

Lecture Plan-1

Semester:-VII Class:- Mech. Engg. Course Code:- ME-407-F

Subject:- Power Plant Engg. Unit:- ----1---

S. No.	Topic :- Introduction to syllabus.	Time Allotted:-
1.	Introduction A brief discussion about Power Plant Engineering syllabus	05 min.
2	Division of the Topic Introduction to myself, and to the students, Teaching Methodology of Dronacharya College of Engineering, Need of the particular Power Plant Engineering subject, Syllabus contents.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Need of the particular Power Plant Engineering subject?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- 3) Gas turbines By R. Yadav

Lecture Plan-2

Semester:-VII Class:-Mech. Engg. Course Code:-ME-407-F

Subject:-Power Plant Engg. Unit:- I

S. No.	Topic :- Energy resources and their availability	Time Allotted:-
1.	Introduction About power, Power generation units, Types.	05 min.
2	Division of the Topic Energy resources and their availability, Types of power plants, Strategy for meeting future energy requirements, Selection of the power plants.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Types of power plant ? Strategy for meeting future energy requirements ?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- 3) Gas turbines By R. Yadav

Lecture Plan-3

Semester:-VII Class:-Mech. Engg. Course Code:-ME-407-F

Subject:-Power Plant Engg. Unit:- I

S. No.	Topic :- Energy resources and their availability	Time Allotted:-
1.	Introduction About processes, Power plants based upon cycles.	05 min.
2	Division of the Topic Review of basic thermodynamics cycles using in power plants, Rankine cycle, Reheat cycle, Regenerative cycle.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Rankine cycle, reheat cycle, regenerative cycle ?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- 3) Gas turbines By R. Yadav

Lecture Plan-4

Semester:-VII Class:-Mech. Engg. Course Code:-ME-407-F

Subject:-Power Plant Engg. Unit:- I

S. No.	Topic :- Energy resources and their availability	Time Allotted:-
1.	Introduction Using combined cycles, Repowering, PFBC.	05 min.
2	Division of the Topic Combined cycles, Arrangement of combined cycles, Repowering systems, With gas production from coal, Using PFBC systems, With organic fluids.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Repowering Systems? PFBC Systems?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- 3) Gas turbines By R. Yadav

Lecture Plan-5Semester:-VIIClass:-Mech. Engg.Course Code:-ME-407-FSubject:-Power Plant Engg.Unit:- I

S. No.	Topic :- Energy resources and their availability	Time Allotted:-
1.	Introduction Power plants in India, Future requirements.	05 min.
2	Division of the Topic Parameter affecting thermodynamic efficiency of Combined cycles, Scenario of power plants in India, Problems encountered with power plants.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Scenario of power plants in India ?	05 min.

Assignment to be given:-

- 1) Explain PFBC system.
- 2) Explain Coupling of steam turbine cycle with organic fluid.

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- 3) Gas turbines By R. Yadav

Lecture Plan-6

Semester:-VII Class:-Mech. Engg. Course Code:-ME-407-F

Subject:-Power Plant Engg. Unit:- II

S. No.	Topic :- Hydroelectric power plants	Time Allotted:-
1.	Introduction About Hydroelectric power plants, Basic requirements.	05 min.
2	Division of the Topic Hydroelectric power plants, Hydrology, rainfall, Run-off , Hydrograph, Flow duration curve.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Hydrology, rainfall, run-off , hydrograph ?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- 3) Gas turbines By R. Yadav

Lecture Plan-7

Semester:-VII Class:-Mech. Engg. Course Code:-ME-407-F

Subject:-Power Plant Engg. Unit:- II

S. No.	Topic :- Hydroelectric power plants	Time Allotted:-
1.	Introduction Data calculations, Flow charts, Measuring instruments.	05 min.
2	Division of the Topic Mass curve, Determination of storage capacity, Problems based on hydroelectric power plants, General features.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Mass curve, determination of storage capacity?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
is turbines By R. Yadav

Lecture Plan-8

Semester:-VII Class:-Mech. Engg. Course Code:-ME-407-F

Subject:-Power Plant Engg. Unit:- II

S. No.	Topic :- Hydroelectric power plants	Time Allotted:-
1.	Introduction Classification based upon water head.	05 min.
2	Division of the Topic Low, medium, High head plants, Base load plants, And peak load plants, Micro-hydel plants, Site selection.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Low, medium, high head plants, base load plants, And peak load plants?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
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Lecture Plan-9

Semester:-VII Class:-Mech. Engg. Course Code:-ME-407-F

S. No.	Topic :- Hydroelectric power plants	Time Allotted:-
1.	Introduction Classification based upon availability of water in quantity.	05 min.
2	Division of the Topic Layout , Classification, Run-off river plants, Pump storage plants.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Classification, run-off river plants, pump storage plants?	05 min.

Assignment to be given:-

- 1) Classify the Hydro Electric Power Plants.
- 2) A comparatively study on Hydrology.

