GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

Course Tittle: _____Solar Wind Energy Systems _____

Following documents are available in Course File.

S.No.	Points	Yes	No
1	Institute and Department Vision and Mission Statements	√	
2	PEO & PO Mapping	√	
3	Academic Calendar	√	
4	Subject Allocation Sheet	√	
5	Class Time Table, Individual Timetable (Single Sheet)	√	
6	Syllabus Copy	√	
7	Course Handout	√	
8	CO-PO Mapping	√	
9	CO-Cognitive Level Mapping	√	
10	Lecture Notes	√	
11	Tutorial Sheets With Solution	√	
12	Soft Copy of Notes/Ppt/Slides	√	
13	Sessional Question Paper and Scheme of Evaluation	√	
14	Best, Average and Weak Answer Scripts for Each Sessional Exam. (Photocopies)	√	
15	Assignment Questions and Solutions	√	
16	Previous University Question Papers	√	
17	Result Analysis	√	
18	Feedback From Students	√	
19	Course Exit Survey		√
20	CO Attainment for All Mids.	√	
21	Remedial Action.		√

Course Instructor / Course Coordinator

(Name)

Course Instructor / Course Coordinator

(Signature)

Department/Program-EEE

Vision of the Institute

To be among the best of the institutions for engineers and technologists with attitudes, skills and knowledge and to become an epicentre of creative solutions.

Mission of the Institute

To achieve and impart quality education with an emphasis on practical skills and social relevance.

Vision of the Department

To impart technical knowledge and skills required to succeed in life, career and help society to achieve self sufficiency.

Mission of the Department

- To become an internationally leading department for higher learning.
- To build upon the culture and values of universal science and contemporary education.
- To be a centre of research and education generating knowledge and technologies which lay groundwork in shaping the future in the fields of electrical and
- electronics engineering.
- To develop partnership with industrial, R&D and government agencies and actively participate in conferences, technical and community activities.

Programme Educational Objectives (B.Tech. – EEE)

This programme is meant to prepare our students to professionally thrive and to lead.

During their progression:

Graduates will be able to

PEO 1: Have a successful technical or professional careers, including supportive and leadership roles on multidisciplinary teams.

PEO 2: Acquire, use and develop skills as required for effective professional practices.

PEO 3: Able to attain holistic education that is an essential prerequisite for being a responsible member of society.

PEO 4: Engage in life-long learning, to remain abreast in their profession and be leaders in our technologically vibrant society.

Programme Outcomes (B.Tech. – EEE)

At the end of the Programme, a graduate will have the ability to

PO 1: Apply knowledge of mathematics, science, and engineering.

PO 2: Design and conduct experiments, as well as to analyze and interpret data.

PO 3: Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

PO 4: Function on multi-disciplinary teams.

PO 5: Identify, formulates, and solves engineering problems.

PO 6: Understanding of professional and ethical responsibility.

PO 7: Communicate effectively.

PO 8: Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

PO 9: Recognition of the need for, and an ability to engage in life-long learning.

PO 10: Knowledge of contemporary issues.

PO 11: Utilize experimental, statistical and computational methods and tools necessary for engineering practice.

PO 12: Demonstrate an ability to design electrical and electronic circuits, power electronics, power systems; electrical machines analyze and interpret data and also an ability to design digital and analog systems and programming them.

PEOs & POs Mapping

Programme Educational Objectives (PEOs)	Programme Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	M	M	-	-	H	-	-	H	H	-	H	H
2	-	-	M	M	H	H	H	-	-	-	-	H
3	-	-	-	-	H	H	M	M	M	M	H	H
4	-	-	-	M	M	H	M	H	H	-	M	H

* H: Strongly Correlating (3); M: Moderately Correlating (2)& L: Weakly Correlating (1)

Name of the Course: SOLAR AND WIND ENERGY

COURSE EDUCATIONAL OBJECTIVES:

The objective of this course is to provide

- Introduction of the basic concepts of solar and wind energies.
- Knowledge on the solar power extraction and collection.
- Information and installation of wind and photo voltaic systems.
- Knowledge of PV solar panels and wind generators.
- Applications of wind and solar power technologies for hybrid power generation

COURSE OUTCOMES:

At the end of the course student will have ability to:

- Explain the principles that underlie the ability of various natural phenomena to deliver solar energy.
- Outline the technologies that are used to harness the power of solar energy.
- Discuss the positive and negative aspects of solar energy in relation to natural and human aspects of the environment.
- Explain the principles that underlie the ability of various natural phenomena to deliver wind energy.
- Outline the technologies that are used to harness the power of wind energy.
- Discuss the positive and negative aspects of wind energy in relation to natural and human aspects of the environment.
- Know about the usage of both wind and solar power for hybrid power generation.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

GRIET/DAA/1H/G/18-19 05 May 2018

ACADEMIC CALENDAR

Academic Year 2018-19

III B.TECH – FIRST SEMESTER

S. No.	EVENT	PERIOD	DURATION
1	1st Spell of Instructions	02-07-2018 to 01-09-2018	9 Weeks
2	1st Mid-term Examinations	03-09-2018 to 05-09-2018	3 Days
3	2nd Spell of Instructions	06-09-2018 to 24-10-2018	7 Weeks
4	2nd Mid-term Examinations	25-10-2018 to 27-10-2018	3 Days
5	Preparation	29-10-2018 to 06-11-2018	1 Week 3 Days
6	**End Semester Examinations (Theory/ Practicals) Regular/Supplementary**	**08-11-2018 to 08-12-2018**	**4 Weeks 3 Days**
7	Commencement of Second Semester, A.Y 2018-19	10-12-2018	

III B.TECH – SECOND SEMESTER

S. No.	EVENT	PERIOD	DURATION
1	1st Spell of Instruction	10-12-2018 to 02-02-2019	8 Weeks
2	1st Mid-term Examinations	04-02-2019 to 06-02-2019	3 Days
3	2nd Spell of Instruction	07-02-2019 to 06-04-2019	**8 Weeks 3 Days**
4	2nd Mid-term Examinations	08-04-2019 to 10-04-2019	3 Days
5	Preparation	11-04-2019 to 17-04-2019	1 Week
6	**End Semester Examinations (Theory/ Practicals) Regular**	18-04-2019 to 08-05-2019	3 Weeks
7	**Supplementary and Summer Vacation**	**09-05-2019 to 22-06-2019**	**6 Weeks 3 Days**
8	Commencement of First Semester, A.Y 2019-20	24-06-2019	

Copy to Director, Principal, Vice Principal, DOA, DOE, Balaji Kumar, DCGC, All HODs

(2018-19) I- Sem Subject Allocation Sheet

	Section-A	Section-B
Special Functions and Complex Variable	Dr GS	Dr GS
Electromagnetic Fields	SN	SN
Network Theory	MS	MS
DC Machines and Transformers	Dr BPB	Dr BPB
Computer Organization	PRK	PRK
DC Machines Lab	MP/DSR	PRK/DSR
Electrical Networks Lab	YSV/GBR	YSV/GBR
Electrical Simulation Lab	GSR/PS	GSR/PS
Environmental Science		
III YEAR (GR15)	Section-A	Section-B
Power Transmission System	VVRR/MP	VVRR/MP
Microcontrollers	PK	PK
Power Electronics	Dr TSK	DKK
Electrical Measurements& Instrumentation (PE-1)	UVL	UVL
Solar & Wind Energy Systems (OE-1)	PSVD/Dr JP	PSVD/Dr JP
Sensors/Measurements& Instrumentation Lab	PSVD/PS	UVL/PS
Power Electronics Lab	PPK/MRE	SN/MRE
Microcontrollers Lab	RAK/DKK	PK/DKK
IV YEAR(GR15)	Section-A	Section-B
Power Semiconductor Drives	YSV	Dr DGP
Power System Operation & Control	Dr JSD	Dr JSD

High Voltage DC Transmission Systems	MRE	Dr SVJK
Electrical Distribution Systems (PE-3)	VVSM	
High Voltage Engineering (PE-3)	VUR	
Soft Computing Techniques (OE-3)	RAK	RAK
DSP based Electrical Lab	AVK/DKK	AVK/DKK
Power Systems Simulation Lab	VVSM / GSR	VVSM / GSR
Power Electronic Drives Lab	MP/GBR	MP/GBR
I/I BEE(AICTE)	A/B	C/D/E
BEE	ML	
BEE	KS	
BEE	MK	
BEE	MVK	
BEE	MNSR	
Civil II/I (GR15)	A	B
ET	PPK	PPK

