



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	\checkmark	
2	PEO & PO Mapping	\checkmark	
3	Academic Calendar	\checkmark	
4	Subject Allocation Sheet	\checkmark	
5	Class Time Table, Individual Timetable (Single Sheet)	\checkmark	
6	Syllabus Copy	\checkmark	
7	Course Handout	\checkmark	
8	CO-PO Mapping	\checkmark	
9	CO-Cognitive Level Mapping	\checkmark	
10	Lecture Notes	\checkmark	
11	Tutorial Sheets With Solution	\checkmark	
12	Soft Copy of Notes/Ppt/Slides	\checkmark	
13	Sessional Question Paper and Scheme of Evaluation	\checkmark	
14	Best, Average and Weak Answer Scripts for Each Sessional Exam. (Photocopies)	\checkmark	
15	Assignment Questions and Solutions	\checkmark	
16	Previous University Question Papers	\checkmark	
17	Result Analysis	\checkmark	
18	Feedback From Students	\checkmark	
19	Course Exit Survey		
20	CO Attainment for All Mids.	\checkmark	
21	Remedial Action.		

Course Instructor / Course Coordinator

Course Instructor / Course Coordinator

(Name)

(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.



Department of Electrical & Electronics Engineering

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.

Programme Educational		Programme Outcomes (POs)										
Objectives (PEOs)	1	2	3	4	5	6	7	8	9	10	11	12
1	Μ	Μ	-	-	Н	-	-	Η	Н	-	Н	Н
2	-	-	Μ	М	Н	Н	Н	-	-	-	-	Н
3	-	-	-	-	Н	Н	Μ	Μ	Μ	М	Н	Н
4	-	-	-	Μ	Μ	Н	Μ	Н	Н	-	М	Н

PEOs & POs Mapping

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



Department of Electrical & Electronics Engineering

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.





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	1 st Spell of Instructions	02-07-2018 to 01-09-2018	9 Weeks
2	1 st Mid-term Examinations	03-09-2018 to 05-09-2018	3 Days
3	2 nd Spell of Instructions	06-09-2018 to 24-10-2018	7 Weeks
4	2 nd 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/	08-11-2018 to 08-12-2018	4 Weeks 3 Days
	Practicals) Regular/Supplementary		
7	Commencement of Second Semester,	10-12-2018	
	A.Y 2018-19		

III B.TECH – SECOND SEMESTER

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

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





	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	РК	РК
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

(2018-19) I- Sem Subject Allocation Sheet





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		
	VVSM /	VVSM /		
Power Systems Simulation Lab	GSR	GSR		
Power Electronic Drives Lab	MP/GBR	MP/GBR		
I/I BEE(AICTE)	A/B	C/D/E		
BEE	ML			
BEE	KS			
BEE	МК			
BEE	MVK			
BEE	MNSR			
Civil II/I (GR15)	А	В		
ET	РРК	РРК		





CLASS TIME TABLE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

GRIET/PRIN/06 BTech - EEE - A	6/G/01/18-1	9								Wef : 02 III year -	July 2018 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		Roo	om No
MONDAY	Pl	E		SWE		MC	PE	PE		Theory	4501
TUESDAY	SMI Lab / PE Lab A1 / A2				SWE	PE	PE		Lab	SMI Lab - 4507 MC Lab - 4505 PE Lab - 4405	
WEDNESDAY	РТ	TS .		SWE	BREA	MC	MC	EMI			
THURSDAY	PE Lab / MC Lab A1 / A2			K	PTS	PTS	EMI		Class Incharge:	M Lohita	
FRIDAY		MC La A	b /SMI La 1 / A2	b		EMI	EMI	МС			
SATURDAY	М	С		PTS		SWE	EMI	EMI			
Subject Code	Su	bject Nan	ne	Faculty Code	Fac	Faculty name		Almanac			
GR15A3016	Power	r Transmi System	ssion	VVRR/MP	V Vijaya Rama Raju/M Prashanth			1 st Spell of Instructions			02-07-2018 to 01-09- 2018
GR15A2055	Mic	Microcontrollers		PK	PF	Prashanth		1 st Mid-ter Examinati	m ons		03-09-2018 to 05-09- 2018
GR15A3018	Power Electronics Dr TSK		Dr TSK	Dr T Suresh Kumar			2 nd Spell of Instructions			06-09-2018 to 24-10- 2018	
GR15A3017	Electrical Measurements and Instrumentation UVL		U Vijaya Lakshmi			2 nd Mid-term Examinations			25-10-2018 to 27-10- 2018		
GR15A3152	Solar	& Wind E Systems	Wind Energy PSVD/Dr Systems JP		P Sri Vidya Devi/Dr J Praveen			Preparation			29-10-2018 to 06-11- 2018
GR15A3019	Sensors and Ins	s/Measure trumentat	ements ion Lab	PSVD/PS	P Sri Vidya	a Devi /P S	Sirisha	End Seme Examinati	ester ons	(Theory/	08-11-2018
GR15A3020	Power Electronics Lab		PPK/MRE	P Praveen	Kumar/M	Rekha	Practicals Suppleme) Re Intar	gular / y	2018 to 08-12-	
GR15A2059	Micro	Microcontrollers Lab RAK/DKK		R Anil Ku	R Anil Kumar/ D Karuna Kumar			Commencement of Second Semester A Y			

HOD

Co-ordinator

DAA



Department of Electrical & Electronics Engineering

DEPARTMENT OF ELECTRICAL AND ELECTRONICS

ENGINEERING GRIET/PRIN/06/G/01/18-19 BTech - EEE - B Wef : 02 July 2018

Wef

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		Roo	om No
MONDAY	PE	PE	мс		S	/ MI Lab B1/	' PE Lab B2			Theory	4404
TUESDAY	PE	PE	MC		N	MCLab / SMI Lab B1/ B2					SMI Lab - 4507 MC Lab -
WEDNESDAY	PE	PE	PTS	BREA	EM	I	S	WE		200	4505 PE Lab - 4405
THURSDAY	PTS	PTS	EMI	١K	SW	E	ı	ИС			
FRIDAY	PTS	PTS	EMI		МС	2	S	SWE		Class Incharge:	M Lohita
SATURDAY	PTS	EMI	EMI		F	PELab / M B1/	MC Lab B2				
Subject Code	Subject Name		Faculty Code	Faculty name			Almanac				
GR15A3016	Power Transmission System			VVRR/MP	V Vijaya Pr	/ijaya Rama Raju/M Prashanth 1 st Spel		1 st Spell of	f Ins	structions	02-07-2018 to 01-09- 2018
GR15A2055	Mic	rocontroll	ers	PK	PF	P Prashanth 1 st Mid-term Examinatio			m ons		03-09-2018 to 05-09- 2018
GR15A3018	Power Electronics		nics	DKK	D Ka	D Karuna Kumar		2 nd Spell of In		structions	06-09-2018 to 24-10- 2018
GR15A3017	Electrical Measurements and Instrumentation		UVL	U Vijaya Lakshmi		2 nd Mid-term Examinations			25-10-2018 to 27-10- 2018		
GR15A3152	Solar & Wind Energy F Systems		PSVD/Dr JP	P Sri Vidya Devi/Dr J Praveen		Dr J	Preparation			29-10-2018 to 06-11- 2018	
GR15A3019	Sensors and Ins	s/Measure trumentat	asurements entation Lab UVL/PS U Vijaya Lakshmi/ P Sirisha End Semest Examination		End Semester Examinations (Theorv/		r (Theory/	08-11-2018			
GR15A3020	Power	Electronic	cs Lab	SN/MRE	Syed Sar	faraz Naw Rekha	az/ M	Practicals) Suppleme) Re nta	egular / ry	2018
GR15A2059	Microcontrollers Lab		PK/DKK	P Prashanth Kumar Karuna Kumar		ar/ D	Commencement Second Semester		ent of ester, 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





GUIDELINES TO STUDY THE COURSE/SUBJECT

Academic Year	: 2018-2019
Semester	: I
Name of the Program:EEI	E B.Tech Section:A&B
Course/Subject: SOLA	R AND WIND ENERGY CodeGR15D5044
Name of the Faculty:J.	PRAVEEN & P.SRIVIDYADEVI Dept.:EEE
Designation: .PROFESSOR& Guidelines to study the Cours	z ASST.PROFESSOR e/ 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:





COURSE SCHEDULE

Academic Year	: 2018-2019					
Semester	: I					
Name of the Progra	m:EEE B.Tech Section:A&B					
Course/Subject:SOLAF	AND WIND ENERGYCode:GR15D5044					
Name of the Faculty:J. PRAVEEN & PSVD						
Designation: PROFESSOR& ASST.PROFESSOR						

The Schedule for the whole Course / Subject is:

		Total No.
S. No.	Description	Of Periods
	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	
1.	Radiation on Inclined Plane Surface	12
	Solar Thermal Systems: Solar Collectors,	10
2.	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)	
	Solar Photovoltaic Systems: Solar Cell	10
3.	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	
	Wind Energy: Origin of Winds, Nature of	8
4.	Winds, Wind Turbine Siting, Major	
	Applications of Wind Power, Basics of Fluid	
	Mechanics, Wind Turbine Aerodynamics.	
	Wind Energy Conversion Systems: Wind	10
5.	Energy Conversion Systems (WECS). Wind-	10
	Diesel Hybrid System Effects of Wind Speed	
	and Grid Condition (System Integration) Wind	
	Energy Storage Environmental Aspects	
	Energy Storuge, Environmental rispects	

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





SCHEDULE OF INSTRUCTIONS COURSEPLAN

Academic Year

: 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.PeriodsTopics / Sub-TopicsOutcomes Nos.(Text Book, Journal) Page Nos.:to111Solar Energy Basics1&1T1: 118122Radiation Spectrums1&1T1: 11812.2Radiation Spectrums1&1T1: 119 TO 12013.1Terrestrial and of Solar Radiation, Depletion of Solar Radiation, Depletion1T1: 12114.2of Solar Radiation, Depletion of Solar Radiation1&1T1: 122 to 12315.2Radiation Data, Measurement of Solar Radiation1&1T1: 125 to 129162Sufar Cal Apparent Time), Solar Time(Local Apparent Time), Solar Radiation Availability on Horizontal Suface For Cloudy skies, Skies, Solar Radiation on Hourly Global, Diffuse and Beam Radiation on Hourly Global, Diffuse and Beam Radiation on Inclined Plane Surface1&2T1: 130 to 138211Solar Thermal Systems2&2T1: 15322222Heater, Rediation approximation117.2111			No. of		Objectives &	References
No. No. Journal) 1 1. 1 Solar Energy Basics 1&1 T1: 118 1 1. 1 Solar Energy Basics 1&1 T1: 118 1 2. 2 Radiation Spectrums 1&1 T1: 119 TO 120 1 3. 1 Terrestrial and T1: 119 TO 120 1 3. 1 Terrestrial Radiations 1&1 T1: 121 1 3. 1 Terrestrial Radiation, Depletion of Solar Radiation, Depletion of Solar Radiation, Depletion of Solar Radiation, 1&1 T1: 122 to 123 1 4. 2 of Solar Radiation Data, Measurement of Solar 1&1 T1: 125 to 129 1 5. 2 Radiation 1&1 T1: 125 to 129 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 6 2 Surface For Cloudy skies, 1&2 T1: 130 to 138 1 7. 2 Inclined Plane Surface 1&2 T1: 144 2 1 1 Solar Thermal Systems 2&2 </td <td>Unit</td> <td>Lesson</td> <td>Periods</td> <td>Topics / Sub-Topics</td> <td>Outcomes</td> <td>(Text Book,</td>	Unit	Lesson	Periods	Topics / Sub-Topics	Outcomes	(Text Book,
1 1. 1 Solar Energy Basics 1&1. 1 Solar Energy Basics 1&1. 1. 1 The sun as a source of energy, The Earth Sun, Earth The sun as a source of energy, The Earth Sun, Earth Th: 118 T1: 119 TO 120 1 2. 2 Radiation Spectrums 1&1. T1: 119 TO 120 1 3. 1 Terrestrial and Terrestrial and of Solar Radiation, Depletion of Solar Radiation, Depletion of Solar Radiation, Depletion of Solar Radiation Data, Measurement of Solar T1: 122 to 123 1 5. 2 Radiation Data, Measurement of Solar T1: 125 to 129 1 5. 2 Radiation for Estimating Solar Radiation Geometry, Solar Radiation Geometry, Solar Radiation Availability on Horizontal Surface End Cloudy skies, 1&2 T1: 130 to 138 1 6 2 Surface Colcudy skies, 1&2 T1: 130 to 138 1 7. 2 Inclined Plane Surface 1&2 T1: 144 2 1 1 Solar Thermal Systems 2&2 T1: 153 to 170	No.	No.			Nos.	Journal)