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
is turbines By R. Yadav

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Lecture Plan-10

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

S. No.	Topic :- Thermal power plants	Time Allotted:-
1.	Introduction Discussion about Thermal power plants/ Steam power plants.	05 min.
2	Division of the Topic Steam power plants, Flow sheets, Working of modern thermal power plants.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Working of modern thermal power plants?.	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- 3) Gas turbines By R. Yadav

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Lecture Plan-11

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- III

S. No.	Topic :- Thermal power plants	Time Allotted:-
1.	Introduction Availability of coal, Handling, Future requirements	05 min.
2	Division of the Topic Super critical pressure Steam stations, Site selection. Coal storage and coal preparation, Coal handling systems, Feeding and burning of pulverized fuel, burners.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Super critical pressure, steam stations, site selection.?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
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Lecture Plan-12

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- III

S. No.	Topic :- Thermal power plants	Time Allotted:-
1.	Introduction About Ash Handling, Dust collectors.	05 min.
2	Division of the Topic Ash handling system, Dust collection, Mechanical dust collectors, Electrostatic precipitators.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Mechanical dust collectors, electrostatic precipitators.?	05 min.

Assignment to be given:-

- 1) Explain ash handling systems.
- 2) Explain coal handling systems.
- 3) Explain about dust collectors.

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- Gas turbines By R. Yadav

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Lecture Plan-13

Semester:-VII Class:-Mech. Engg. Course Code:-ME-407-F

Subject:-Power Plant Engg. Unit:- IV

S. No.	Topic :- Gas turbine power plants	Time Allotted:-
1.	Introduction Basics of gas turbines/ cycle. About compressors.	05 min.
2	Division of the Topic Gas turbine power plants, Types, open and closed cycle, Work output, Optimum pressure ratio, Thermal efficiency.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Types, open and closed cycle?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
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Lecture Plan-14

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- IV

S. No.	Topic :- Gas turbine power plants	Time Allotted:-
1.	Introduction Needs to improve the thermal efficiency of gas turbine power plants.	05 min.
2	Division of the Topic Methods to improve the thermal efficiency of gas turbine power plants, Reheating, Inter-cooling.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Reheating, Inter-cooling?.	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
Gas turbines By R. Yadav

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Lecture Plan-15

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- IV

S. No.	Topic :- Gas turbine power plants	Time Allotted:-
1.	Introduction Needs to improve the thermal efficiency of gas turbine power plants	05 min.
2	Division of the Topic Regeneration and Problems encountered with gas turbine cycle with improved efficiency.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Regeneration?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
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Lecture Plan-16

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- IV

S. No.	Topic :- Gas turbine power plants	Time Allotted:-
1.	Introduction Friction losses gas turbines and compressors are taken into considerations.	05 min.
2	Division of the Topic Expression for the cycle efficiency of gas turbine, If compressors and turbines efficiencies are considered.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer If compressors and turbines efficiencies are considered?	05 min.

Assignment to be given:-

- 1) Derive the expression for optimum pressure ratio.
- 2) Effect of reheating, Inter-cooling, Regeneration on thermal efficiency.
- 3) Gas turbine power plants- a study.

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
is turbines By R. Yadav

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Lecture Plan-17

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:-V

S. No.	Topic :- Nuclear power plants	Time Allotted:-
1.	Introduction About nuclear power, Power generation, Contribution.	05 min.
2	Division of the Topic Nuclear power plants, Introduction to main components of Nuclear power plants, Sketches	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Main components of Nuclear power plants?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
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Lecture Plan-18

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- I

S. No.	Topic :- Nuclear power plants	Time Allotted:-
1.	Introduction Classification of reactors.	05 min.
2	Division of the Topic Pressurized water reactors(PWR), Boiling water reactors (BWR), And their advantages & Dis-advantages.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Advantages & Dis-advantages of PWR, BWR?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- 3) Gas turbines By R. Yadav

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Lecture Plan-19

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:-V

S. No.	Topic :- Nuclear power plants	Time Allotted:-
1.	Introduction Classification of reactors.	05 min.
2	Division of the Topic Canadian deuterium Uranium Reactor (CANDU), Gas cooled reactor, sodium graphite reactor, And their advantages & Dis-advantages	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Canadian deuterium Uranium Reactor (CANDU)?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
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Lecture Plan-20

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- I

S. No.	Topic :- Nuclear power plants	Time Allotted:-
1.	Introduction Limitations, Radio active waste disposal, Safety features.	05 min.
2	Division of the Topic Fast breeder reactor, Homogeneous reactor, limitations, Site selection, Radio active waste disposal, Safety features, Fusion power and its limitations.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Fast breeder reactor, homogeneous reactor, limitations, site selection?	05 min.

Assignment to be given:-

- 1) Classification of nuclear power plants.
- 2) Safety features.
- 3) Radio active waste disposal.

