



Regn Tm: 2607298

**LESSON PLAN REGISTER**  
DEPARTMENT OF MECHANICAL ENGG.  
BDSE, BRAJRAJNAGAR  
SEMESTER: 3<sup>RD</sup> SEMESTER/4<sup>TH</sup> SEMESTER  
SESSION-2018-19  
NAME OF FACULTY: MTC. B. MISHRA.

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LONG BOUND EXERCISE BOOK

Concluded that this Lesson plan  
Register Contains 93 pages.



ER. AMIRKA  
PRINCIPAL  
BLACK DIAMOND SCHOOL OF ENGINEERING  
JHARSUGUDA

Discipline	Mech.	Semester	3rd.	Name of the teaching Faculty	Byomkesh Mishra.
Subject	Thermal Engineering - I	No. of Days/week	⑤	Semester From Date to date.	NO. of Weeks - 18
Week	class/day	Class allotted			
	1st	Introduction to Thermodynamics			
	2nd	Thermodynamic Systems, statements and explanations.			
1st	3rd				
	4th	Concept of Macroscopic and microscopic - - - -			
	5th	Thermodynamic properties, Intensive and extensive - - -			
	6th	Thermodynamic state and process. Define Pressure, volume, temp. with units.			
	1st	Thermodynamic Equilibrium.			
	2nd	Quasistatic Process			
2nd.	3rd	x			
	4th	Concept of Energy, Work, Pressure, Abs. temperature			
	5th	Continue - - - -			
	6th	Work and Work transfer			
	1st	Heat transfer, different modes of heat transfer.			
3rd	2nd	concepts of conduction, convection, and radiation			
	3rd	-			
	4th	sensible heat, Latent heat.			
	5th	specific heat and difference bet <sup>n</sup> . heat and work			
	6th	Energy and its sources.			
	1st	Renewable and non-renewable energy sources.			
4th	2nd	Laws of thermodynamics and zeroth law.			
	4th	First law of thermodynamics			
	5th	Energy as system property, forms of energy			

	5th	Simple problems.
	6th	cont - - - -

14th	1st	Define gas. Difference between gas and vapour.
	2nd	Boyle's Law, Charles's Law, Gay-Lussac law.
	3rd	X
	4th	Combine gas law, its derivation.
	5th	Equation of state, characteristic gas constant for ideal gases.
	6th	Universal gas constant and their values.

15th	1st	Mechanical work transfer. Work transfer for ideal gases:
	2nd	Const. vol., const. Pressure, constant <del>the</del> temperature process
	3rd	X
	4th	Isothermal process, work done, relation between P, V, T
	5th	Adiabatic process, relation between P, V and T
	6th	cont - - , W, dh, du - -

16th	1st	Polytropic process. W, dh, du, Q
	2nd	Vander wall equation of state for real gases.
	3rd	X
	4th	Difference between ideal gas and real gas
	5th	Simple problems
	6th	Continue - - -

17th	1st	Problems work out - - -
	2nd	
	3rd	X
	4th	
	5th	
	6th	

6th	1st	Stored energy, conservation of energy.
2nd	1st	First law for a closed system
3rd	2nd	continue - - cyclic process
5th	3rd	x
4th	1st	First law for a closed system - - change of state
5th	4th	Enthalpy, Internal energy concepts.
6th	5th	Mathematical equation . . . . .
6th	6th	Application of First law cont. . . . .
1st	1st	First process and non-flow process.
2nd	2nd	First law applied to steady flow process.
3rd	3rd	x
4th	6th	Steady flow energy equation. cont. . . . .
5th	4th	Its application to nozzle, turbine, compressor.
6th	5th	Solution to simple problems.
1st	1st	Perpetual motion machine of 1st kind
2nd	2nd	Problems on Abs pressure, gauge pressure, Atm. pressure.
3rd	3rd	x
4th	4th	Limitations of First Law.
5th	5th	Definition of 2nd law of thermodynamics . . . . .
6th	6th	Thermal reservoirs, (Source, Sink)
1st	1st	Kelvin-Planck statement and Clausius statement.
2nd	2nd	Concept of heat engine, heat pump and refrigerator.
3rd	3rd	Efficiency, COP.
4th	4th	Problems on both . . . . .
5th	5th	Perpetual motion machine of 2nd kind
6th	6th	Application of second law in heat engine, . . . . .