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13.1Extra-terrestrial and Terrestrial Radiations1&1T1: 12113.1Spectral Energy Distribution of Solar Radiation, Depletion of Solar Radiation, Depletion1T1: 122 to 12314.2of Solar Radiation, Depletion of Solar Radiation1&1T1: 122 to 12315.2Radiation Data, Measurement of Solar Radiation1&1T1: 125 to 12915.2Radiation1&1T1: 125 to 12915.2Radiation1&1T1: 125 to 12915.2Radiation Radiation Geometry, Solar Day Length, Empirical Equations for Estimating Solar Radiation Availability on Horizontal Beam Radiation on Horizontal Surface For Cloudy skies, Skies, Solar Radiation on Hourly Global, Diffuse and Beam Radiation on Horizontal Surface Under Cloudless Skies, Solar Radiation on Inclined Plane SurfaceT1: 1442112&2T1: 153222Heater, Heater,2&3T1: 153 to 17022221Inclined Planesurface1	1	2.	2	Radiation Spectrums	1&1	T1: 119 TO 120
13.1Terrestrial Radiations1&1T1: 12113.1Spectral Energy Distribution of Solar Radiation, Depletion of Solar Radiation, Depletion1T1: 12114.2of Solar Radiation, Depletion of Solar Radiation Data, Measurement of Solar1&1T1: 122 to 12315.2Radiation Data, Measurement of Solar1&1T1: 125 to 12915.2Radiation adiation1&1T1: 125 to 12915.2Radiation Geometry, Solar Day Length, Empirical Equations for Estimating Solar Radiation Availability on Horizontal Surface For Cloudy skies,1&2T1: 130 to 138162Surface For Cloudy skies, Skies, Solar Radiation on Inclined Plane Surface1&2T1: 1442112&2T1: 153222112&3T1: 153 to 17022222211: 153 to 170				Extra-terrestrial and		
14.2Spectral Energy Distribution of Solar Radiation, Depletion of Solar Radiation, Depletion1&1T1:122 to 12314.2of Solar Radiation, Depletion of Solar Radiation Data, Measurement of Solar1&1T1:122 to 12315.2Radiation1&1T1:125 to 12915.2Radiation1&1T1:125 to 12915.2Radiation1&1T1:125 to 12915.2Radiation1&1T1:125 to 129162Solar Time(Local Apparent Time), Solar Day Length, Empirical Equations for Estimating Solar Radiation Availability on Horizontal Beam Radiation on Horizontal Surface For Cloudy skies,1&2T1: 130 to 138162Surface For Cloudy skies,1&2T1: 130 to 13817.2Inclined Plane Surface1&2T1: 1442112&2T1: 153222Heater,2&3T1: 153 to 1702222Heater,2&3T1: 153 to 170	1	3.	1	Terrestrial Radiations	1&1	T1: 121
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Department of Electrical & Electronics Engineering

COURSE OBJECTIVES

Academic Year	:2018-19			
Semester	: 11			
Name of the	Program: EEE	Year:B.Tech	III 	Section:A/B
Course/Subject:	Switch Gear and Prot	tection Cou	urseCode: GR15	5A3022
Name of the Face	ulty: Dr. J.Praveen,P.Srivid	yadevi	Dept.E	EE:
Designation: PR	OFESSOR ,ASST.PROFE	SSOR		
On completion of	this Subject/Course the studer	nt shall be able to	:	
S.No		Objectives		
Course Objectives:				
1. Graduates will be phenomena to deliv	e able to explain the Principle ver solar energy	s that underlie th	e ability of variou	ıs natural
2. Graduates will be	e able to outline the technolo	gies that are used	d to harness the p	ower of solar energy
3. Discuss the posit the environment	ive and negative aspects of so	blar energy in rela	ation to natural ar	nd human aspects of
4. Graduates will be phenomena to deliv	e able to explain the Principle ver wind energy	s that underlie th	e ability of variou	ıs natural
5. Graduates will be energy	e able to outline the technolo	gies that are used	d to harness the p	ower of Wind
6. Discuss the posit the environment	ive and negative aspects of W	/ind energy in rel	ation to natural a	nd human aspects of

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.





COURSE OUTCOMES

Academic Year	:2018-19			
Semester	: 11			
Name of the Progra	am:EEE Year:B.Tec	h III S	ection: A/B	
Course/Subject: Swite	ch Gear and Protection		CourseCo	de: GR15A3022
Name of the Faculty:	Dr. J.Praveen,P.Srividyad	levi,	Dept.:	EEE
Designation: PROFE	SSOR ,ASST.PROFESS	OR		
The expected outcomes	of the Course/Subject are:			
Course Outcomes 1. Introduction of the ba	sic concepts of Solar and W	ind Energies		
2. Knowledge on the sola	ar power extraction and col	lection		
3. Information and insta	llation of Photo voltaic syste	ems		
4. Information and insta	llation of wind systems			
5. Knowledge of PV Sola	r Panels			
6. Knowledge of wind ge	enerators			
7. Applications of wind a	nd Solar power technologie	es for hybrid power ge	eneration.	

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



Department of Electrical & Electronics Engineering

Cognitive Level Mapping

Cognitive Learning Levels

COs

1 √	2	2	3	4	5	6	
	1				\checkmark		
Ī	2		\checkmark				
	3			\checkmark			
	4						\checkmark
	5				1		
	6				N		
	7						\checkmark

Cognitive Learning Level

- CLL 1: Remembering
- CLL 2: Understanding
- CLL 3: Applying
- CLL 4: Analyzing
- CLL 5: Evaluating
- CLL 6: Creating





ASSIGNMENT SHEET –1

Academic Year	: 2018-2019		
Semester	: I	UNIT NO.1	
Name of the	Program:EEE	B.TechSection	1: A&B
Course/Subject: Name of the Fac P.SRIVIDYADE	SOLAR AND WIND ENERGY. ulty: J. PRAVEEN & EVI	Code: GR15A Dept:EEE	3152

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.:

Outcome Nos.:1.

Signature of HOD

Signature of faculty

Date:





ASSIGNMENT SHEET -2

Academic Year	: 2018-2019				
Semester	: I	UNIT NO.2			
Name of the	Program:EEE	B.TechSection: A&B			
Course/Subject: SOLAR A Name of the Faculty: J. PRA P.SRIVIDYADEVI	AND WIND ENERGY. AVEEN &	Code: GR15A3152 Dept:EEE			
Designation: PROFESSOR	Designation: PROFESSOR& ASST.PROFESSOR.				
Q1.Explain about solar spac	Q1.Explain about solar space-heating and cooling systems?				
Q2.Explain about solar the	rmo mechanical system	ns?			
Q3.Explain about solar cook	kers, solar furnaces and	solar dryer?			
Please write the Questions / students and also mention th Exercises are related.	Problems / Exercises v ne Objectives/Outcome	which you would like to give to the s to which these Questions / Problems /			
Objective Nos.:					

Outcome Nos.: _____2

Signature of HOD

Signature of faculty

Date:





ASSIGNMENT SHEET –3

Academic Year	: 2018-2019		
Semester	: I	UNIT NO.3	
Name of the	Program:EEE	B.TechSection: A&	zВ
Course/Subject: Name of the Fact P.SRIVIDYADE	SOLAR AND WIND ENERGY. ulty: J. PRAVEEN & EVI	Code: GR15A3152 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.

Signature of HOD Signature of faculty

Date:





ASSIGNMENT SHEET -4

Academic Year	: 2018-2019			
Semester	: I	UNIT NO.	4	
Name of the	Program:EEE	B.Tech	Section: A&B	
Course/Subject: SOLA Name of the Faculty: J. I P.SRIVIDYADEVI	R AND WIND ENERGY. PRAVEEN &	Code: Dept:EEE	. GR15A3152	
Designation: PROFESSO	OR& ASST.PROFESSOR			
Q1.List out major applic	ations of wind power?			
Q2.Explain about origin	and nature of winds?			
Please write the Question students and also mentio Exercises are related.	ns / Problems / Exercises w n the Objectives/Outcomes	which you would lik to which these Qu	e to give to the estions / Problems /	
Objective Nos.:	2			
Outcome Nos.:	2			
Signature of HOD faculty			Signature	of

Date:





ASSIGNMENT SHEET –5

Academic Year	: 2018-2019		
Semester	: I	UNIT NO.5	
Name of the	Program:EEE	B.TechSection: A&B	
Course/Subject: S Name of the Facul P.SRIVIDYADEV	SOLAR AND WIND ENERGY. Ity: J. PRAVEEN & /I	Code: GR15A3152 Dept:EEE	
Designation: PRO	FESSOR& ASST.PROFESSOR.		
Q1.Explain wind-o Q2.What are the e	diesel hybrid systems? ffects of wind speed and grid con	ndition?	
Please write the Q students and also r Exercises are relat	uestions / Problems / Exercises w nention the Objectives/Outcomes ed.	vhich you would like to give to the s to which these Questions / Problems /	
Objective Nos.:	3		
Outcome Nos.:	2		
Signature of HOD		Signature	of

Date:

faculty





TUTORIAL SHEET - 1

Academic Year	: 2018-2019	
Semester	: I	UNIT NO.1
Name of the	Program:EEE	B.TechSection: A&B
Course/Subject: SOLAR A Name of the Faculty: J. PRA P.SRIVIDYADEVI	AND WIND ENERGY AVEEN &	CCode: GR15A3152 Dept:EEE
Designation: ASSISTANT	.PROFESSOR& ASS'	Г.PROFESSOR.
This Tutorial corresponds	to01	UnitNo/ Lesson
Q1.Explain about solar radi	ation on inclined plane	e?
Q2.Explain about solar radi	ation data and measur	ement of solar radiation?
Please write the Questions / students and also mention the Exercises are related.	' Problems / Exercises he Objectives/Outcom	which you would like to give to the es to which these Questions / Problems /
Objective Nos.:1		
Outcome Nos.:		
Signature of HOD		Signature of faculty

Date:





TUTORIAL SHEET - 2

Academic Year	: 2018-2019		
Semester	: I	UNIT NO	.2
Name of the	Program:EEE	B.Tech	Section: A&B
Course/Subject: Name of the Facu	SOLAR AND WIND ENERGY. alty: J. PRAVEEN &	Code:	GR15A3152
P.SRIVIDYADE	ZVI	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:





TUTORIAL SHEET - 3

Academic Year	: 2018-2019		
Semester	: I	UNIT NO.3	
Name of the	Program:EEE	B.Tech	Section: A&B
Course/Subject:	SOLAR AND WIND ENERGY.	Code: C	R15A3152
Name of the Facu	ulty: 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:



Department of Electrical & Electronics Engineering

TUTORIAL SHEET - 4

Academic Year	: 2018-2019		
Semester	: I	UNIT NO.4	
Name of the	Program:EEE	B.Tech	.Section: A&B
Course/Subject: Name of the Fact	SOLAR AND WIND ENERGY ulty: J. PRAVEEN &	Code:	GR15A3152
P.SRIVIDYADE	EVÍ	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:



Department of Electrical & Electronics Engineering

TUTORIAL SHEET - 5

Academic Year	: 2018-2019	
Semester	: I	UNIT NO.5
Name of the	Program:EEE	B.TechSection: A&B
Course/Subject: Name of the Fact P.SRIVIDYADE	SOLAR AND WIND ENERGY ulty: J. PRAVEEN & EVI	Code: GR15A3152 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:





EVALUATION STRATEGY

Academic Year	: 2018-2019	
Semester	: I	UNIT NO.5
Name of the	Program:EEE	B.TechSection: A&B
Course/Subject: Name of the Fact P.SRIVIDYADE	SOLAR AND WIND ENERGY ulty: J. PRAVEEN & EVI	Code: GR15A3152 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:











