Lecture Planfor the courses handled related to Renewable Energy Sources

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

LECTURE PLAN

Course Name: **Renewable Energy Sources**	Course Code: **R193202G**
Year/ Sem : **III B TECH II SEM**	Regulation: **R19**

Lecture No.	Topic name	Source
Lecture 1	**Unit-I** Energy conversation principle	T.B: 1- Ch:02 Page No: 27-29
Lecture 2	Energy scenario (world and India)	T.B: 1- Ch:02 Page No: 34-37
Lecture 3	various forms of renewable energy	T.B: 1- Ch:02 Page No: 40-44
Lecture 4	Solar radiation: Outside earth's atmosphere , Earth surface	T.B: 1- Ch:02 Page No: 49-53
Lecture 5	Analysis of solar radiation data	T.B: 1- Ch:2 Page No: 49-53
Lecture 6	Geometry	T.B: 1- Ch:2 Page No: 53-60
Lecture 7	Radiation on tilted surfaces	T.B: 1- Ch:2 Page No: 69-71
Lecture 8	Numerical problems	T.B: 1- Ch:2 Page No: 68-69
Lecture 9	Numerical problems	T.B: 1- Ch:2 Page No: 68-69
Lecture 10	**Unit-II** Solar photovoltaic cell, module, array, construction.	R.B:5-Ch:6 Page no:172-177
Lecture 11	Developing technologies ,Cell I-V characteristics	R.B:5-Ch:6 Page no:166-168
Lecture 12	Equivalent circuit of solar cell	R.B:5-Ch:6 Page no:168-175
Lecture 13	Series resistance , Shunt resistance	R.B:5-Ch:6 Page no:172-175
Lecture 14	Applications and systems	R.B:5-Ch:6 Page no:188-190
Lecture 15	Balance of system components	R.B:5-Ch:6 Page no:185-186
Lecture 16	System design	R.B:5-Ch:6 Page no:176-177
Lecture 17	storage sizing, PV system sizing	R.B:5-Ch:6 Page no:185-187
Lecture 18	Maximum power point techniques: Perturb and observe (P&O) technique	R.B:5-Ch:6 Page no:185-189
Lecture 19	Hill climbing technique	R.B:5-Ch:6 Page no:185-190
Lecture 20	**Unit-III** Sources of wind energy	T.B: 1- Ch:06 Page No:227

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Lecture 21	Wind patterns	T.B: 1- Ch:06 Page No:228-229
Lecture 22	Types of turbines	T.B: 1- Ch:06 Page No:552-553
Lecture 23	Horizontal axis and vertical axis machines	T.B: 1- Ch:06 Page No:257-277
Lecture 24	Kinetic energy of wind	T.B: 1- Ch:06 Page No:231
Lecture 25	Betz coefficient	T.B: 1- Ch:06 Page No:239
Lecture 26	Tip speed ratio	T.B: 1- Ch:06 Page No:269-270
Lecture 27	Efficiency	R.B: 1- Ch:06 Page No:287-289
Lecture 28	Power output of wind turbine	Web process
Lecture 29	Selection of generator(synchronous, induction)	R.B: 1- Ch:06 Page No:293-296
Lecture 30	Maximum power point tracking.	Web process
Lecture 31	wind farms	Web process
Lecture 32	Power generation for utility grids.	Web process
Lecture 33	**Unit-IV** Basic working principle	T.B: 1- Ch:09 Page No:544
Lecture 34	Classification of hydro systems :Large,small,micro	T.B: 1- Ch:09 Page No:546
Lecture 35	Measurement of head and flow	T.B: 1- Ch:09 Page No:546
Lecture 36	Energy equation	Web process
Lecture 37	Types of Turbines	Web process
Lecture 38	Numerical problems.	Web process
Lecture 39	Tidal power- Basics	T.B: 1- Ch:09 Page No:510-513
Lecture 40	Kinetic energy equation	T.B: 1- Ch:09 Page No: 526-527
Lecture 41	Turbines for tidal power	Web process
Lecture 42	Turbines for tidal power	Web process
Lecture 43	Numerical problems	T.B: 1- Ch:09 Page No: 527-529
Lecture 44	Wave power - Basics	T.B: 1- Ch:09 Page No: 533-535
Lecture 45	Kinetic energy equation	T.B: 1- Ch:09 Page No:537
Lecture 46	Wave power devices , Linear generators	Web process
Lecture 47	**Unit-V** Biomass Energy	T.B: 1- Ch:07 Page No:313
Lecture 48	Fuel classification	T.B: 1- Ch:07 Page No:315-324
Lecture 49	Pyrolysis	T.B: 1- Ch:07 Page No:414
Lecture 50	Direct combustion of heat	T.B: 1- Ch:07 Page No:321
Lecture 51	Different digesters and sizing	T.B: 1- Ch:07 Page No:342-353

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Lecture 52	Fixed dome digesters and types	T.B: 1- Ch:07 Page No:353-355
Lecture 53	Fixed dome digesters and types	T.B: 1- Ch:07 Page No:353-355
Lecture 54	Floating drum digesters	T.B: 1- Ch:07 Page No:355-357
Lecture 55	Floating drum digesters	T.B: 1- Ch:07 Page No:355-357
Lecture 56	Fuel cell	T.B: 1- Ch:10 Page No:561
Lecture 57	Classification	T.B: 1- Ch:10 Page No:566
Lecture 58	Efficiency	T.B: 1- Ch:10 Page No:581
Lecture 59	VI characteristics	T.B: 1- Ch:10 Page No:575
Lecture 60	Geothermal	T.B: 1- Ch:08 Page No:439
Lecture 61	Classification	T.B: 1- Ch:10 Page No:443-456
Lecture 62	Dry rock and acquifer	T.B: 1- Ch:10 Page No:463-464
Lecture 63	Energy analysis	Web process

Text Book:

1.Non Conventional Energy Sources by G.D.Rai

2. Solar Energy**:** Principles of Thermal Collection and Storage, S. P.Sukhatme and J. K. Nayak, TMH, New Delhi, 3rd Edition.

3. Renewable Energy Resources, John Twidell and Tony Weir, Taylorand Francis -second edition, 2013.

4. Energy Science**:** Principles, Technologies and Impacts, JohnAndrews and Nick Jelly, Oxford.

Reference Books:

1. Renewable Energy- Edited by Godfrey Boyle-oxford University,press, 3rd edition, 2013.

2. Handbook of renewable technology Ahmed and Zobaa, Ramesh CBansal, World scientific, Singapore.

3. Renewable Energy Technologies /Ramesh & Kumar /Narosa.

4. Renewable energy technologies – A practical guide for beginners –Chetong Singh Solanki, PHI.

5. Non conventional energy source –B.H. Khan- TMH-2nd edition.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

LECTURE PLAN

Course Name: **Renewable Energy Sources**	Course Code: **R1631022**
Year/ Sem : **III B TECH I SEM**	Regulation: **R16**

Lecture No.	Topic name	Source
Lecture 1	**Unit-1** Energy conversation principle	T.B: 1- Ch:02 Page No: 25-29
Lecture 2	Energy scenario (world and India)	T.B: 1- Ch:02 Page No: 30-32
Lecture 3	various forms of renewable energy	T.B: 1- Ch:02 Page No: 35-40
Lecture 4	Solar radiation: Outside earth's atmosphere , Earth surface	T.B: 1- Ch:02 Page No: 49-53
Lecture 5	Analysis of solar radiation data	T.B: 1- Ch:2 Page No: 49-53
Lecture 6	Geometry	T.B: 1- Ch:2 Page No: 53-60
Lecture 7	Radiation on tilted surfaces	T.B: 1- Ch:2 Page No: 69-71
Lecture 8	Numerical problems	T.B: 1- Ch:2 Page No: 68-69
Lecture 9	Numerical problems	T.B: 1- Ch:2 Page No: 68-69
Lecture 10	**Unit-II** Liquid flat plate collections	T.B: 1- Ch:02Page No:(76-79)
Lecture 11	Performance analysis	T.B: 2- Ch:03 Page No:(109-111)
Lecture 12	Transmissivity	T.B: 1- Ch:03 Page No:90
Lecture 13	Absorptivity product collector efficiency **factor**	T.B: 1- Ch:03 Page No:90-91
Lecture 14	Collector heat removal factor	T.B: 2- Ch:03 Page No:91-94
Lecture 15	Numerical problems	T.B: 1- Ch:03 Page No:100-102
Lecture 16	Introduction to solar air heaters	R.B: 1- Ch:03 Page No:81-86
Lecture 17	Concentrating collectors	R.B: 1- Ch:03 Page No:109-138
Lecture 18	Solar pond and solar still	R.B: 1- Ch:03 Page No:138
Lecture 19	Solar thermal plants.	Internet
Lecture 20	**Unit-III** Solar photovoltaic cell, module, array, construction.	R.B:5-Ch:6 Page no:172-177
Lecture 21	Developing technologies ,Cell I-V characteristics	R.B:5-Ch:6 Page no:166-168

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Lecture 22	Equivalent circuit of solar cell	R.B:5-Ch:6 Page no:168-175
Lecture 23	Series resistance , Shunt resistance	R.B:5-Ch:6 Page no:172-175
Lecture 24	Applications and systems	R.B:5-Ch:6 Page no:188-190
Lecture 25	Balance of system components	R.B:5-Ch:6 Page no:185-186
Lecture 26	System design	R.B:5-Ch:6 Page no:176-177
Lecture 27	Storage sizing, PV system sizing	T.B: 1- Ch:06 Page No:200
Lecture 28	Maximum power point techniques: Perturb and observe (P&O) technique	T.B: 1- Ch:06 Page No:218
Lecture 29	Hill climbing technique	T.B: 1- Ch:06 Page No:220
Lecture 30	**Unit-IV** Sources of wind energy	T.B: 1- Ch:06 Page No:227
Lecture 31	Wind patterns	T.B: 1- Ch:06 Page No:228-229
Lecture 32	Types of turbines	T.B: 1- Ch:06 Page No:552-553
Lecture 33	Horizontal axis and vertical axis machines	T.B: 1- Ch:06 Page No:257-277
Lecture 34	Kinetic energy of wind	T.B: 1- Ch:06 Page No:231
Lecture 35	Betz coefficient	T.B: 1- Ch:06 Page No:239
Lecture 36	Tip speed ratio	T.B: 1- Ch:06 Page No:269-270
Lecture 37	Efficiency	R.B: 1- Ch:06 Page No:287-289
Lecture 38	Power output of wind turbine	Web process
Lecture 39	Selection of generator(synchronous, induction)	R.B: 1- Ch:06 Page No:293-296
Lecture 40	Maximum power point tracking.	Web process
Lecture 41	Wind farms	Web process
Lecture 42	Power generation for utility grids.	Web process
Lecture 43	**Unit-V** Basic working principle	T.B: 1- Ch:09 Page No:544
Lecture 44	Classification of hydro systems :Large,small,micro	T.B: 1- Ch:09 Page No:546
Lecture 45	Hydro Power Plant	Internet
Lecture 46	Measurement of head and flow	T.B: 1- Ch:09 Page No:546
Lecture 47	Energy equation	Web process
Lecture 48	Types of Turbines	Web process
Lecture 49	Numerical problems.	Web process
Lecture 50	Tidal power- Basics	T.B: 1- Ch:09 Page No:510-513
Lecture 51	Kinetic energy equation	T.B: 1- Ch:09 Page No: 526-527

Lecture 52	Turbines for tidal power	Web process
Lecture 53	Turbines for tidal power	Web process
Lecture 54	Numerical problems	T.B: 1- Ch:09 Page No: 527-529
Lecture 55	Wave power - Basics	T.B: 1- Ch:09 Page No: 533-535
Lecture 56	Kinetic energy equation	T.B: 1- Ch:09 Page No:537
Lecture 57	Wave power devices , Linear generators	Web process
Lecture 58	**Unit-VI** Biomass Energy	T.B: 1- Ch:07 Page No:313
Lecture 59	Fuel classification	T.B: 1- Ch:07 Page No:315-324
Lecture 60	Pyrolysis	T.B: 1- Ch:07 Page No:414
Lecture 61	Direct combustion of heat	T.B: 1- Ch:07 Page No:321
Lecture 62	Different digesters and sizing	T.B: 1- Ch:07 Page No:342-353
Lecture 63	Fixed dome digesters and types	T.B: 1- Ch:07 Page No:353-355
Lecture 64	Fixed dome digesters and types	T.B: 1- Ch:07 Page No:353-355
Lecture 65	Floating drum digesters	T.B: 1- Ch:07 Page No:355-357
Lecture 66	Floating drum digesters	T.B: 1- Ch:07 Page No:355-357
Lecture 67	Fuel cell	T.B: 1- Ch:10 Page No:561
Lecture 68	Classification	T.B: 1- Ch:10 Page No:566
Lecture 69	Efficiency	T.B: 1- Ch:10 Page No:581
Lecture 70	VI characteristics	T.B: 1- Ch:10 Page No:575
Lecture 71	Geothermal	T.B: 1- Ch:08 Page No:439
Lecture 72	Classification	T.B: 1- Ch:10 Page No:443-456
Lecture 73	Dry rock and acquifer	T.B: 1- Ch:10 Page No:463-464
Lecture 74	Energy analysis	Web process