1st	1st	Application of 2nd Law to heat pump and refrigerator.
2nd	2nd	Determination of efficiency and COP . . . . .
3rd	3rd	Simple mathematical problems.
4th	4th	Cont. . . . .
5th	5th	Enthalpy. definition, units, mathematical formula.
6th	6th	Enthalpy. definition, units, mathematical formula.
1st	1st	Disorder of entropy for reversible and irreversible.
2nd	2nd	Clausius inequality,
3rd	3rd	Principle of increase in entropy.
4th	4th	Entropy changes at const. T, P and V.
5th	5th	Mathematical relations.
6th	6th	Simple Problems.
1st	1st	Working substances, ex: Steam.
2nd	2nd	What is pure substance.
3rd	3rd	x
4th	4th	Steam formation, Difference between steam/gas.
5th	5th	Phase change diagram on T-H plot.
6th	6th	P-V, P-H and T-S diagrams.
1st	1st	Sensible heat, Latent heat of vaporisation.
2nd	2nd	Latent heat of fusion, specific heats
3rd	3rd	x
4th	4th	Wet steam, dry saturated steam and superheated
5th	5th	steam. cont. . . . .
6th	6th	Dryness fraction.
1st	1st	Study and uses of steam table, Mollier diagram.
2nd	2nd	cont. . . . .
3rd	3rd	Mathematical formulae for enthalpy,
4th	4th	specific volume, specific entropy . . . . .

4th SEMESTER

PHYSICS	Mech. Semester - 3rd	Name of the teaching Faculty	Bhaskar Mishra
S.D.B.T	No. of Days/Week	Semester From Date to Date.	No. of Weeks - 14 Weeks
C	Machine allotted	07-01-2019 to 16-4-2019	

1st week

- Introduction to TOM, Simple mechanisms
- Link, Kinematic chain, mechanism
- Inversion, Four bar mechanism.
- Lower pair mechanism.

2nd week

- Higher pair mechanism
- Cam and followers
- Introduction to friction, Types of friction, Laws of friction, angle of repose, Include screw
- Screw gear, simple problems
- Work out.

3rd week

- Bearings, classification, Flat pivot, conical and collar bearings.
- Mathematical Problems with derivation
- Ball bearing, roller bearing
- Introduction to clutches
- Working of Single plate clutch.
- Torque transmission derivation

4th week

- Simple problems work out on angle and multiple clutches.
- Brakes, types of Brakes, function dynamometer, function of dynamometer, Absorption and energy brake dynamometer.

5th week

- Power transmission
- Types of drives, Belt drive, gear drive
- Chain drive.
- Types of belts, belt materials,
- Types of belt drives, Flat belt V-belt
- Length of belt (open and crossed) derivation
- Creeping, slip, creep.

6th week

- Rate of tensions ( $T_1/T_2 = e^{\mu \theta}$ )
- Centrifugal tension, Initial tension
- Power transmission by belt.
- Derivation and mathematical problems work out.

7th week

- V-belts and pulleys.
- Gear drives, types of gears.
- Gear terminology
- Gear trains Simple, Compound

- Reverted and epicyclic gear trains.
- Simple problems

8th week

- Introduction to governors.
- Classification of governors.
- Watt governor.

- Working of Watt governor.

- Porter governor.

9th week

- Hartnell governor, construction and working.
- Height of governors

- Sensitivity, stability and isochronism.

- Simple problems work out -

10th week

- Introduction of flywheel.
- Working of flywheel.

- Function of flywheel, Turning moment diagram.

- Comparison between flywheel and governor.

- Fluctuation of energy, speed.

- Coefficient of energy and speed.

11th week

- Simple problems.

- Balancing. Static balancing.

- Dynamic balancing.

12th week

- Principle of balancing of reciprocating parts.
- Causes and effects and remedies of unbalancing.
- Difference between static and dynamic balancing.
- Simple problems.

13th week

- Introduction to vibration
- Amplitude, time period, frequency
- Causes of vibration
- Classification of vibration.
- Concept of free vibration, forced vibration.

14th week

- Damped vibration.
- Transient and longitudinal vibration
- Causes of vibration
- Effect of vibration and remedies of vibration.

Describe	Name of	No. of	No. of weeks -
Mechanical	the teaching - Bismakesh Mishra	Semester - 3rd	Faculty
Thermal engin	from date to	days/week	15-7-2019
eng-1	classified date		09-11-2019
Week		(4)	(17)
class/day			

1st Introduction to thermodynamics.  
 2nd Thermodynamic systems.  
 closed, open and Isolated system

3rd  
 4th  
 5-14 conf. -  
 6th Thermodynamic properties.

1st Intensive and extensive properties  
 2nd Internal energy, pressure, volume -  
 3rd Temperature, units -

4th  
 5th Thermodynamic Processes, Path -  
 6th Thermodynamic cycle, state function  
 Path function, Point function

1st Thermal equilibrium, mechanism of  
 2nd equilibrium, Chemical equilibrium,  
 3rd Thermodynamic equilibrium.

4th  
 5th Quasistatic process.  
 6th Work, Heat and Comparing

1st Work done in closed and opened system.  
 2nd Work transfer, Displacement work

3rd  
 4th  
 5th Laws of thermodynamics, Zeroth law.  
 6th Concept of First law of thermody-  
 namics.

1st Limitations of First Law.  
 2nd PMM-1 and PMM-2.

3rd  
 4th  
 5th Application of First Law.  
 6th Steady flow energy equation.

1st Application to turbine, Compressor  
 2nd concept of 2nd law of thermody-  
 3rd namics.  
 4th Kelvin-Planck statements.  
 5th Clausius statement.

6th  
 1st Application of second law in  
 2nd heat engine,  
 3rd Heat pump and Refrigerator.

4th  
 5th Calculation of heat engine  
 6th efficiency.  
 7th c.e.p. of heat pump and  
 refrigerator.



1st Year out of Simple problems.

2nd Cont - - -

5th- 3rd

4th

5th Gas and vapour, difference between them.

6th Laws of perfect gas.

1st Boyle's Law and Charles's Law.

2nd Avogadro's Law, Gay-Lussac Law.

9th- 3rd

4th

5th Dalton's Law of Partial Pressure.

6th General gas equation: derivation.

1st Characteristic gas constant.

2nd Ch. gas equation, universal gas

10th- 3rd constant, relation between them.

4th

5th State and eqn specific heats.

6th Relation between Cp and Cv

1st Enthalpy of a gas.

11th- 2nd work done during non-flow

3rd process.

4th Thermodynamic processes,

5th constant volume process.

6th constant pressure process.

1st constant temperature process

2nd Adiabatic process.

3rd Reversible and irreversible adiabatic processes.

12th- 4th

Polytropic process, work done

heat transfer.

H

6th Free expansion and throttling processes.

13th- 2nd

1st Problems on const vol. process.

3rd

" " Pressure "

H

4th

5th Problems on Isothermal process,

6th

Cont. Adiabatic process

14th- 2nd

3rd

1st Problems on Polytropic

4th

classification of I.C. engine.

5th

C.I and S.I. engine.

6th

Thermologies of I.C. engine - - -

7th

2-stroke, 4-stroke engine.

15th- 2nd

3rd

1st Carnot cycle, Otto cycle

4th

derivation of A.S.F.

5th

2nd Diesel cycle.

6th

Dual combustion cycle.

7th

5th Dual combustion cycle.

8th

1st simple problems.

Discipline/Section	Semester	3rd	Name of the Teaching Staff	Agnivesh Mishra
2021	No. of days/	EA	Semester from	01-9-2020
Subject	Thermal class Periods	EA	50	30-3-2021
Engg-I	allocated		Total No. classes	
Weeks	Day ↓			
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Discipline-Mecha.	Semester-4th	Name of the teaching
Mical		Pyramuresh Mishra
Subject - Theory	No. of days per week (4)	Commencement 20-4-2021
of machine		End of semester - 22-9-21

Week Day

Introduction to the subject, def. mechanism.

Link, types, characteristics of links.

Kinematic chain, mechanism types.

Inversion, Four bar mechanism. Libram, crank, double crank, double lever mechanism.

Inversions of Four bar mechanism.

Kinematic Pairs, Lower pair, higher pair.

Sliding pair, screw pair, - - -

Cam and followers.

Introduction to Friction, types of friction, laws of friction.

Friction between rail and screw - - -

Screw jack, load lifted required - - -

To lift the load and lower the load

Numerical problems on screw jack

Conf. - - -

Bearings, classification of bearings

Journal bearing, friction Circle

Definition of self-aligning ball bearings.

Thrust bearings, Flat pivot, conical pivot collar.

Torque transmission by Flat pivot bearing

Torque transmission by conical pivot - - -

Torque transmission by Flat collar bearing

Numerical Problems - - -

Workout Problems con. - - -

clutch, classification, Function.

Torque transmission in single plate clutch, working of single plate clutch.

Brakes, working

Working of Absorption type dynamometer.

Numerical Problems on simple clutches.

Conf. - - -

Power transmission concept.

Types of drives (Belt, gear and chain drive)

Velocity ratio. (belt drives)

Length of open and crossed belt.

wire and without slip.

Creep, Creeping

Ratio of belt tensions

Centrifugal tension and initial tension.

Power transmitted by the belt.

Numerical Problems.

V-belts and V-belt pulleys

- Gear drives and its terminology
- Simple and compound gear train
- Reverted and epicyclic gear train.

10th

Deflection of Governor, Function - classification of governor.

- Porter governor
- Working of Watt and Porter governor
- Working of Proell and Hartnell governor

11th

Sensitivity, stability, mechanism of governors.

- Fluctuation of speed and energy.
- Comparison between flywheel and governor.

12th

Concept of balancing, static and dynamic balancing of rotating parts (static) principles of balancing of reciprocating parts

- Causes and effect of unbalance.
- Difference between static and dynamic balancing
- Introduction to vibration causes

13th

and effects of vibration. Amplitude, time period, frequency, etc. classification of vibrations

14th

Natural, forced and damped vibration. Longitudinal, Torsional vibrations

- Remedies of vibration.
- Elimination of vibrations

15th

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