME	YEAR/ BRANC H	Attendance Details		VAC-MCQ TEST		OVERALL MARK(100) (50% of A + 50% of B)
				No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	
1	811216105001	ATTCHAYA K	IV/EEE	30	100	20	80	90
2	811216105003	BENAZIR M	IV/EEE	30	100	19	76	88
3	811216105004	GUNA SEELAN D	IV/EEE	27	90	19	76	83
4	811216105005	HARI GOWTHAM M	IV/EEE	27	90	21	84	87
5	811216105006	HARIHARAN B	IV/EEE	24	80	20	80	80
6	811216105007	ISWARYA K	IV/EEE	27	90	19	76	83
7	811216105008	KALISTA P	IV/EEE	30	100	20	80	90
8	811216105009	KHAJAMOINUDEEN S	IV/EEE	27	90	19	76	83
9	811216105010	KIRUTHIKA B	IV/EEE	27	90	19	76	83
10	811216105011	LOURDHU MARY D	IV/EEE	27	90	19	76	83
11	811216105012	MARIA SHOBANA J	IV/EEE	30	100	21	84	92
12	811216105014	MERLIN REETA P	IV/EEE	27	90	20	80	85
13	811216105015	NIROSHINI R	IV/EEE	30	100	21	84	92
14	811216105016	NITHING A	IV/EEE	30	100	19	76	88



# Indra Ganesan

## COLLEGE OF ENGINEERING

Madurai Main Road (NH-45B), Manikandam, Trichy-12.  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

*CO.*

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

S.NO	REG NO	STUDENTS NAME	YEAR/ BRANC H	Attendance Details		VAC-MCQ TEST		OVERALL MARK(100) (50% of A + 50% of B)
				No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	
15	811216105017	PAVENTHAN A	IV/EEE	27	90	19	76	83
16	811216105018	PRAVEEN KUMAR M	IV/EEE	30	100	20	80	90
17	811216105019	PRISILLA PRIYANKA	IV/EEE	30	100	21	84	92
18	811216105020	RAJA V	IV/EEE	24	80	22	88	84
19	811216105021	RATHINA RAJ R	IV/EEE	30	100	20	80	90
20	811216105023	RESHMI D	IV/EEE	27	90	21	84	87
21	811216105024	ROOBINI S	IV/EEE	30	100	20	80	90
22	811216105025	SURESH K	IV/EEE	27	90	21	84	87
23	811216105026	SURIYA PRAKASH K	IV/EEE	30	100	20	80	90
24	811216105027	TAMILARASAN M	IV/EEE	30	100	19	76	88
25	811216105028	TAMILAZHAGAN M	IV/EEE	30	100	20	80	90
26	811216105029	VINOTH R	IV/EEE	30	100	21	84	92
27	811216105302	PARKAVI S	IV/EEE	27	90	20	80	85
28	811217105005	ARUL JOY ASHA A	III/EEE	24	80	19	76	78
29	811217105006	ARUN SEBASTIN P	III/EEE	27	90	19	76	83
30	811217105007	BHARTHASARATHI M	III/EEE	24	80	19	76	78
31	811217105008	CHITHRA P	III/EEE	30	100	20	80	90
32	811217105009	DEEPIKA G	III/EEE	27	90	19	76	83
33	811217105010	EZHUMALAI A	III/EEE	30	100	21	84	92
34	811217105011	GAYATHRI K	III/EEE	27	90	20	80	85



# Indra Ganesan

COLLEGE OF ENGINEERING  
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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

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

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

S.NO	REG NO	STUDENTS NAME	YEAR/ BRANC H	Attendance Details		VAC-MCQ TEST		OVERALL MARK(100) (50% of A + 50% of B)
				No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	
35	811217105012	GAYATHRI S	III/EEE	30	100	21	84	92
36	811217105013	KANIMOZHI S	III/EEE	27	90	20	80	85
37	811217105014	KEERTHANA S	III/EEE	30	100	19	76	88
38	811217105015	KUMARIVALLI T	III/EEE	30	100	21	84	92
39	811217105016	MADHUMITHA S	III/EEE	30	100	21	84	92
40	811217105017	MANO K	III/EEE	27	90	21	84	87
41	811217105018	MEKALA M	III/EEE	24	80	20	80	80
42	811217105020	PAVITHRA S	III/EEE	27	90	21	84	87
43	811217105021	PRAVEEN RAJ R	III/EEE	30	100	20	80	90
44	811217105022	RAJASEKAR.N V	III/EEE	27	90	19	76	83
45	811217105023	REVATHI P	III/EEE	30	100	22	88	94
46	811217105024	RISHON GURU M	III/EEE	30	100	21	84	92
47	811217105026	SANTHOSH K	III/EEE	27	90	22	88	89
48	811217105027	SRIKUMAR M S	III/EEE	24	80	20	80	80
49	811217105028	SRI LOGESH C	III/EEE	24	80	20	80	80
50	811217105029	SUBHA T	III/EEE	27	90	23	92	91
51	811217105031	VALARMATHI C	III/EEE	30	100	22	88	94
52	811217105032	VISWANATH R	III/EEE	27	90	19	76	83
53	811217105301	SANJEEV KUMAR R	III/EEE	24	80	21	84	82
54	811218105001	ARUN PRAVEEN RAJ A	II/EEE	27	90	20	80	85



# Indra Ganesan

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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANC H	Attendance Details		VAC-MCQ TEST		OVERALL MARK(100) (50% of A + 50% of B)
				No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	
55	811218105002	HARIHARAN M	II/EEE	30	100	21	84	92
56	811218105003	INBARAJ A	II/EEE	27	90	19	76	83
57	811218105004	JEYA STEPHEN S	II/EEE	30	100	19	76	88
58	811218105005	MANIKANDAN N	II/EEE	30	100	20	80	90
59	811218105006	PADMANABAN A	II/EEE	30	100	21	84	92
60	811218105007	SASIKUMAR R	II/EEE	27	90	21	84	87
61	811218105008	SIVAKUMAR P	II/EEE	24	80	20	80	80
62	811218105009	VEERA RAGAVAN A	II/EEE	27	90	21	84	87
63	811218105010	YUVARAJ S	II/EEE	30	100	20	80	90

  
VAC Coordinator

  
HoD/EEE

  
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-45B), Manikandam, Trichy-12.  
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<b>Report on Value Added Course</b>					
Title:	"Automation and Robotics"				
Resource Person:	Dr.M.Abbas, Design Engineer, Sri Sai Software				
Date of conduct from :	09.12.2019	To:	13.12.2019	Duration:	30 Hours
Organized Department :	<b>Electrical and Electronics Engineering</b>				
Participant Year:	2,3,4	No. of Students Registered :	63		
Venue:	EEE III yr Classroom				
<b>Outcome of Value Added Course (VAC): At the end of the Course, Students can able to</b>					
<ul style="list-style-type: none"><li>● Understand basic components of robotics, classification of robots and their applications.</li><li>● Know on types of robot grippers, their usage and design considerations.</li><li>● Understand about various types of sensory devices their working and applications.</li><li>● Apply basic transformations related to the movement of manipulator.</li><li>● Design a robot mechanism to meet kinematics requirements and to write simple programs.</li></ul>					
<b>Assessment Process</b>					
<ul style="list-style-type: none"><li>● Students, who are securing <b>more than 70% on total score</b> and secured more than 75% in attendance is eligible to receive the certificate for the VAC course conducted</li><li>● Total Score = (0.5 *Attendance in VAC out of 100 percentage + 0.5 *Test mark in VAC out of 100 marks)</li></ul>					
 VAC Coordinator		 HOD/EEE		 Principal	

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



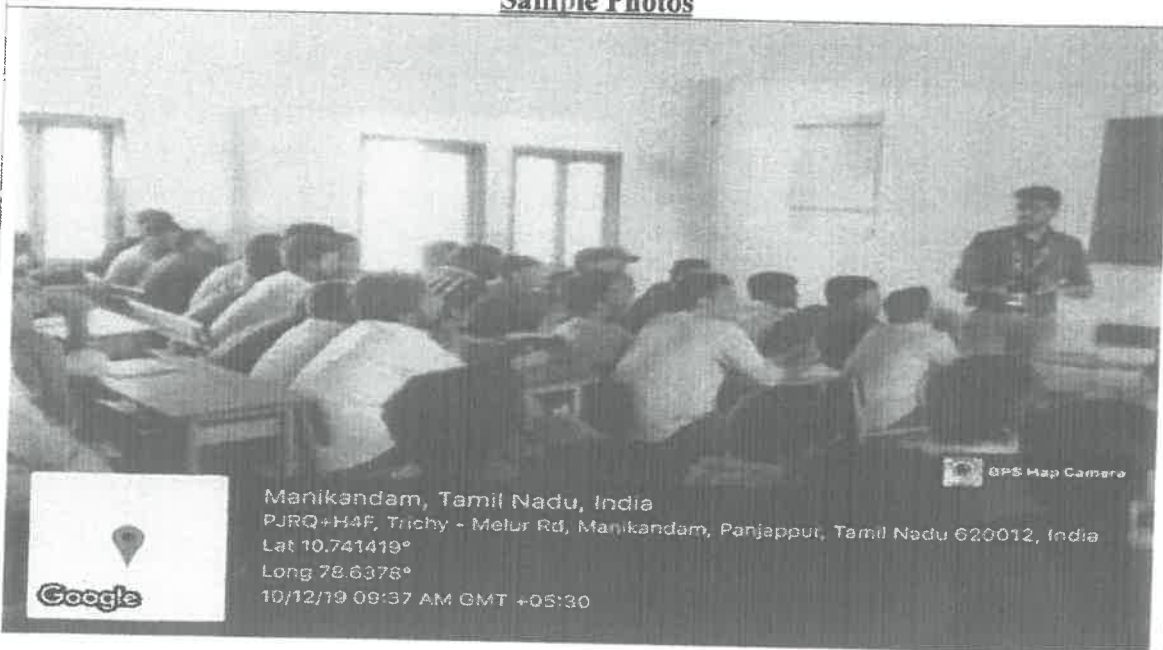
# Indra Ganesan

**COLLEGE OF ENGINEERING**  
Madurai Main Road (NH-46B), Manikandam, Trichy-12.  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

## Sample Photos of Value Added Course

Title:	"Automation and Robotics"				
Resource Person:	Dr.M.Abbas, Design Engineer, Sri Sai Software				
Date of conduct from :	09.12.2019	To:	13.12.2019	Duration:	30 Hours
Organized Department :	Electrical and Electronics Engineering				
Participant Year:	2,3,4	No. of Students Registered :	63		
Venue:	EEE III yr Classroom				

## Sample Photos



  
VAC Coordinator

  
HOD/EEE

  
Principal

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



## CERTIFICATE OF PARTICIPATION

This is to certify that Mr. PAVENTHAN A, IV Year, EEE has successfully completed the Value Added Course on “Automation and Robotics” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Sri Sai Software from 9<sup>th</sup> December 2019 to 13<sup>th</sup> December 2019 (5days) during the Academic year 2019-2020.

**Sri Sai Software**  
**Mr.S.Ritik Singh**  
**Chief Executive Officer.**

**Principal**  
**IGCE**

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

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



## CERTIFICATE OF PARTICIPATION

This is to certify that Mr. ARUN SEBASTIN P, III Year, EEE has successfully completed the Value Added Course on “Automation and Robotics” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Sri Sai Software from 9<sup>th</sup> December 2019 to 13<sup>th</sup> December 2019 (5days) during the Academic year 2019-2020.

**Sri Sai Software**  
**Mr.S.Ritik Singh**  
**Chief Executive Officer.**

**Principal**  
**IGCE**

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

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



## CERTIFICATE OF PARTICIPATION

This is to certify that Mr. VEERA RAGAVAN A, II Year, EEE has successfully completed the Value Added Course on “Automation and Robotics” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Sri Sai Software from 9<sup>th</sup> December 2019 to 13<sup>th</sup> December 2019 (5days) during the Academic year 2019-2020.

**Sri Sai Software**  
**Mr.S.Ritik Singh**  
**Chief Executive Officer.**

**Principal**  
**IGCE**

**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-45B), Manikandam, Tiruchirappalli - 620 012  
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**Department of Electrical and Electronics Engineering**  
**Academic Year 2019-2020 –Even Semester**

15.07.2020

**DEPARTMENT CIRCULAR**

Department of Electrical and Electronics Engineering and IQAC of IGCE in association with Smart Power Care is going to organize Value Added Course for all Second, Third and Final year students on “Smart Grid Technology” From 20.07.2020 to 24.07.2020. 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	1. K. Marimuthu, Senior Project Trainer, Smart Power Care, Thillai Nagar, Trichy
Online Mode	Google Meet

*G. Ma lathi*  
HOD/EEE

*[Signature]*  
PRINCIPAL

Cc:

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

*[Signature]*  
**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-45B), Manikandam, Tiruchirappalli - 620 012  
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NAAC Accredited, 2(F) Status Institution by UGC



## Value Added Course

### “Smart Grid Technology”

#### SYLLABUS

S.NO	TOPIC COVERED	DURATION (in hours)	DATE
1	Introduction to Smart Grid, Architecture, Standards and Elements and Technologies of Smart Grid System.	3	20.07.2020
2	Distributed Generation Resources	3	20.07.2020
3	Introduction to energy storage devices. Analytical modelling of energy storage devices	3	21.07.2020
4	Wide area Monitoring Systems	3	21.07.2020
5	Smart Grid Protection	3	22.07.2020
6	Modelling of DC smart grid components Operation and control of AC Microgrid	3	22.12.2019
7	Operation and control of AC-DC hybrid Microgrid	3	23.12.2019
8	Phasor measurement unit placement Cyber security and resiliency Virtual inertia and ancillary support	3	23.12.2019
9	Simulation and case study of AC Microgrid Simulation and case study of DC Microgrid Simulation and case study of AC-DC Hybrid Microgrid Demonstration of parallel inverter operation in AC Microgrid	3	24.12.2019
10	Design of Smart Grid and Practical Smart Grid Case Study, System Analysis of AC/DC Smart Grid	3	24.12.2019
11	Exam	1	24.12.2019
Total Hours ( Excluding Test)		30	-

  
VAC Coordinator

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

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

  
Gr. Ma Lath  
HOD/EEE



# Indra Ganesan

## COLLEGE OF ENGINEERING

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NAAC Accredited, 2(F) Status Institution by UGC



Value Added Course

**“Smart Grid Technology”**

**STUDENTS PARTICIPATION LIST**

S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH
1	811216105001	ATTCHAYA A K	IV/EEE
2	811216105003	BENAZIR M	IV/EEE
3	811216105004	GUNA SEELAN D	IV/EEE
4	811216105005	HARI GOWTHAM M	IV/EEE
5	811216105006	HARIHARAN B	IV/EEE
6	811216105007	ISWARYA K	IV/EEE
7	811216105008	KALISTA P	IV/EEE
8	811216105009	KHAJAMOINUDEEN S	IV/EEE
9	811216105010	KIRUTHIKA B	IV/EEE
10	811216105011	LOURDHU MARY D	IV/EEE
11	811216105012	MARIA SHOBANA J	IV/EEE
12	811216105014	MERLIN REETA P	IV/EEE
13	811216105015	NIROSHINI R	IV/EEE
14	811216105016	NITHING A	IV/EEE
15	811216105017	PAVENTHAN A	IV/EEE
16	811216105018	PRAVEEN KUMAR M	IV/EEE
17	811216105019	PRISILLA PRIYANKA	IV/EEE
18	811216105020	RAJA V	IV/EEE
19	811216105021	RATHINA RAJ R	IV/EEE

**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-46B), Manikandam, Tiruchirappalli - 620 012  
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r. G. Balakrishnan, M.E., Ph.D.,

Principal

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

SNO	REG NO	STUDENTS NAME	YEAR/ BRANCH
20	811216105023	RESHMI D	IV/EEE
21	811216105024	ROOBINI S	IV/EEE
22	811216105025	SURESH K	IV/EEE
23	811216105026	SURIYA PRAKASH K	IV/EEE
24	811216105027	TAMILARASAN M	IV/EEE
25	811216105028	TAMILAZHAGAN M	IV/EEE
26	811216105029	VINOTH R	IV/EEE
27	811216105302	PARKAVI S	IV/EEE
28	811217105005	ARUL JOY ASHA A	III/EEE
29	811217105006	ARUN SEBASTIN P	III/EEE
30	811217105007	BHARTHASARATHI M	III/EEE
31	811217105008	CHITHRA P	III/EEE
32	811217105009	DEEPIKA G	III/EEE
33	811217105010	EZHUMALAI A	III/EEE
34	811217105011	GAYATHRI K	III/EEE
35	811217105012	GAYATHRI S	III/EEE
36	811217105013	KANIMOZHI S	III/EEE
37	811217105014	KEERTHANA S	III/EEE
38	811217105015	KUMARIVALLI T	III/EEE
39	811217105016	MADHUMITHA S	III/EEE
40	811217105017	MANO K	III/EEE
41	811217105018	MEKALA M	III/EEE
42	811217105020	PAVITHRA S	III/EEE
43	811217105021	PRAVEEN RAJ R	III/EEE
44	811217105022	RAJASEKAR.N V	III/EEE



# Indra Ganesan

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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH
45	811217105023	REVATHI P	III/EEE
46	811217105024	RISHON GURU M	III/EEE
47	811217105026	SANTHOSH K	III/EEE
48	811217105027	SRIKUMAR M S	III/EEE
49	811217105028	SRI LOGESH C	III/EEE
50	811217105029	SUBHA T	III/EEE
51	811217105031	VALARMATHI C	III/EEE
52	811217105032	VISWANATH R	III/EEE
53	811217105301	SANJEEV KUMAR R	III/EEE
54	811218105001	ARUN PRAVEEN RAJ A	II/EEE
55	811218105002	HARIHARAN M	II/EEE
56	811218105003	INBARAJ A	II/EEE
57	811218105004	JEYA STEPHEN S	II/EEE
58	811218105005	MANIKANDAN N	II/EEE
59	811218105006	PADMANABAN A	II/EEE
60	811218105007	SASIKUMAR R	II/EEE
61	811218105008	SIVAKUMAR P	II/EEE
62	811218105009	VEERA RAGAVAN A	II/EEE
63	811218105010	YUVARAJ S	II/EEE

  
VAC Coordinator

  
G. Ma lathvi  
HOD/EEE

Dr. G. Balakrishnan, M.E., Ph.D.,  
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# Indra Ganesan

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## Department of Electrical and Electronics Engineering

Academic Year 2019-2020 – Even Semester

### STUDENTS ATTENDANCE LIST

### Value Added Course

“Smart Grid Technology”

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

S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH	20.07.2020		21.07.2020		22.07.2020		23.07.2020		24.07.2020		NO OF SESSIONS ATTENDED	SIGNATURE OF THE STUDENT
				FN	AN	FN	AN	FN	AN	FN	AN	FN	AN		
1	811216105001	ATTCHAYA A K	IV/EEE	P	P	P	P	P	P	A	P	P	P	9	ONLINE
2	811216105003	BENAZIR M	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
3	811216105004	GUNA SEELAN D	IV/EEE	P	A	P	P	P	P	P	P	P	P	9	
4	811216105005	HARI GOWTHAM M	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
5	811216105006	HARIHARAN B	IV/EEE	A	P	P	P	P	P	P	P	P	P	9	
6	811216105007	ISWARYA K	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
7	811216105008	KALISTA P	IV/EEE	P	P	A	P	P	P	P	P	P	P	9	
8	811216105009	KHAJAMOINUDEEN S	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
9	811216105010	KIRUTHIKA B	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
10	811216105011	LOURDHU MARY D	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
11	811216105012	MARIA SHOBANA J	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
12	811216105014	MERLIN REETA P	IV/EEE	P	P	P	A	P	P	P	P	P	P	9	
13	811216105015	NIROSHINI R	IV/EEE	P	P	P	P	P	A	P	P	P	P	9	

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

Principal

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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH	20.07.2020		21.07.2020		22.07.2020		23.07.2020		24.07.2020		NO OF SESSIONS ATTENDED	SIGNATURE OF THE STUDENT
				FN	AN	FN	AN	FN	AN	FN	AN	FN	AN		
14	811216105016	NITHING A	IV/EEE	P	A	P	P	P	P	P	P	P	P	9	ONLINE
15	811216105017	PAVENTHAN A	IV/EEE	P	P	P	A	P	P	P	P	P	P	9	
16	811216105018	PRAVEEN KUMAR M	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
17	811216105019	PRISILLA PRIYANKA	IV/EEE	P	P	P	P	P	A	P	P	P	P	9	
18	811216105020	RAJA V	IV/EEE	P	P	P	P	P	A	P	P	P	P	9	
19	811216105021	RATHINA RAJ R	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
20	811216105023	RESHMI D	IV/EEE	P	P	P	P	P	P	P	A	P	P	9	
21	811216105024	ROOBINI S	IV/EEE	P	P	P	P	P	A	P	P	P	P	9	
22	811216105025	SURESH K	IV/EEE	P	P	P	P	P	P	P	A	P	P	9	
23	811216105026	SURIYA PRAKASH K	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
24	811216105027	TAMILARASAN M	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
25	811216105028	TAMILAZHAGAN M	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
26	811216105029	VINOTH R	IV/EEE	P	P	P	P	P	P	P	P	P	P	10	
27	811216105302	PARKAVI S	IV/EEE	P	P	P	P	P	P	P	A	P	P	9	
28	811217105005	ARUL JOY ASHA A	III/EEE	P	P	P	P	P	A	P	P	P	P	9	
29	811217105006	ARUN SEBASTIN P	III/EEE	P	P	P	P	P	P	P	A	P	P	9	
30	811217105007	BHARTHASARATHI M	III/EEE	P	P	P	P	P	A	P	P	P	P	9	
31	811217105008	CHITHRA P	III/EEE	P	P	P	P	P	P	P	P	P	P	10	
32	811217105009	DEEPIKA G	III/EEE	P	P	P	P	P	P	P	A	P	P	9	
33	811217105010	EZHUMALAI A	III/EEE	P	P	P	P	P	A	P	A	P	P	8	
34	811217105011	GAYATHRI K	III/EEE	P	P	P	P	P	P	P	A	P	P	9	



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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH	20.07.2020		21.07.2020		22.07.2020		23.07.2020		24.07.2020		NO OF SESSIONS ATTENDED	SIGNATURE OF THE STUDENT
				FN	AN	FN	AN	FN	AN	FN	AN	FN	AN		
56	811218105003	INBARAJ A	II/EEE	P	P	P	P	P	P	A	P	P	P	9	ONLINE
57	811218105004	JEYA STEPHEN S	II/EEE	P	P	P	P	P	P	P	P	P	P	10	
58	811218105005	MANIKANDAN N	II/EEE	P	P	P	P	P	P	P	P	P	P	10	
59	811218105006	PADMANABAN A	II/EEE	P	P	P	P	P	P	P	P	P	P	10	
60	811218105007	SASIKUMAR R	II/EEE	P	P	P	P	P	P	P	A	P	P	9	
61	811218105008	SIVAKUMAR P	II/EEE	P	P	P	P	A	P	P	P	P	P	9	
62	811218105009	VEERA RAGAVAN A	II/EEE	P	P	P	P	P	P	A	P	P	P	9	
63	811218105010	YUVARAJ S	II/EEE	P	P	P	P	P	P	P	P	P	P	10	

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Name of the Student:

Year/Sem:

AU Register Number:

## Value Added Course

### **“Smart Grid Technology”**

#### Multiple Choice Questions (25X1 = 25 Marks)

1. **Power quality monitoring and analysis in the smart grid is done using**
  - a) past time data
  - b) utilizes real - time data
  - c) uses off line data
  - d) does not need any data
2. **One Nation, One Grid, One \_\_\_\_\_.**
  - a) Current
  - b) Frequency
  - c) Phase
  - d) Voltage
3. **Among the following, what is not the function of Smart grid.**
  - a) Interoperability is achieved smoothly among the grid
  - b) Real time monitoring of Grid conditions
  - c) Solve automatically grid disturbances
  - d) Plug and Play ability to connect new generation plants to the grid
4. **In relation to Smart home and building Automation, BAC is \_\_\_\_\_.**
  - a) Building Automation and control systems
  - b) Bus Architecture for Communication
  - c) Basic Automation and Communication
  - d) Broad Area Communication
5. **The \_\_\_\_\_ provides framework and roadmap for smart grid interoperability standards.**
  - a) National Institute of Smart Grid
  - b) National Institute of Micro grid
  - c) National Institute of Standard and Technology
  - d) National Institute of Electrical and Electronic Advancements

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6. Following are some Smart Home and Building Automation standards
- SPBRG, PS, PIC18, ATMEL, SCADA, PLC, ES
  - ZHA, BACnet, KNX, LonWorks, OneNet, X10, INSTEON
  - Zigbee, LAN, MAN, WAN, HAN, DG, COAXLine
  - TCP/IP, IITC, COXZa, COHA, multiSIM, Netauto, I-on
7. Following is NOT a type of IED.
- Protective Relaying Device
  - Circuit Breaker Controllers
  - Capacitor Bank Switches
  - microcontroller based embedded systems
8. WAMS is \_\_\_\_\_.
- Wide area Automation and Management System
  - Wide Area Measurement System
  - Wide Area Management System
  - West Automatic Management System
9. Recloser Controller and voltage regulators are \_\_\_\_\_.
- LEDs
  - MCDs
  - IEDs
  - FASs
10. Pumped Hydro power stations are looked as
- Frequency regulators for the grid
  - bulk power suppliers
  - voltage regulators for the grid
  - conventional generating stations
11. Pumped Hydro power stations are treated as
- reserve power capacities
  - bulk power suppliers
  - voltage regulators for the grid
  - conventional generating stations
12. \_\_\_\_\_ is the condition in which a distributed generator (DG) continues to power a location even though electrical grid power is no longer present.
- Islanding
  - Microgridding
  - Anti-islanding
  - Brown out

  
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13. Which of the following is true in the grid connected operation of the AC Microgrid?
- Battery charging, PV at MPPT, diesel generator regulating the voltage and frequency
  - Battery charging, PV at off MPPT, diesel generator regulating the voltage and frequency
  - Battery charging, PV at MPPT, diesel generator off
  - diesel generator regulating the voltage and frequency
14. VAR compensators are treated as
- simply as active power controller
  - simply as reactive power controller
  - enhancing the power flow controller
  - one of the power conditioning technology for improvement in power quality
15. For power quality and reliability, fast response, soft transfer, isolation
- are the requirements of distributed generation integration
  - are the requirements of conventional generation
  - are not the requirements of distributed generation integration
  - are not the requirements of PSS for distributed generation integration
16. \_\_\_\_\_ is a one that is able to tolerate a fault and continue generating powered with a certain degree of power quality even when dealing with some typical faults such as dip voltage.
- Self-healing system
  - Flexible AC transmission system
  - Resilient system
  - outage management system
17. Isolation transformers, voltage regulators are treated as
- Power conditioning equipment's
  - disturbing network power quality equipment's
  - simply as equipment's serving their purpose
  - simply as source of power

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18. The main responsibility of Application layer in TCP/IP protocol architecture is
- routing packets from source to destination across multiple layers
  - allow users to access network resources
  - transmits raw bits as signals between nodes
  - provides reliable and application independent process to process delivery of messages
19. The main responsibility of Network layer in TCP/IP protocol architecture is
- encapsulation of IP packets coming from the internet layer into frames, frame synchronization
  - allow users to access network resources
  - transmits raw bits as signals between nodes
  - provides reliable and application independent process to process delivery of messages
20. The Smart Grid domains and sub domains use variety of private and non-private \_\_\_\_\_ communication channels
- Wired
  - Wireless
  - wired and wireless
  - optical and coaxial
21. In DC voltage bus the following parameter is known
- DC power
  - Voltage
  - Reactive power
  - Frequency
22. Full form of the SCADA is
- Supervisory control and digital acquisition
  - Supervisory control and data acquisition
  - Supplementary control and data acquisition
  - Supplementary control and digital acquisition
23. Renewable energy is generated from
- Natural resources
  - Artificial resources
  - Nuclear resources
  - does not require any source

  
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24. **Power quality is the ability of a system**

- a) to operate causing disturbance or damage to loads and components
- b) to operate without causing disturbance or damage to loads and components
- c) to lose synchronism of the synchronous machines
- d) None of the above

25. **Which statement from the following is not true for OMS,**

- a) Prediction of location of transformer, fused, recloser or breaker that opened upon failure.
- b) Prioritizing restoration efforts and managing resources based upon criteria such as locations of emergency facilities, size of outages, and duration of outages.
- c) Providing information on extent of outages and number of customers impacted to management, media and regulators.
- d) It is a networking system using mesh topology to interact with consumers and utilities.

  
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## Value Added Course

### “Smart Grid Technology”

#### ANSWER KEY

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

  
VAC Coordinator

  
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24/7/2020

## Smart Grid Technology

- 1) (d) does not need any data
- 2) (c) Phase
- 3) (c) Solve automatically grid disturbances
- 4) (a) Building Automation and control systems
- 5) (a) National Institute of Smart grid
- 6) (a) SPBRG, PS, PIC18, ATMEZ, SCADA, PLC, ES.
- 7) (b) Circuit Breaker controllers
- 8) (e) Wide Area Management Systems
- 9) (b) MCDs
- 10) (a) bulk power suppliers.
- 11) (b) Voltage regulators for the grid
- 12) (b) Anti-islanding
- 13) (d) diesel generator resulting the Voltage and frequency.

20  
 ---  
 25

  
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generation

- 16) (a) Self-healing System
- 17) (b) disturbing network power quality equipments
- 18) (b) allow users to access network resources
- 19) (b) allow users to access network resources
- 20) (b) Wireless ✓
- 21) (d) Frequency ✓
- 22) (a) Supervisory control and digital acquisition ✓
- 23) (a) Natural resources
- 24) (c) to lose synchronism of the synchronous machines
- 25) (d) It is a networking system consisting mesh topology to interact with consumers and utilities.

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14.7.2020

## Smart Grid Technology

S. Keerthana

III / VI

1. d) does not need any data
2. c) Phase
3. c) solve automatically grid disturbances
4. d) Broad Area communication
5. a) National Institute of Smart grid
6. b) ZNA, BA control, KVA, Lon works, one net, Xio, Instecon
7. b) circuit Breaker controllers
8. c) wide Area management System
9. b) MCOs
10. a) Frequency regulators for the grid
11. b) voltage regulators for the grid
12. b) Anti-islanding

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13. d) diesel generator regulating the voltage and frequency

14. c) enhancing the Power flow controller

15. b) are the requirements of conventional generation

16. b) Resilient System

17. d) simply as source of power

18. b) allow users to access network resources

19. b) allow users to access network resources

20. b) wireless

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21. d) Frequency

22. a) supervisory control and digital acquisition

23. a) Natural resources

24. c) to lose Synchronism of the Synchronous machines

25. a) Prediction of location of transformer, fused, recloser or break that opened upon failure.



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## Department of Electrical and Electronics Engineering

Academic Year 2019-2020 – Even Semester

### VALUE ADDED COURSE ASSESMENT SHEET

“Smart Grid Technology”

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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH	Attendance Details		VAC-MCQ TEST		OVERALL MARK(100) (50% of A + 50% of B)
				No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	
1	811216105001	ATTCHAYA A K	IV/EEE	27	90	23	92	91
2	811216105003	BENAZIR M	IV/EEE	30	100	21	84	92
3	811216105004	GUNA SEELAN D	IV/EEE	27	90	22	88	89
4	811216105005	HARI GOWTHAM M	IV/EEE	30	100	20	80	90
5	811216105006	HARIHARAN B	IV/EEE	27	90	21	84	87
6	811216105007	ISWARYA K	IV/EEE	30	100	20	80	90
7	811216105008	KALISTA P	IV/EEE	27	90	21	84	87
8	811216105009	KHAJAMOINUDEEN S	IV/EEE	30	100	20	80	90
9	811216105010	KIRUTHIKA B	IV/EEE	30	100	19	76	88
10	811216105011	LOURDHU MARY D	IV/EEE	30	100	20	80	90
11	811216105012	MARIA SHOBANA J	IV/EEE	30	100	21	84	92



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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH	Attendance Details		VAC-MCQ TEST		OVERALL MARK(100) (50% of A + 50% of B)
				No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	
12	811216105014	MERLIN REETA P	IV/EEE	27	90	20	80	85
13	811216105015	NIROSHINI R	IV/EEE	27	90	19	76	83
14	811216105016	NITHING A	IV/EEE	27	90	19	76	83
15	811216105017	PAVENTHAN A	IV/EEE	27	90	19	76	83
16	811216105018	PRAVEEN KUMAR M	IV/EEE	30	100	20	80	90
17	811216105019	PRISILLA PRIYANKA	IV/EEE	27	90	21	84	87
18	811216105020	RAJA V	IV/EEE	27	90	22	88	89
19	811216105021	RATHINA RAJ R	IV/EEE	30	100	20	80	90
20	811216105023	RESHMI D	IV/EEE	27	90	21	84	87
21	811216105024	ROOBINI S	IV/EEE	27	90	20	80	85
22	811216105025	SURESH K	IV/EEE	27	90	21	84	87
23	811216105026	SURIYA PRAKASH K	IV/EEE	30	100	20	80	90
24	811216105027	TAMILARASAN M	IV/EEE	30	100	21	84	92
25	811216105028	TAMILAZHAGAN M	IV/EEE	30	100	20	80	90
26	811216105029	VINOTH R	IV/EEE	30	100	21	84	92
27	811216105302	PARKAVI S	IV/EEE	27	90	20	80	85
28	811217105005	ARUL JOY ASHA A	III/EEE	27	90	19	76	83



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				No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	
29	811217105006	ARUN SEBASTIN P	III/EEE	27	90	19	76	83
30	811217105007	BHARTHASARATHI M	III/EEE	27	90	20	80	85
31	811217105008	CHITHRA P	III/EEE	30	100	21	84	92
32	811217105009	DEEPIKA G	III/EEE	27	90	22	88	89
33	811217105010	EZHUMALAI A	III/EEE	24	80	21	84	82
34	811217105011	GAYATHRI K	III/EEE	27	90	20	80	85
35	811217105012	GAYATHRI S	III/EEE	30	100	21	84	92
36	811217105013	KANIMOZHI S	III/EEE	27	90	19	76	83
37	811217105014	KEERTHANA S	III/EEE	30	100	19	76	88
38	811217105015	KUMARIVALLI T	III/EEE	30	100	20	80	90
39	811217105016	MADHUMITHA S	III/EEE	30	100	21	84	92
40	811217105017	MANO K	III/EEE	27	90	21	84	87
41	811217105018	MEKALA M	III/EEE	27	90	20	80	85
42	811217105020	PAVITHRA S	III/EEE	27	90	21	84	87
43	811217105021	PRAVEEN RAJ R	III/EEE	30	100	20	80	90
44	811217105022	RAJASEKAR.N V	III/EEE	27	90	19	76	83
45	811217105023	REVATHI P	III/EEE	30	100	21	84	92



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S.NO	REG NO	STUDENTS NAME	YEAR/ BRANCH	Attendance Details		VAC-MCQ TEST		OVERALL MARK(100) (50% of A + 50% of B)
				No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	
46	811217105024	RISHON GURU M	III/EEE	30	100	21	84	92
47	811217105026	SANTHOSH K	III/EEE	27	90	22	88	89
48	811217105027	SRIKUMAR M S	III/EEE	27	90	20	80	85
49	811217105028	SRI LOGESH C	III/EEE	27	90	20	80	85
50	811217105029	SUBHA T	III/EEE	27	90	21	84	87
51	811217105031	VALARMATHI C	III/EEE	30	100	22	88	94
52	811217105032	VISWANATH R	III/EEE	27	90	19	76	83
53	811217105301	SANJEEV KUMAR R	III/EEE	30	100	21	84	92
54	811218105001	ARUN PRAVEEN RAJ A	II/EEE	27	90	20	80	85
55	811218105002	HARIHARAN M	II/EEE	30	100	21	84	92
56	811218105003	INBARAJ A	II/EEE	27	90	20	80	85
57	811218105004	JEYA STEPHEN S	II/EEE	30	100	19	76	88
58	811218105005	MANIKANDAN N	II/EEE	30	100	20	80	90
59	811218105006	PADMANABAN A	II/EEE	30	100	21	84	92
60	811218105007	SASIKUMAR R	II/EEE	27	90	21	84	87
61	811218105008	SIVAKUMAR P	II/EEE	27	90	20	80	85
62	811218105009	VEERA RAGAVAN A	II/EEE	27	90	21	84	87



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				No. of Hours Attended	Attendance Mark(100) (A)	No of Correct Answers	MCQ Mark(100) (B)	
63	811218105010	YUVARAJ S	II/EEE	30	100	20	80	90

  
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IG Valley Main Road  
Manika -620 012.

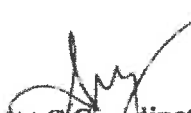




# Indra Ganesan

**COLLEGE OF ENGINEERING**

Medurai Main Road (NH-45B), Manikandam, Tiruchirappalli - 620 012  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai  
NAAC Accredited, 2(F) Status Institution by UGC



<b>Report on Value Added Course</b>					
Title:	"Smart Grid Technology"				
Resource Persons:	K. Marimuthu, Senior Project Trainer, Smart Power Care, Thillai Nagar, Trichy.				
Date of conduct from :	20.07.2020	To:	24.07.2020	Duration:	30 Hours
Organized Department :	Electrical and Electronics Engineering				
Participant Year:	2,3,4	No. of Students Registered :	63		
Venue:	online mode Google Meet: <a href="https://meet.google.com/hbp-aczr-dge">https://meet.google.com/hbp-aczr-dge</a>				
<b>Outcome of Value Added Course (VAC): At the end of the Course, Students can able to</b>					
<ol style="list-style-type: none"><li>1. Know the fundamental element of the smart grid and power grid.</li><li>2. Understand different communication technologies used in smart grids.</li><li>3. Get accustomed with the fundamentals of SCADA and IED</li><li>4. Understand the Importance of Automation in Substation and substation Automation.</li><li>5. Understand the Energy management systems in era of smart grid.</li><li>6. Understand the distribution automation for smart grid development.</li></ol>					
<b>Assessment Process</b>					
<ul style="list-style-type: none"><li>• Students, who are securing more than 70% on total score and secured more than 75% in attendance is eligible to receive the certificate for the VAC course conducted</li><li>• Total Score = (0.5 * Attendance in VAC out of 100 percentage + 0.5 * Test mark in VAC out of 100 marks)</li></ul>					
 VAC Coordinator		 HoD/EEE		 Principal	

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

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

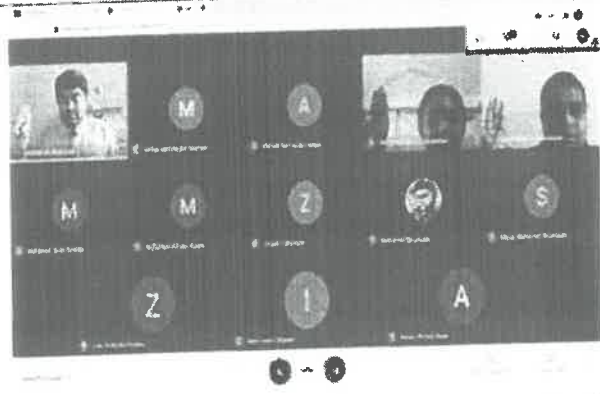





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<u>Sample Photos of Value Added Course</u>			
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<u>Sample Photos</u>			
			
 KAC Coordinator	 HoD/EEE	 Principal	

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

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## CERTIFICATE OF PARTICIPATION

This is to certify that Mr. PADMANABAN A, III Year, EEE has successfully completed the Value Added Course on “Smart Grid Technology” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Smart Power Care from 20<sup>th</sup> July 2020 to 24<sup>th</sup> July 2020 (5days) during the Academic year 2019-2020.

  
**Smart Power Care**  
**Mr. R. BHASKAR**  
**Chief Executive Officer.**

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

  
**Principal**  
**IGCE**





**Indra Ganesan**  
**COLLEGE OF ENGINEERING**  
Madurai Main Road (NH-45B), Manikandam, Trichy-12.  
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## CERTIFICATE OF PARTICIPATION

This is to certify that Ms. MEKALA M, III Year, EEE has successfully completed the Value Added Course on “Smart Grid Technology” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Smart Power Care from 20<sup>th</sup> July 2020 to 24<sup>th</sup> July 2020 (5days) during the Academic year 2019-2020.

  
Smart Power Care  
**Mr. R. BHASKAR**  
Chief Executive Officer.

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

  
Principal  
IGCE



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## CERTIFICATE OF PARTICIPATION

This is to certify that Ms. PARKAVI S, IV Year, EEE has successfully completed the Value Added Course on “Smart Grid Technology” organized by Department of Electrical & Electronics Engineering and IQAC of our Institution in Association with Smart Power Care from 20<sup>th</sup> July 2020 to 24<sup>th</sup> July 2020 (5days) during the Academic year 2019-2020.

Smart Power Care

**Mr. R. BHASKAR**

**Chief Executive Officer.**

Principal

**IGCE**

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

Principal

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IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.