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

LECTURE PLAN

Course Name: **Renewable Energy Sources & Systems**	Course Code: **RT41021**
Year/ Sem : **IV B TECH I SEM**	Regulation: **R13**

Lecture No.	Topic name	Source
Lecture 1	**Unit-I** Energy conversation principle	T.B: 1- Ch:02 Page No: 30-35
Lecture 2	Energy scenario (world and India)	T.B: 1- Ch:02 Page No: 35-38
Lecture 3	various forms of renewable energy	T.B: 1- Ch:07 Page No:313
Lecture 4	Solar radiation: Outside earth's atmosphere , Earth surface	T.B: 1- Ch:02 Page No: 49-53
Lecture 5	Analysis of solar radiation data	T.B: 1- Ch:2 Page No: 49-53
Lecture 6	Geometry	T.B: 1- Ch:2 Page No: 53-60
Lecture 7	Radiation on tilted surfaces	T.B: 1- Ch:2 Page No: 69-71
Lecture 8	Numerical problems	T.B: 1- Ch:2 Page No: 68-69
Lecture 9	Numerical problems	T.B: 1- Ch:2 Page No: 68-69
Lecture 10	**Unit-II** Liquid flat plate collections	T.B: 1- Ch:02Page No:(76-79)
Lecture 11	Performance analysis	T.B: 2- Ch:03 Page No:(109-111)
Lecture 12	Transmissivity	T.B: 1- Ch:03 Page No:90
Lecture 13	Absorptivity product collector efficiency **factor**	T.B: 1- Ch:03 Page No:90-91
Lecture 14	Collector heat removal factor	T.B: 2- Ch:03 Page No:91-94
Lecture 15	Numerical problems	T.B: 1- Ch:03 Page No:100-102
Lecture 16	Introduction to solar air heaters	R.B: 1- Ch:03 Page No:81-86
Lecture 17	Concentrating collectors	R.B: 1- Ch:03 Page No:109-138
Lecture 18	Solar pond and solar still	R.B: 1- Ch:03 Page No:138
Lecture 19	Solar thermal plants.	R.B: 1- Ch:03 Page No:140
Lecture 20	**Unit-III** Solar photovoltaic cell, module, array, construction.	R.B:5-Ch:6 Page no:172-177

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Lecture 21	Developing technologies ,Cell I-V characteristics	R.B:5-Ch:6 Page no:166-168
Lecture 22	Equivalent circuit of solar cell	R.B:5-Ch:6 Page no:168-175
Lecture 23	Series resistance , Shunt resistance	R.B:5-Ch:6 Page no:172-175
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Lecture 25	Balance of system components	R.B:5-Ch:6 Page no:185-186
Lecture 26	System design	R.B:5-Ch:6 Page no:176-177
Lecture 27	storage sizing, PV system sizing	R.B:5-Ch:6 Page no:176-179
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Lecture 29	Hill climbing technique	T.B: 1- Ch:07 Page No:301
Lecture 30	**Unit-IV** Sources of wind energy	T.B: 1- Ch:06 Page No:227
Lecture 31	Wind patterns	T.B: 1- Ch:06 Page No:228-229
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Lecture 38	Power output of wind turbine	Web process
Lecture 39	Selection of generator(synchronous, induction)	R.B: 1- Ch:06 Page No:293-296
Lecture 40	Maximum power point tracking.	Web process
Lecture 41	wind farms	Web process
Lecture 42	Power generation for utility grids.	Workshop
Lecture 43	**Unit-V** Basic working principle	T.B: 1- Ch:09 Page No:544
Lecture 44	Classification of hydro systems :Large,small,micro	T.B: 1- Ch:09 Page No:546
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Lecture 46	Energy equation	Web process
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Lecture 48	Numerical problems.	Web process
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Lecture 50	Kinetic energy equation	T.B: 1- Ch:09

		Page No: 526-527
Lecture 51	Turbines for tidal power	Web process
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Lecture 69	Geothermal	T.B: 1- Ch:08 Page No:439
Lecture 70	Classification	T.B: 1- Ch:10 Page No:443-456
Lecture 71	Dry rock and acquifer	T.B: 1- Ch:10 Page No:463-464

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