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

CLASS TIME TABLE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

GRIET/PRIN/06/G/01/18-19 **Wef : 02 July 2018**

BTech - EEE - A **III year - I Semester**

DAY/ HOUR	9:00 - 9:45	9:45 - 10:30	10:30 - 11:15	11:15- 12:00	12:00- 12:30	12:30 - 1:20	1:20 - 2:10	2:10 - 3:00
MONDAY	PE		SWE		BREAK	MC	PE	PE
TUESDAY	SMI Lab / PE Lab A1 / A2					SWE	PE	PE
WEDNESDAY	PTS		SWE			MC	MC	EMI
THURSDAY	PE Lab / MC Lab A1 / A2					PTS	PTS	EMI
FRIDAY	MC Lab /SMI Lab A1 / A2					EMI	EMI	MC
SATURDAY	MC		PTS			SWE	EMI	EMI

Room No	
Theory	4501
Lab	SMI Lab - 4507 MC Lab - 4505 PE Lab - 4405
Class Incharge:	M Lohita

Subject Code	Subject Name	Faculty Code	Faculty name	Almanac	
GR15A3016	Power Transmission System	VVRR/MP	V Vijaya Rama Raju/M Prashanth	1st Spell of Instructions	02-07-2018 to 01-09-2018
GR15A2055	Microcontrollers	PK	P Prashanth	1st Mid-term Examinations	03-09-2018 to 05-09-2018
GR15A3018	Power Electronics	Dr TSK	Dr T Suresh Kumar	2nd Spell of Instructions	06-09-2018 to 24-10-2018
GR15A3017	Electrical Measurements and Instrumentation	UVL	U Vijaya Lakshmi	2nd Mid-term Examinations	25-10-2018 to 27-10-2018
GR15A3152	Solar & Wind Energy Systems	PSVD/Dr JP	P Sri Vidya Devi/Dr J Praveen	Preparation	29-10-2018 to 06-11-2018
GR15A3019	Sensors/Measurements and Instrumentation Lab	PSVD/PS	P Sri Vidya Devi /P Sirisha	End Semester Examinations (Theory/ Practicals) Regular / Supplementary	08-11-2018 to 08-12-2018
GR15A3020	Power Electronics Lab	PPK/MRE	P Praveen Kumar/M Rekha		
GR15A2059	Microcontrollers Lab	RAK/DKK	R Anil Kumar/ D Karuna Kumar	Commencement of Second Semester, A.Y	10/12/2018

HOD **Co-ordinator** **DAA**

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Wef : 02 July 2018

GRIET/PRIN/06/G/01/18-19

Wef

BTech - EEE - B

III year - I Semester

DAY/ HOUR	9:00 - 9:50	9:50 - 10:40	10:40 - 11:30	11:30 - 12:00	12:00-12:45	12:45-1:30	1:30 - 2:15	2:15 - 3:00
MONDAY	PE	PE	MC	BREAK	SMI Lab / PE Lab B1/ B2			
TUESDAY	PE	PE	MC		MCLab / SMI Lab B1/ B2			
WEDNESDAY	PE	PE	PTS		EMI		SWE	
THURSDAY	PTS	PTS	EMI		SWE		MC	
FRIDAY	PTS	PTS	EMI		MC		SWE	
SATURDAY	PTS	EMI	EMI		PELab / MC Lab B1/ B2			

Room No	
Theory	4404
Lab	SMI Lab - 4507 MC Lab - 4505 PE Lab - 4405

Class Incharge:	M Lohita

Subject Code	Subject Name	Faculty Code	Faculty name	Almanac	
GR15A3016	Power Transmission System	VVRR/MP	V Vijaya Rama Raju/M Prashanth	1st Spell of Instructions	02-07-2018 to 01-09-2018
GR15A2055	Microcontrollers	PK	P Prashanth	1st Mid-term Examinations	03-09-2018 to 05-09-2018
GR15A3018	Power Electronics	DKK	D Karuna Kumar	2nd Spell of Instructions	06-09-2018 to 24-10-2018
GR15A3017	Electrical Measurements and Instrumentation	UVL	U Vijaya Lakshmi	2nd Mid-term Examinations	25-10-2018 to 27-10-2018
GR15A3152	Solar & Wind Energy Systems	PSVD/Dr JP	P Sri Vidya Devi/Dr J Praveen	Preparation	29-10-2018 to 06-11-2018
GR15A3019	Sensors/Measurements and Instrumentation Lab	UVL/PS	U Vijaya Lakshmi/ P Sirisha	End Semester Examinations (Theory/ Practicals) Regular / Supplementary	08-11-2018 to 08-12-2018
GR15A3020	Power Electronics Lab	SN/MRE	Syed Sarfaraz Nawaz/ M Rekha		
GR15A2059	Microcontrollers Lab	PK/DKK	P Prashanth Kumar/ D Karuna Kumar	Commencement of Second Semester, A.Y	10/12/2018