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- Gas turbines By R. Yadav

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Lecture Plan-21

Semester:-VII Class:-Mech. Engg. Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:-VI

S. No.	Topic :- Cost estimations, Load estimations.	Time Allotted:-
1.	Introduction Brief details about Cost estimations, Load estimations, Load calculations steps.	05 min.
2	Division of the Topic Cost estimations, And load estimations, Load curve, Connected load, Max. Demand, Load factor, average load.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Load curve, connected load?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- is turbines By R. Yadav

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Lecture Plan-22

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- VI

S. No.	Topic :- Cost estimations, Load estimations.	Time Allotted:-
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1.	Introduction Problems encountered with load curve, Connected load, max. Demand, load factor, average load.	05 min.
2	Division of the Topic Load curve, Load duration curve, Problems based on load curve, Connected load, max. Demand, load factor, average load.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Load curve, load duration curve?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- 3) Gas turbines By R. Yadav

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Lecture Plan-23

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- I

S. No.	Topic :- Cost estimations, Load estimations.	Time Allotted:-
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1.	<p>Introduction</p> <p>Brief introduction about Plant use factor, Load factor, Plant capacity factor, Diversity factor.</p>	05 min.
2	<p>Division of the Topic</p> <p>Plant use factor, Load factor, Plant capacity factor, Diversity factor.</p>	35 min.
3.	<p>Conclusion</p> <p>Above topics will be discussed.</p>	05 min.
4	<p>Question / Answer</p> <p>Plant capacity factor, diversity factor?</p>	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
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Lecture Plan-24

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:-VII

S. No.	Topic :- Cost of electrical energy	Time Allotted:-
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1.	Introduction Problems encountered with Cost of electrical energy, And utilization factor.	05 min.
2	Division of the Topic. Cost of electrical energy, Utilization factor, Problems encountered with Cost of electrical energy, And utilization factor.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Cost of electrical energy, utilization factor?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
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Lecture Plan-25

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:-VII

S. No.	Topic :- Cost of electrical energy	Time Allotted:-
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1.	Introduction Brief introduction about Tariff methods of electrical energy performance	05 min.
2	Division of the Topic Tariff methods of electrical energy performance, And operating characteristics of power plants.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer Tariff methods of electrical energy performance?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
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Lecture Plan-26

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- VII

S. No.	Topic :- Cost of electrical energy	Time Allotted:-
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1.	<p>Introduction</p> <p>Brief discussion about Non- conventional Energy resources and their method of conversions.</p>	05 min.
2	<p>Division of the Topic</p> <p>Non- conventional power generation, Solar power plants, Solar energy, solar energy collectors, Low, medium, high temperatures power plants.</p>	35 min.
3.	<p>Conclusion</p> <p>Above topics will be discussed.</p>	05 min.
4	<p>Question / Answer</p> <p>Solar power plants?</p>	05 min.

Assignment to be given:-

Reference Readings:-

Doc. No.: DCE/0/15

Revision :00

1) Power Plant Engg. By G. D. Ray
Power Plant Engg. By Arora & Domkundwar
Gas turbines By R. Yadav

Lecture Plan-28

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- VIII

S. No.	Topic :- Non- conventional Energy resources	Time Allotted:-
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1.	Introduction Brief discussion about Non- conventional Energy resources and their method of conversions.	05 min.
2	Division of the Topic Wind energy, Wind mills, wind power stations, OTEC energy, OTEC power plants.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer OTEC energy, OTEC power plants?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- 3) Gas turbines By R. Yadav

Doc. No.: DCE/0/15

Revision :00

Lecture Plan-29

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- VIII

S. No.	Topic :- Non- conventional Energy resources	Time Allotted:-
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1.	Introduction Brief discussion about MHD- fuel cells, And electro-chemical cells	05 min.
2	Division of the Topic MHD- fuel cells, Electro-chemical cells, Cost estimations, wind power, Wave energy, geo-thermal energy, Geo-thermal power plants.	35 min.
3.	Conclusion Above topics will be discussed.	05 min.
4	Question / Answer MHD- fuel cells, electro-chemical cells?	05 min.

Assignment to be given:-

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
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Doc. No.: DCE/0/15

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Lecture Plan-30

Semester:-VII

Class:-Mech. Engg.

Course Code:-ME-407-F

Subject:-Power Plant Engg.

Unit:- VIII

S. No.	Topic :- Non- conventional Energy resources	Time Allotted:-
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1.	<p>Introduction</p> <p>Brief discussion about applications of Renewable energy resources.</p>	05 min.
2	<p>Division of the Topic</p> <p>Renewable energy resources: Applications of fuel cells, Electro-chemical cells.</p>	35 min.
3.	<p>Conclusion</p> <p>Above topics will be discussed.</p>	05 min.
4	<p>Question / Answer</p> <p>Renewable energy resources ? Applications of fuel cells, electro-chemical cells ?</p>	05 min.

Assignment to be given:-

- 1) Explain solar energy, solar energy collectors, temperatures power plants.
- 2) Explain wind power stations, OTEC energy, OTEC power plants.
- 3) Explain Applications of fuel cells, electro-chemical cells.

Reference Readings:-

- 1) Power Plant Engg. By G. D. Ray
- 2) Power Plant Engg. By Arora & Domkundwar
- 3) Gas turbines By R. Yadav