Syllabus – SOLAR AND WIND ENERGY

UNIT-I

Solar Energy Basics: The sun as a source of energy, The Earth Sun, Earth Radiation Spectrums, Extra-terrestrial and Terrestrial Radiations, Spectral Energy Distribution of Solar Radiation, Depletion of Solar Radiation, Solar Radiation Data, Measurement of Solar Radiation, Solar Time(Local Apparent Time), Solar Radiation Geometry, Solar Day Length, Empirical Equations for Estimating Solar Radiation Availability on Horizontal Surface For Cloudy skies, Hourly Global, Diffuse and Beam Radiation on Horizontal Surface Under Cloudless Skies, Solar Radiation on Inclined Plane Surface

UNIT-II

Solar Thermal Systems: Solar Collectors, Solar Water Heater, Solar Passive Space-Heating and Cooling Systems, Solar Ustrial Heating Systems, Solar Refrigeration and Air-Conditioning Systems, Solar Cookers, Solar Furnaces, Solar Green House, Solar Dryer, Solar Distillation(or Desalination of Water), Solar Thermo-Mechanical Systems. 17 GR17 Regulations (GR17-18)

UNIT-III

Solar Photovoltaic Systems: Solar Cell Fundamentals, Solar Cell Characteristics, Solar Cell Classification, Solar Cell, Module, Panel and Array Construction, Maximizing The Solar PV Output and Load Matching, Maximizing Power point tracker(MPPT),Balance of System Components, Solar PV Systems, Solar PV Applications

UNIT-IV

Wind Energy: Origin of Winds, Nature of Winds, Wind Turbine Siting, Major Applications of Wind Power, Basics of Fluid Mechanics, Wind Turbine Aerodynamics.

UNIT-V

Wind Energy Conversion Systems: Wind Energy Conversion Systems (WECS), Wind-Diesel Hybrid System, Effects of Wind Speed and Grid Condition (System Integration), Wind Energy Storage, Environmental Aspects

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Department of Electrical & Electronics Engineering

GUIDELINES TO STUDY THE COURSE/SUBJECT

Academic **Y**ear : 2018-2019

Semester : I

Name of the Program:….EEE**…**… B.Tech……**……**..… Section:A&B

Course/Subject: …… SOLAR AND WIND ENERGY…… Code…GR15D5044……

Name of the Faculty:……..J. PRAVEEN & P.SRIVIDYADEVI.. Dept.: ……EEE……

Designation: .PROFESSOR& ASST.PROFESSOR
Guidelines to study the Course/ Subject: SOLAR AND WIND ENERGY

Course Design and Delivery System (CDD):

- The Course syllabus is written into number of learning objectives and outcomes.
- These learning objectives and outcomes will be achieved through lectures, assessments, assignments, experiments in the laboratory, projects, seminars, presentations, etc.
- Every student will be given an assessment plan, criteria for assessment, scheme of evaluation and grading method.
- The Learning Process will be carried out through assessments of Knowledge, Skills and Attitude by various methods and the students will be given guidance to refer to the text books, reference books, journals, etc.

The faculty be able to –

- Understand the principles of Learning
- Understand the psychology of students
- Develop instructional objectives for a given topic
- Prepare course, unit and lesson plans
- Understand different methods of teaching and learning
- Use appropriate teaching and learning aids
- Plan and deliver lectures effectively
- Provide feedback to students using various methods of Assessments and tools of Evaluation
- Act as a guide, advisor, counselor, facilitator, motivator and not just as a teacher alone

Signature of HOD
Date:

Signature of faculty
Date:

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

COURSE SCHEDULE

Academic **Y**ear : 2018-2019

Semester : I

Name of the Program:……EEE**…**… B.Tech……..… Section:A&B

Course/Subject: …SOLAR AND WIND ENERGY……..Code:…GR15D5044……

Name of the Faculty: …….J. PRAVEEN & PSVD

Designation: PROFESSOR& ASST.PROFESSOR

The Schedule for the whole Course / Subject is:

S. No.	Description	Total No. Of Periods
1.	**Solar Energy Basics**: The sun as a source of energy, The Earth Sun, Earth Radiation Spectrums, Extra-terrestrial and Terrestrial Radiations, Spectral Energy Distribution of Solar Radiation, Depletion of Solar Radiation, Solar Radiation Data, Measurement of Solar Radiation, Solar Time(Local Apparent Time), Solar Radiation Geometry, Solar Day Length, Empirical Equations for Estimating Solar Radiation Availability on Horizontal Surface For Cloudy skies, Hourly Global, Diffuse and Beam Radiation on Horizontal Surface Under Cloudless Skies, Solar Radiation on Inclined Plane Surface	12
2.	**Solar Thermal Systems**: Solar Collectors, Solar Water Heater, Solar Passive Space-Heating and Cooling Systems, Solar Ustrial Heating Systems, Solar Refrigeration and Air-Conditioning Systems, Solar Cookers, Solar Furnaces, Solar Green House, Solar Dryer, Solar Distillation(or Desalination of Water), Solar Thermo-Mechanical Systems. 17 GR17	10

	Regulations (GR17-18)	
3.	**Solar Photovoltaic Systems**: Solar Cell Fundamentals, Solar Cell Characteristics, Solar Cell Classification, Solar Cell, Module, Panel and Array Construction, Maximizing The Solar PV Output and Load Matching, Maximizing Power point tracker(MPPT),Balance of System Components, Solar PV Systems, Solar PV Applications	10
4.	**Wind Energy**: Origin of Winds, Nature of Winds, Wind Turbine Siting, Major Applications of Wind Power, Basics of Fluid Mechanics, Wind Turbine Aerodynamics.	8
5.	**Wind Energy Conversion Systems**: Wind Energy Conversion Systems (WECS), Wind-Diesel Hybrid System, Effects of Wind Speed and Grid Condition (System Integration), Wind Energy Storage, Environmental Aspects	10

Total No. of Instructional periods available for the course: ….50…….Hours / Periods

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

SCHEDULE OF INSTRUCTIONS COURSEPLAN

Academic **Y**ear : 2018-2019

Semester : I

Name of the Program:……EEE**…**…. B.Tech….**……** Section: A&B

Course/Subject: ……SOLAR AND WIND ENERGY……Code:… GR15A3152 ……

TEXT BOOK 1: B.H.KHAN , "**NON- CONVENCTIONAL ENERGY RESOURCES**"

Unit No.	Lesson No.	No. of Periods	Topics / Sub-Topics	Objectives & Outcomes Nos.	References (Text Book, Journal…) Page Nos.: ____to ____
1	1.	1	**Solar Energy Basics**	1&1	T1: 118
1	2.	2	The sun as a source of energy, The Earth Sun, Earth Radiation Spectrums	1&1	T1: 119 TO 120
1	3.	1	Extra-terrestrial and Terrestrial Radiations	1&1	T1: 121
1	4.	2	Spectral Energy Distribution of Solar Radiation, Depletion of Solar Radiation,	1&1	T1:122 to 123
1	5.	2	Solar Radiation Data, Measurement of Solar Radiation	1&1	T1:125 to 129
1	6	2	Solar Time(Local Apparent Time), Solar Radiation Geometry, Solar Day Length, Empirical Equations for Estimating Solar Radiation Availability on Horizontal Surface For Cloudy skies,	1&2	T1: 130 to 138
1	7.	2	Hourly Global, Diffuse and Beam Radiation on Horizontal Surface Under Cloudless Skies, Solar Radiation on Inclined Plane Surface	1&2	T1: 144
2	1	1	**Solar Thermal Systems**	2&2	T1: 153
2	2	2	Solar Collectors, Solar Water Heater,	2&3	T1: 153 to 170
2	3	1	Solar Passive Space-Heating and Cooling Systems,	2&3	T1: 171 to 174
2	4	2	Solar Ustrial Heating Systems,	2&3	T1: 175 to 178

			Solar Refrigeration and Air-Conditioning Systems		
2	5	2	Solar Cookers, Solar Furnaces, Solar Green House, Solar Dryer	3&1	T1:179 to 188
2	6	2	Solar Distillation(or Desalination of Water), Solar Thermo-Mechanical Systems.	3&2	T1: 189 to 195
3	1	2	**Solar Photovoltaic Systems**	3&3	T1: 221
3	2	1	Solar Cell Fundamentals, Solar Cell Characteristics	3&3	T1: 222 to 245
3	3	2	Solar Cell Classification, Solar Cell, Module, Panel and Array Construction	3&2	T1: 246 to 254,262
3	4	1	Maximizing The Solar PV Output and Load Matching,	1&3	T1:268
3	5	2	Maximizing Power point tracker(MPPT)	1&3	T1: 269
3	6	2	Balance of System Components, Solar PV Systems, Solar PV Applications	1&3	T1:272 to 292
4	1	1	**Wind Energy**	2&3	T1: 299
4	2	2	Origin of Winds	2&3	T1: 300 to 302
4	3	2	Nature of Winds	2&3	T1: 302 to 311
4	4	1	Wind Turbine Siting	3&4	T1: 312
4	5	1	Major Applications of Wind Power	3&4	T1: 312
4	6	1	Basics of Fluid Mechanics, Wind Turbine Aerodynamics	4&5	T1: 313 to 322
5	1	2	**Wind Energy Conversion Systems**	4&5	T1: 338
5	2	2	Wind Energy Conversion Systems (WECS),	4&5	T1 : 339 to 341
5	3	2	Wind-Diesel Hybrid System,	3&4	T1: 342
5	4	2	Effects of Wind Speed and Grid Condition (System Integration)	3&5	T1: 344
5	5	2	Wind Energy Storage, Environmental Aspects	3&5	T1:344 to 346

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

COURSE OBJECTIVES

Academic **Y**ear :2018-19

Semester : **II**

Name of the Program: EEE…… Year:B.Tech III**……**..… Section:A/B

Course/Subject: ……Switch Gear and Protection…… CourseCode: **GR15A3022**

Name of the Faculty: Dr. J.Praveen,P.Srividyadevi Dept.EEE:……

Designation: PROFESSOR ,ASST.PROFESSOR

On completion of this Subject/Course the student shall be able to:

S.No	**Objectives**

Course Objectives:

1. Graduates will be able to explain the Principles that underlie the ability of various natural phenomena to deliver solar energy

2. Graduates will be able to outline the technologies that are used to harness the power of solar energy

3. Discuss the positive and negative aspects of solar energy in relation to natural and human aspects of the environment

4. Graduates will be able to explain the Principles that underlie the ability of various natural phenomena to deliver wind energy

5. Graduates will be able to outline the technologies that are used to harness the power of Wind energy

6. Discuss the positive and negative aspects of Wind energy in relation to natural and human aspects of the environment

7. Will able to know about the usage of both wind and solar power for hybrid power generation

Signature of HOD Signature of faculty

Date: Date:

Note: Please refer to Bloom's Taxonomy, to know objectives.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

COURSE OUTCOMES

Academic **Y**ear :2018-19

Semester : **II**

Name of the Program:EEE…… Year:B.Tech III…….…… Section: A/B

Course/Subject: Switch Gear and Protection CourseCode: **GR15A3022**

Name of the Faculty: Dr. J.Praveen,P.Srividyadevi, Dept.: ……EEE……

Designation: PROFESSOR ,ASST.PROFESSOR

The expected outcomes of the Course/Subject are:

Course Outcomes

1. Introduction of the basic concepts of Solar and Wind Energies
2. Knowledge on the solar power extraction and collection
3. Information and installation of Photo voltaic systems
4. Information and installation of wind systems
5. Knowledge of PV Solar Panels
6. Knowledge of wind generators
7. Applications of wind and Solar power technologies for hybrid power generation.

Signature of HOD Signature of faculty

Date: Date:

Note: Please Taxonomy, refer to know to the Bloom's illustrative verbs that can be used to state the outcomes.

CO-PO Mapping

Cognitive Level Mapping

Cognitive Learning Levels

COs

	1	**2**	**3**	**4**	**5**	**6**
1					√	
2			√			
3				√		
4						√
						√
5						
6					√	
7						√

Cognitive Learning Level

CLL 1: Remembering

CLL 2: Understanding

CLL 3: Applying

CLL 4: Analyzing

CLL 5: Evaluating

CLL 6: Creating

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

ASSIGNMENT SHEET –1

Academic **Y**ear : 2018-2019

Semester : I UNIT NO.1

Name of the Program:….EEE…… B.Tech…….…Section: A&B

Course/Subject: SOLAR AND WIND ENERGY……..…..Code:… GR15A3152 ……
Name of the Faculty: J. PRAVEEN &
P.SRIVIDYADEVI Dept:…EEE.……

Designation: PROFESSOR& ASST.PROFESSOR.

Q1.Explain about solar radiation data and solar geomentry?

Q2.What are the empirical equations for estimating solar radiation availability on horizontal surface?

Q3.Explain about the beam and diffuse radiation on horizontal surface?

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.:
……1…….

Outcome Nos.:
……1…….

Signature of HOD Signature of faculty

Date: Date:

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

ASSIGNMENT SHEET –2

Academic **Y**ear : 2018-2019

Semester : I UNIT NO.2

Name of the Program:….EEE…… B.Tech…….…Section: A&B

Course/Subject: SOLAR AND WIND ENERGY……..…..Code:… GR15A3152 ……
Name of the Faculty: J. PRAVEEN &
P.SRIVIDYADEVI Dept:…EEE.……

Designation: PROFESSOR& ASST.PROFESSOR.

Q1.Explain about solar space-heating and cooling systems?

Q2.Explain about solar –thermo mechanical systems?

Q3.Explain about solar cookers, solar furnaces and solar dryer?

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.:
……3…….

Outcome Nos.:
……2…….

Signature of HOD Signature of faculty

Date: Date:

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

ASSIGNMENT SHEET –3

Academic **Y**ear : 2018-2019

Semester : I UNIT NO.3

Name of the Program:….EEE…… B.Tech…….…Section: A&B

Course/Subject: SOLAR AND WIND ENERGY……..…..Code:… GR15A3152 ……
Name of the Faculty: J. PRAVEEN &
P.SRIVIDYADEVI Dept:…EEE.……

Designation: PROFESSOR& ASST.PROFESSOR.

Q1.Explain about and solar cell classification and draw the charactestics of solar cell?

Q2.Explain about maximum power point tracking techniques(MPPT)?

Q3.Write some of the applications of solar cell?

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.:
……3…….

Outcome Nos.:
……4…….

Signature of HOD Signature of faculty

Date: Date:

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

ASSIGNMENT SHEET –4

Academic **Y**ear : 2018-2019

Semester : I UNIT NO.4

Name of the Program:….EEE…… B.Tech…….…Section: A&B

Course/Subject: SOLAR AND WIND ENERGY……..…..Code:… GR15A3152 ……
Name of the Faculty: J. PRAVEEN &
P.SRIVIDYADEVI Dept:…EEE.……

Designation: PROFESSOR& ASST.PROFESSOR.

Q1.List out major applications of wind power?

Q2.Explain about origin and nature of winds?

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.:
……3…….

Outcome Nos.:
……2…….

Signature of HOD Signature of faculty

Date: Date:

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

ASSIGNMENT SHEET –5

Academic **Y**ear : 2018-2019

Semester : I UNIT NO.5

Name of the Program:….EEE…… B.Tech…….…Section: A&B

Course/Subject: SOLAR AND WIND ENERGY……..…..Code:… GR15A3152 ……
Name of the Faculty: J. PRAVEEN &
P.SRIVIDYADEVI Dept:…EEE.……

Designation: PROFESSOR& ASST.PROFESSOR.

Q1.Explain wind-diesel hybrid systems?

Q2.What are the effects of wind speed and grid condition?

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.:
……3…….

Outcome Nos.:
……2…….

Signature of HOD Signature of faculty

Date: Date:

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

TUTORIAL SHEET - 1

Academic **Y**ear : 2018-2019

Semester : I UNIT NO.1

Name of the Program:….EEE…… B.Tech…….…Section: A&B

Course/Subject: SOLAR AND WIND ENERGY……..…..Code:… GR15A3152 ……
Name of the Faculty: J. PRAVEEN &
P.SRIVIDYADEVI Dept:…EEE.……

Designation: ASSISTANT.PROFESSOR& ASST.PROFESSOR.

This Tutorial corresponds to01…….UnitNo/ Lesson

Q1.Explain about solar radiation on inclined plane?

Q2.Explain about solar radiation data and measurement of solar radiation?

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.:
……1…….

Outcome Nos.:
……1…….

Signature of HOD Signature of faculty

Date: Date:

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

TUTORIAL SHEET - 2

Academic **Y**ear : 2018-2019

Semester : I UNIT NO.2

Name of the Program:….EEE…… B.Tech…….…Section: A&B

Course/Subject: SOLAR AND WIND ENERGY……..…..Code:… GR15A3152 ……
Name of the Faculty: J. PRAVEEN &
P.SRIVIDYADEVI Dept:…EEE.……

Designation: PROFESSOR& ASST.PROFESSOR.

1. Explain about solar dryer and solar distillation?
2. Explain about solar refrigeration and cooling systems?

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.: 3

Outcome Nos.: 2

Signature of HOD Signature of faculty

Date: Date:

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

TUTORIAL SHEET - 3

Academic **Y**ear : 2018-2019

Semester : I UNIT NO.3

Name of the Program:….EEE…… B.Tech…….…Section: A&B

Course/Subject: SOLAR AND WIND ENERGY……..…..Code:… GR15A3152 ……

Name of the Faculty: J.PRAVEEN Dept:…EEE.……

Designation: PROFESSOR& ASST.PROFESSOR.

Q1. Explain about maximizing the solar PV output and load matching?

Q2. List out solar PV applications?

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.: 3
Outcome Nos.: 4

Signature of HOD Signature of faculty

Date: Date:

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

TUTORIAL SHEET - 4

Academic **Y**ear : 2018-2019

Semester : I UNIT NO.4

Name of the Program:….EEE…… B.Tech…….…Section: A&B

Course/Subject: SOLAR AND WIND ENERGY……..…..Code:… GR15A3152 ……
Name of the Faculty: J. PRAVEEN &
P.SRIVIDYADEVI Dept:…EEE.……

Designation: PROFESSOR& ASST.PROFESSOR.

1. Explain about wind turbine setting?

2. Explain about basics of fluid mechanics?

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.: 3
Outcome Nos.: 2

Signature of HOD Signature of faculty

Date: Date:

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

TUTORIAL SHEET - 5

Academic **Y**ear : 2018-2019

Semester : I UNIT NO.5

Name of the Program:….EEE…… B.Tech…….…Section: A&B

Course/Subject: SOLAR AND WIND ENERGY……..…..Code:… GR15A3152 ……
Name of the Faculty: J. PRAVEEN &
P.SRIVIDYADEVI Dept:…EEE.……

Designation: PROFESSOR& ASST.PROFESSOR.

1. Explain wind energy conversion systems?
2. Explain about wind storage and also its environmental aspects?

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.: 3

Outcome Nos.: 2

Signature of HOD Signature of faculty

Date: Date:

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electrical & Electronics Engineering

EVALUATION STRATEGY

Academic **Y**ear : 2018-2019

Semester : I UNIT NO.5

Name of the Program:….EEE…… B.Tech…….…Section: A&B

Course/Subject: SOLAR AND WIND ENERGY……..…..Code: GR15A3152 ……
Name of the Faculty: J. PRAVEEN &
P.SRIVIDYADEVI Dept:…EEE.……

Designation: PROFESSOR& ASST.PROFESSOR.

1. TARGET:

A) Percentage for pass:40%

b) Percentage of class:85%

2. COURSE PLAN& CONTENT DELIVERY

(Please write how you intend to cover the contents: i.e., coverage of Units/Lessons by lectures, design, exercises, solvingnumericalproblems, demonstrationofmodels,modelpreparation, experiments in the., orbyassignments,etc.)

3. METHOD OF EVALUATION
1. Continuous Assessment Examinations (CAE-I, CAE-II)
2. Assignments/Seminars
3. Quiz
4. Semester/End Examination

4. List out any new topic(s) or any innovation you would like to introduce in teaching the subjects in this Semester.

……..

Signature of HOD Signature of faculty

Date: Date: