



NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (Jan-July 2025)

Name of Teacher: Karan Pal Singh

Designation: ASSISTANT PROFESSOR.

Subject Name: TD

Branch: ME

Semester: 3rd

Subject Code: PCC-ME-301/21

Date of Start: 23/07/2025 Total Load: 41 hrs

Date of Completion: 21/11/2025

Module/Unit-1: Fundamental Concepts.

S.No	Name of Topic	Hours
1	Fundamental Concepts: Introduction, System & Control volume; Types of systems, Property, State & Process; Concept of Thermodynamic Equilibrium, Quasistatic Process, Exact & Inexact differentials	3
2	Work - Thermodynamic definition of work; Displacement work; Path dependence of displacement work. Definition of heat; examples of heat/ work interaction in systems; Numerical Problems related to Heat and Work. (6)	3
	Total	6

Module/Unit 2: Temperature and First law

S.No	Name of Topic	Hours
1	Temperature and First law: Temperature, Definition of thermal equilibrium and Zeroth law; Temperature scales; Various Thermometers.	3
2	First Law for Cyclic & Non-cyclic processes	1
3	; Concept of total energy E; Energy: a property; Various modes of energy, Internal energy and Enthalpy. Numerical Problems on Thermometry and First Law. (7)	3
4		
	Total	7

Module/Unit-3: First Law for Flow Processes

S.No	Name of Topic	Hours
1	First Law for Flow Processes: Derivation of general energy equation for a control volume; Steady state steady flow processes;	1
2	; Examples of steady flow devices like nozzles, turbines, compressors and heat exchangers	2
3	Unsteady flow processes; Throttling and Free expansion processes. Numerical Problems on Steady Flow processes. (6)	3
4		
	Total	6

Module/Unit 4: Second Law of Thermodynamics and Entropy

S.No	Name of Topic	Hours
1	Second Law of Thermodynamics and Entropy: Definitions of direct and reverse heat engines; Definitions of thermal efficiency and COP;	2
2	Kelvin-Planck and Clausius statements and their equivalence; Definition of reversible process; Internal and external irreversibility	2
3	Carnot cycle; Carnot theorem; Absolute temperature scale.	2
4	Clausius inequality; Definition of entropy S ; Entropy S: a property; Principle of increase of entropy and its applications; Illustration of processes in T-s coordinates	2
5	Irreversibility and Availability, Availability function for systems and Control volumes undergoing different processes	2
6	Numerical Problems on Second law and Entropy. (12)	2
	Total	12

Module/Unit 5: Properties of Pure Substances and Gas Mixtures

S.No	Name of Topic	Hours
1	Properties of Pure Substances and Gas Mixtures: Definition of Pure substance,	1
2	Ideal Gases and ideal gas mixtures, Real gases,	2
3	Properties of two phase systems - Constant temperature and Constant pressure heating of water;	3
4	Definitions of saturated states; P-v-T surface; Use of steam tables and Mollier's chart; Identification of states & determination of properties,. Numerical Problems related to ideal gases and steam. (10)	4
	Total	10

Module/Unit 6: Thermodynamic Cycles

S.No	Name of Topic	Hours
1	Thermodynamic Cycles: Air Standard Otto,	3
2	Diesel and Dual cycles; their comparison;	3
3	Basic Brayton cycle. Numerical Problems. (9)	3
	Total	9

Recommended/ Reference Books:

1. Nag, P.K, Engineering Thermodynamics, Tata McGraw-Hill Publishing Co. Ltd.
2. Jones, J. B. and Duggan, R. E., Engineering Thermodynamics, Prentice-Hall of India
3. Moran, M. J. and Shapiro, H. N., Fundamentals of Engineering Thermodynamics, John Wiley and Sons.
4. Sonntag, R. E, Borgnakke, C. and Van Wylen, G. J., Fundamentals of Thermodynamics, John Wiley and Sons.

Web Links:-

- <https://nptel.ac.in/courses/112/105/112105266/> Unit 5 Properties of Pure Substances
- <https://nptel.ac.in/courses/112/104/112104113/> Unit 1 and 2: Fundamentals of Energy Conversion
- <https://nptel.ac.in/courses/101/104/101104063/> Unit 3 and 4 Laws of Thermodynamics 4
- <https://nptel.ac.in/courses/112/105/112105123/> Unit 6 Cycles Thermodynamic

Prof. (Dr.) Kuldeep Tomar

Signature of Teacher

Approved by HOD/Dean

Approved by IQAC Director/Dean Academics



NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (May-Dec 2025)

Name of Teacher: NITIN KUMAR

Designation: ASSISTANT PROFESSOR

Subject Name: STRENGTH OF MATERIALS-1

Branch: ME

Semester: 6

Subject code:-PCCME302/21

Date of Start: 23/7/25

Total Load: 44 .hrs

Date of Completion: 21/11/25

Module/Unit-1: Stress, Strain and Deformation of Solids

S.No	Name of Topic	Hours
1	Rigid bodies and deformable solids, Tension Compression and Shear Stresses, Hooke's law, Elastic constants and their relations	3
2	behavior of materials, Deformation of simple and compound bars, Thermal stresses, Volumetric strains,	3
3	Stresses on inclined planes, principal stresses and principal planes, Mohr's circle of stress	3
	Total	9

Module/Unit 2- Transverse Loading on Beams and Stresses in Beams

S.No	Name of Topic	Hours
1	Types of beams, Transverse loading, Shear force and bending moment in beams, Cantilevers, Simply supported beams and over-hanging beams	3
2	uniformly distributed and uniformly varying loads, Theory of bending of beams,	3
3	bending stress distribution and neutral axis, shear stress distribution, Load carrying capacity, Proportioning of section.	3
	Total	9

Module/Unit 3 - Deflection of Beams

S.No	Name of Topic	Hours
1	Double Integration method, Macaulay's method, Area moment method for computation of slopes and deflections in beams	5
2	Conjugate beam and strain energy, Castigliano's & Maxwell's theorems	4
	Total	9

Module/Unit 4 - Torsion:

S.No	Name of Topic	Hours
1	Torsion formulation stresses and deformation in circular and hollow shafts, Stepped Deflection in shafts fixed at the both ends	6
2	Stresses in helical springs, Deflection of helical springs, carriage springs	2

	Total	8
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Module/Unit 5: Thin Cylinders, Spheres and Thick Cylinders

S.No	Name of Topic	Hours
1	Stresses in thin cylindrical shell due to internal pressure, circumferential and longitudinal stresses and deformation in thin and thick cylinders	5
2	spherical shells subjected to internal pressure, Deformation in spherical shells, Lamé's theorem	4
	Total	9

TEXT BOOKS:

1. R. Subramanian, Strength of Materials, Oxford University Press

REFERENCE BOOKS:

1. Strength of Materials by G.H.Ryder, Macmillan Publishers India Limited.
2. Egor P. Popov, Engineering Mechanics of Solids, Prentice Hall of India, New Delhi.
2. R. Subramanian, Strength of Materials, Oxford University Press

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NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (JULY-DEC 2025)

Name of Teacher: DHEERAJ SHARMA

Designation: ASSISTANT PROFESSOR

Subject Name: FLUID MECHANICS AND FLUID MACHINES

Branch: ECE& ME

Semester: 3rd

Subject Code: PCC-ME-303/21

Date of Start: 23/07/2025

Total Load: 50 hrs

Date of Completion: 21/11/2025

Module/Unit-1 Introduction and Fluid Statics

S.No	Name of Topic	Hours
1	Definition of fluid, Newton's law of viscosity, properties of fluids, mass density	2
2	Specific volume, specific gravity	1
3	Viscosity and surface tension, Stability of floating Bodies and Submerged bodies,	3
4	Determination of metacentric height	1
	NUMERICAL PRACTICE	1
	Total	8

Module/Unit-2: Fluid Kinematics and Fluid Dynamics

S.No	Name of Topic	Hours
1	Different types of flows, Continuity equation, applications of continuity equation	2
2	Momentum equation and its applications, Euler's equation, Bernoulli's equation and its applications,	3
3	Venturimeter, Orificemeter, Rotameter	2
4	NUMERICAL PRACTICE	1
	Total	8

Module/Unit-3: Laminar flow through pipes and Boundary Layer

S.No	Name of Topic	Hours
1	Exact flow solutions in channels and ducts,	1
2	Couette and Poiseuille flow, laminar flow through circular conduits	1
3	concept of boundary layer, measurement of boundary layer thickness	2
4	Von-Karman integral Momentum equation for boundary layer, Darcy Weisbach equation, friction factor	2
5	NUMERICAL PRACTICE	1
	Total	7

Module/Unit 4-. Dimensional Analysis

S.No	Name of Topic	Hours
1	Need for dimensional analysis, methods of dimension analysis	1
2	Similitude, types of similitude, Dimensionless parameters,	2
3	Application of dimensionless parameters, similitude laws, Model testing, Model testing of turbines and pumps	3
4	Numerical practise	1
	Total	7

Module/Unit-5: Hydraulic Turbines

S.No	Name of Topic	Hours
1	Euler's equation, theory of Rotodynamic machines, Introduction to hydro power plan	2
2	Classification of water turbines, heads and efficiencies, velocity triangles, Pelton turbine, Francis turbine, Kaplan turbines and their working principles,	4
3	Draft tube, Specific speed, unit quantities, performance curves for turbines, governing of turbines, Numerical Problems.	4
	Total	10

Module/Unit 6: Pumps

S.No	Name of Topic	Hours
1	Centrifugal pumps: working principle, various heads and efficiencies	2
2	Velocity components at entry and exit of the rotor, velocity triangles, work done by the impeller, performance curves	4
3	Reciprocating pump: Classifications, working principle, Indicator Diagram, Numerical Problems.	4
	Total	10

Recommended/ Reference Books:

- 1 Mechanics of Fluids – I H Shames; McGraw Hill
- 2. Fluid Mechanics and Fluid Power Engineering – D.S. Kumar; S.K. Kataria and Sons.
- 3. Introduction to Fluid Mechanics and Fluid Machines – S.K. Som and G. Biswas; TMH Publications, New Delhi.
- 4. Fluid Mechanics – Streeter V L and Wylie E B; McGraw Hill
- 5. Fluid Mechanics and Machinery – S.K. Agarwal; TMH; New Delhi.
- 6. Fluid Mechanics by Frank M. White; McGraw Hill.

Web Links:

S.No. Address of web source

1. <https://nptel.ac.in/courses/112/104/112104118/>
2. <https://nptel.ac.in/courses/112/104/112104117/>
3. <https://nptel.ac.in/courses/112/105/112105183/>
4. <https://nptel.ac.in/courses/112/105/112105171/>

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NGF COLLEGE OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN (July-Dec 2025)

Name of Teacher: Usha Bhardwaj

Designation: Assitant Professor

Subject Name: BEE Branch:ME(Semester:3rd)

Subject Code:ESC-201

Date of Start: 21/07/2025 Total Load: 29hrs

Date of Completion: 20/11/2025

Module/Unit-1: Semiconductor Devices And Applications

S.No	Name of Topic	Hours
1	Introduction to P-N junction Diode and V-I characteristics	50min
2	Half wave and Full-wave rectifiers	50min
3	capacitor filter, Zener diode and its characteristics	50min
4	Zener diode as voltage regulator.	50min
5	Regulated power supply IC based on 78XX and 79XX series	50min
6	Introduction to BJT, its input-output and transfer characteristics	50min
7	BJT as a single stage CE amplifier	50min
8	JT as a single stage CE amplifier	50min
	Total	400min=6.6hrs

Module/Unit 2- Operational Amplifier and its Applications

S.No	Name of Topic	Hours
1	Introduction to operational amplifiers	50min
2	Op-amp input modes and parameters	50min
3	Op-amp in open loop configuration, op-amp with negative feedback	50min
4	study of practical op-amp IC 741,	50min
5	inverting and non-inverting amplifier applications: summing and difference amplifier	50 min
6	unity gain buffer, comparator.	50min
7	integrator and differentiator	50min
	Total	350min=5.8hrs

Module/Unit 3-

S.No	Name of Topic	Hours
1	RC-timing circuits	50min
2	RC-timing circuits	50min
3	positive feedback, Barkhausen's criteria for oscillation	50min
4	R-C phase shift and Wein bridge oscillator	50min
	Total	200min=3.3hrs

Module/Unit 4- Digital Electronics Fundamentals

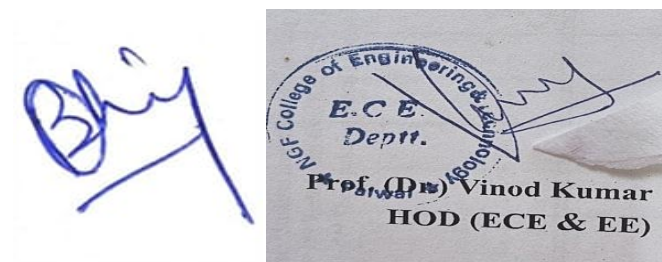
S.No	Name of Topic	Hours
1	Difference between analog and digital signals	50min
2	Boolean algebra, Basic and Universal Gates	50min
3	Symbols, Truth tables	50min
4	logic expressions, Logic simplification using K map	50min
5	Logic ICs	50min
6	half and full adder/sub tractor	50min
7	multiplexers, de-multiplexers, flip-flops	50min
8	shift registers, counters	50min
9	Block diagram of microprocessor/micro-controller and their applications	50min
	Total	450min=7.5hrs

Module/Unit 5-.Electronic Communication System

S.No	Name of Topic	Hours
1	the elements of communication system	50min
2	IEEE frequency spectrum	50min
3	transmission media: wired and wireless	50min
4	transmission media: wired and wireless	50min
5	Mobile communication system	50 min
6	cellular concept and block diagram of GSM system	50min
	Total	300min=5hrs

TEXT BOOKS/REFERENCE BOOKS:

1. Floyd ,” Electronic Devices” Pearson Education.
2. R.P. Jain , “Modern Digital Electronics”, Tata Mc Graw Hill.
3. Frenzel, “Communication Electronics: Principles and Applications”, Tata Mc Graw Hill.



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NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (JULY-DEC 2025)

Name of Teacher: DHEERAJ SHARMA

Subject Name: ENGINEERING MECHANICS

Semester: 3rd

Date of Start: 23/07/2025

Total Load: 47 hrs

Designation: ASSISTANT PROFESSOR

Branch: ME

Subject Code: ECE/203A/21

Date of Completion: 21/11/2025

Module/Unit-1: Introduction to Engineering Mechanics

S.No	Name of Topic	Hours
1	Force Systems: Basic concepts, Particle equilibrium in 2 D & 3-D, Rigid Body equilibrium.	2
2	System of Forces: Coplanar and Concurrent Forces, Components of forces in Space, Resultant	1
3	Moment of Forces and its Application	3
4	Couples, Equilibrium of System of Forces, Equations of Equilibrium of Coplanar Systems and Spatial Systems. (8)	1
	NUMERICAL PRACTICE	1
	Total	8

Module/Unit-2: FRICTION

S.No	Name of Topic	Hours
1	Friction: Types of friction, Limiting friction, Laws of Friction,	1
2	Static and Dynamic Friction; Motion of Bodies,	1
3	wedge friction, screw jack & differential screw jack.	2
4	NUMERICAL PRACTICE	1
	Total	5

Module/Unit-3: Structural Analysis

S.No	Name of Topic	Hours
1	Structural Analysis: Equilibrium in three dimensions. Trusses ,	1
2	Method of Joints with example	1
3	Method of Sections with example practise	2
4	Zero force members. Beams & types of beams	1
5	Frames & Machines.	2
	Total	7

Module/Unit 4-. Centroid and Centre of Gravity

S.No	Name of Topic	Hours
1	Centroid of simple figures from first principle, centroid of composite sections	1
2	Centre of Gravity; Area moment of inertia- Definition, Moment of inertia of plane sections from first principles,	2
3	Theorems of moment of inertia, Moment of inertia of standard and composite sections; Mass moment inertia of circular plate, Cylinder, Cone, Sphere, Hook.	3
4	Numerical practise	1
	Total	7

Module/Unit-5: . Virtual Work and Energy Methods

S.No	Name of Topic	Hours
1	Virtual displacements, Principle of virtual work for particle and ideal system of rigid bodies, Degrees of Freedom. Active force diagram	2
2	systems with friction, mechanical efficiency	2
3	.Conservative forces and potential energy (elastic and gravitational), energy equation for equilibrium. Applications of energy method for equilibrium. Stability.	2
	Total	7

Module/Unit 6-.. Particle dynamics

S.No	Name of Topic	Hours
1	Particle dynamics: Rectilinear motion, Plane curvilinear motion (rectangular, path, and polar coordinates). 3-D curvilinear motion; Relative and constrained motion;	3
2	Newton's 2nd law (rectangular, path, and polar coordinates).	2
3	Work-kinetic energy, power, potential energy. Impulse momentum (linear, angular); Impact (Direct and oblique).	3
	Total	8

Module/Unit 7- Kinematics and Kinetics of Rigid Bodies

S.No	Name of Topic	Hours
1	Kinematics and Kinetics of Rigid Bodies: Basic terms, general principles in dynamics; Types of motion,	2
2	Instantaneous centre of rotation in plane motion and simple problems;	1
3	D' Alembert's principle and its applications in plane motion and connected bodies;	1
4	Work energy principle and its application in plane motion of connected bodies; Kinetics of rigid body rotation. (8)	1
	Total	5

Recommended/ Reference Books:

1. Irving H. Shames, Engineering Mechanics, Prentice Hall
2. F. P. Beer and E. R. Johnston, Vector Mechanics for Engineers, Vol I - Statics, Vol II, – Dynamics, Tata McGraw Hill
3. R. C. Hibbler, Engineering Mechanics: Principles of Statics and Dynamics, Pearson Press.
4. Hibler and Gupta, Engineering Mechanics (Statics, Dynamics) by Pearson Education.
5. Reddy Vijaykumar K. and K. Suresh Kumar, Singer's Engineering Mechanics.
6. Bansal R.K., A Text Book of Engineering Mechanics, Laxmi Publications.
7. Khurmi R.S., Engineering Mechanics, S. Chand & Co.

8. Tayal A.K., Engineering Mechanics, Umesh Publications.

9. Engineering Mechanics , D. S kumar

10. Engineering Mechanics by R. K Rajput

Web Links:

S.No.	Address of web source	Content
1.	https://youtu.be/tJw_-gx-i-0	Principle of Virtual Work: Lecture- 1
2.	https://youtu.be/6n61rjociHQ	Principle of Virtual Work: Lecture- 2
3.	https://youtu.be/zGsGupbv_SI	Energy Relations
4.	https://youtu.be/VQRcChR9IkU	Friction- Lecture- 1
5.	https://youtu.be/jpvt1D4jG9w	Friction- Lecture- 2
6.	https://youtu.be/BytusqcT_F0	Friction- Lecture- 3
7.	https://youtu.be/LBMHPeJNB4E	Particle Dynamics
8.	https://youtu.be/3-aNY5FtU6k	Circular Motion

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NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (Jan-July 2025)

Name of Teacher: Radhe Shyam

Designation: Assistant Professor

Subject Name: Probability & Statistics

Branch: EE/ME

Semester: 3rd

Subject Code: ELPS321

Date of Start: 23/07/2025

Total Load: ...40..hrs

Date of Completion: 22/11/2025

Module/Unit-1:

S.No	Name of Topic	Hours
1	Basic Probability	50 MIN
2	Conditional Probability	50 MIN

3	Independence: Discrete random variables	50 MIN
4	Independent random variables	50 MIN
5	Poisson Approximation to the binomial distribution	50 MIN
6	Moments, Variance of Sum	50 MIN
7	Correlation & Chebyshev's Inequality	50 MIN
	Total	5.8HOURS

Module/Unit 2

S.No	Name of Topic	Hours
1	Continuous random variables and their properties	50 MIN
2	Distribution functions and densities	50 MIN
3	Normal Densities	50 MIN
4	Exponential Densities	50 MIN
5	Gamma densities	50 MIN
	TOTAL	4.1 HOURS

Module/Unit 3

S.No	Name of Topic	Hours
1	Bivariate Distribution And their properties	50 MIN
2	Distribution of sum and quotients	50 MIN
3	Conditional Densities	50 MIN
4	Bayes' rule	50 MIN
	TOTAL	3.3 HOURS

Module/Unit 4

1	Measures of central tendency (Moments, Skewness and Kurtosis)	50 MIN
2	Probability Distribution	50 MIN
3	Binomial, Poisson and Normal	50 MIN
4	Correlation and regression	50 MIN
	TOTAL	3.3 HOURS

Module/Unit 5

1	Curve fitting by methods of least squares	50 MIN
2	Fitting of straight lines	50 MIN
3	Second degree Parabolas	50 MIN
4	More general curves	50 MIN
5	Test of significance	50 MIN
6	Large sample test for single proportion	50 MIN
7	Difference of proportions	50 MIN
8	Single mean, difference of mean and diff. Of standard deviation	50 MIN
	TOTAL	6.67 HOURS

Module/Unit 6

1	Test of single mean, diff. of means and correlation coefficients	50 MIN
2	Test for ratio of variance	50 MIN
3	Chi-square test for goodness of fit	50 MIN
	TOTAL	2.5 HOURS

TEXT BOOKS & REFERENCE BOOKS:

- Gupta & Kapoor, Fundamentals of Mathematical Statistics.
- Murray R. Spiegel, Schaum's Outline of Probability and Statistics.
- Sheldon Ross, Introduction to Probability and Statistics for Engineers and Scientists.
- Jay L. Devore, Probability and Statistics for Engineering and the Sciences.



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NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (JULY-NOV 2025)

Name of Teacher: Ms. Anisha

Designation: Asst. Prof.

SubjectName: BIOLOGY

Branch: ME

Semester:3rd

Subject Code: BSC-01

Date of Start: 21-7-25

Total Load: 28.hrs

Date of Completion: 2-12-2025

Module/Unit-1: INTRODUCTION.

S.No	Name of Topic	Hours
1	Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft.	50 Min
2	Why we need to study biology?	50 Min
3	Discuss how biological observations of 18th Century that lead to major discoveries.	50 min
4	Brownian motion and the origin of thermodynamics by referring to the original observation of Robert Brown and Julius Mayor. These examples will highlight the fundamental importance of observations in any scientific Inquiry	50 min

	Total	3hrs 20 min

Module/Unit 2-CLASSIFICATION ..

S.No	Name of Topic	Hours
1	Discuss classification based on (a) cellularity- Unicellular or multicellular (b) ultrastructure- prokaryotes or eucaryotes. (c) energy and Carbon utilisation -Autotrophs heterotrophs, lithotrophes (d) Ammonia excretion - aminotelic, uricotelic, ureotelic (e) Habitata aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. A given organism can come under different category based on classification.	50 Min
2	. Model organisms for the study of-biology come from different groups. E.coli, S.cerevisiae, D. Melanogaster, C. elegans, A. Thaliana, M. Musculus.	50 Min
	Total	1hr40min

Module/Unit 3 Genetics..

S.No	Name of Topic	Hours
1	Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping. Gene interaction, Epistasis.	50 min
2	Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance.	50 min
3.	Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics.	50 min
	Total	2hr 30 min

Module/Unit 4 BIO MOLECULES ..

S.No	Name of Topic	Hours
1	Molecules of life. In this context discuss monomeric units and polymeric structures. Discuss about sugars, starch and cellulose.	50 Min
2	Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	50 Min
	Total	1hr 40 min

Module/Unit 5 ENZYMES ..

S.No	Name of Topic	Hours
1	Enzymology: How to monitor enzyme catalysed reactions. How does an enzyme catalyse reactions? Enzyme classification. Mechanism of enzyme action.	50 Min
2	Discuss at least two examples. Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis.	50 Min
	Total	1hr 40 min

Module/Unit 6 INFORMATION TRANSFER .

S.No	Name of Topic	Hours
1	Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure-from single stranded to double helix to nucleosomes	50 Min
2	Concept of genetic code. Universality and degeneracy of genetic code. Define gene in terms of complementation and recombination.	50 Min
	Total	1hr 40 min

Module/Unit 7- MACROMOLECULAR ANALYSIS ..

S.No	Name of Topic	Hours
1	Proteins- structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure.	50 Min
2	Proteins as enzymes, transporters, receptors and structural elements.	50 Min
	Total	1hr 40 min

Module/Unit 8 METABOLISM..

S.No	Name of Topic	Hours
1	Thermodynamics as applied to biological systems. Exothermic and endothermic versus endergonic and exergoinc reactions. Concept of Kegand its relation to standard free energy. Spontaneity. ATP as an energy currency.	50 Min
2	This should include the breakdown of glucose to CO ₂ + H ₂ O (Glycolysis and Krebs cycle) and synthesis of glucose from CO ₂ and H ₂ O (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy Charge.	50 Min
	Total	1hr 40 min

Module/Unit 9 MICROBIOLOGY..

S.No	Name of Topic	Hours
1	Concept of single celled organisms. Concept of species and strains. Identification and classification of microorganisms.	50 Min
2	Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics.	50 Min
	TOTAL	1hr 40 min

TEXT BOOKS:

- 1.
- 2.
- 3.

REFERENCE BOOKS:

- 1.
- 2.
- 3.
- 4.

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NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (May-Dec 2025)

Name of Teacher: NITIN KUMAR Designation-ASSISTANT PROFESSOR

Subject Name: HEAT AND MASS TRANSFER

Branch: ME

Semester: 5th

Subject code: PCC-ME501/21

Date of Start: 23/7/25

Total Load: 36 Hrs

Date of Completion: 21/11/25

Module/Unit-1: Introduction and Modes of Heat Transfer

S.No	Name of Topic	Hours
1	Introduction to three modes of heat transfer, Derivation of heat balance equation- Steady state one dimensional solution for conduction, heat transfer in Cartesian, cylindrical and spherical geometry	4
2	critical insulation thickness, lumped system approximation and Biot number, heat transfer through extended surfaces, one dimensional conduction solutions for unsteady state heat transfer- approximate solution by the use of Heissler charts	5
	Total	9

Module/Unit 2- Heat Convection

S.No	Name of Topic	Hours
1	Heat convection, basic equations such as continuity equation and momentum equation, introduction to boundary layer, laminar and turbulent	4

	flow, external and internal flows flow over flat plate and circular pipes), Natural convective heat transfer- Dimensionless parameters or forced and free convection heat transfer	
2	Correlations for forced and free convection- Approximate solutions to laminar boundary layer equations (momentum and energy) for both internal and external flow, Estimating heat transfer rates in laminar flow situations using appropriate correlations for free and forced convection (flat plate and circular pipes). Numerical Problems	4
	Total	8

Module/Unit 3 Radiation Heat Transfer

S.No	Name of Topic	Hours
1	Interaction of radiation with materials, definitions of radiative properties, Stefan Boltzmann's law, black and gray body radiation, Wein's law, Kirchhoff's law,	4
2	Calculation of radiation heat transfer between surfaces using radiative properties view factors and the radiosity method, Thermocouple error in temperature measurement. Numerical Problems	4
	Total	8

Module/Unit 4 -Heat Exchanger

S.No	Name of Topic	Hours
1	Types of heat exchangers, uses of different types of heat exchangers dimensionless numbers for heat exchanger design	2
2	Analysis and design of heat exchangers using both LMTD and ϵ - NTU methods. Numerical Problems	2
	Total	4

Module/Unit 5 -Mass Transfer

S.No	Name of Topic	Hours
1	Basic of Boiling and Condensation heat transfer, Pool boiling curve	2
2	introduction to heat pipe. Numerical Problems	2
	Total	4

Module/Unit 6 -Numerical Methods in Heat Transfer Analysis

S.No	Name of Topic	Hours
1	Introduction to numerical methods, Finite difference approximation, Steady	3

	state numerical methods	
	Total	3

TEXT BOOKS

. D. S. Kumar, Heat and Mass Transfer, S.K.Kataria, Publication

REFERENCE BOOKS:

1. J. P. Holman, Heat Transfer, Tenth Edition, McGraw Hill.
2. Yunus A Cengel, Heat Transfer : A Practical Approach, McGraw Hill.
3. D. S. Kumar, Heat and Mass Transfer, S.K.Kataria, Publication

Signature of Teacher

Approved by HOD/Dean

Approved by IQAC Director/Dean Academics



NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (Jan-July 2025)

Name of

Teacher: Dheeraj Sharma

Designation: Asstt. Prof.

Subject Name: DOM

Branch: ME

Semester: 5th

Subject Code: PCC-ME-502/21

Date of Start: 14/7/25

Total Load: 39 hrs

Date of Completion: 21/11/2025

Module/Unit-1: .Static and Inertia Force Analysis

S.No	Name of Topic	Hours
1	Static and Inertia Force Analysis: Static force analysis of planer mechanisms,.	2
2	dynamic force analysis including inertia and frictional forces of planer mechanism	2
3	D-Alembert's Principle, Forces on the reciprocating parts of an engine considering friction and inertia of moving parts, dynamically equivalent system,	2
4	Torque exerted on the crank shaft, considering the weight of the connecting rod.	3
	Total	9

Module/Unit 2-.Balancing

S.No	Name of Topic	Hours
1	Balancing: Balancing rotating mass in single and several planes,	2
2	Balancing of reciprocating engine, concept of Partial balancing,	3
3	Primary and secondary balancing of multi-cylinder inline engine and radial engine, Method of direct and reverse cranks.	3
	Total	8

Module/Unit-3: Governors

S.No	Name of Topic	Hours
1	Governors: Types of Governor, Watt Governor, Porter governor	1
2	Proell Governor, Hartnell Governor, ,	3
3	Sensitivity, Stability, Isochronisms, Hunting, Governor Effort and Power, controlling force. (8)	3
4	Wilson-Hartnell governor	1
	Total	8

Module/Unit 4-.Gyroscopic effect

S.No	Name of Topic	Hours
1	Gyroscopic effect: Spinning and precession, gyroscopic couple,	1
2	Effect of Gyroscopic couple on the stability of automotive vehicles: Stability of four wheelers	2
3	Stability of two wheelers.	2
	Total	5

Module/Unit 5-.Mechanical Vibrations

S.No	Name of Topic	Hours
1	Mechanical Vibrations: Causes of Vibrations, Harmful and useful effects of vibrations, methods of reducing undesirable vibrations,	2
2	Basic Definitions, Types of Vibrations, Elements of vibrating system, Equivalent stiffness of springs, Equivalent damping coefficient of dampers,	3
3	methods of vibration analysis, Damped Vibrations, Vibration Isolation, Forced damped vibrations, Whirlings of shafts, Longitudinal vibrations, Transverse Vibrations, Torsional Vibrations. (9)	4
	Total	9

Recommended/ Reference Books:

1. Theory of Machines and Mechanisms: Joseph Edward Shigley and John Joseph Uicker, Jr.

Second Edition, MGH, New York.

2. Theory and Machines: V.P. Singh, Dhanpat Rai & Company.

3. Theory and Machines: S.S. Rattan, Tata McGraw Hill.

4. Mechanism and Machines: J S Rao,

Web Link_

Mechanical Engineering - Dynamics of Machines - NPTEL nptel.ac.in

Whole Syllabus

<https://youtu.be/PCOp1AYrDO>

Vibration of Damped SDF system

Signature of Teacher

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NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (JULY-DEC 2025)

Name of Teacher: NITIN KUMAR

Designation: ASSISTANT PROFESSOR

Subject Name: DESIGN OF MACHINE ELEMENTS-I

Branch: ME

Semester: 5th

Subject Code:PCC-ME503/21

Date of Start: 23/07/2025 Total Load: 50 hrs

Date of Completion: 21/11/2025

Module/Unit-1:Principles of Mechanical Design

S.No	Name of Topic	Hours
1	General considerations, Ergonomic and value engineering considerations in design	1
2	Role of processing in design, Design considerations for casting, forging and machining, Procedure of design of machine elements, Engineering materials and their mechanical properties,	2
3	Selection of material, theories of failures, static loading, factor of safety under different loading conditions, stress concentration	2
4	Concept of fatigue failures for dynamic loading	1
	Total	6

Module/Unit-2: Mechanical Joints

S.No	Name of Topic	Hours
1	Design of riveted and welding joints under different static load conditions	4
2	Design of screwed joints against static and eccentric loading	5

3	Design of cotter joints and knuckle joint	5
	Total	14

Module/Unit-3: Keys & Couplings:

S.No	Name of Topic	Hours
1	Design of different type of keys; sunk key, saddle key, tangent key, round key and splines	3
2	Design of different shaft couplings against torque	3
3	Rigid & Flexible couplings	2
4		
	Total	8

Module/Unit 4: Transmission Shafts:

S.No	Name of Topic	Hours
1	Design of shaft subjected to static loading: pure torsion, simple bending, combined bending and torsion	2
2	combined bending torsion and axial loads,	2
3	Design of shafts for fluctuating loads.	2
	Total	6

Module/Unit-5: Springs

S.No	Name of Topic	Hours
1	Terminologies of springs, Different type of springs	1
2	Design of helical springs for static & dynamic loading, Eccentric loading, Surge in springs,	3
3	Springs in series & parallel connection	2
4	Type and design of leaf springs	2
	Total	8

Module/Unit 6:Clutches & Brakes

S.No	Name of Topic	Hours
1	Various types of clutches, Design of friction clutches;	2
2	Single plate clutch, Multi-plate clutch, Cone clutch and Centrifugal clutch, Block Brake with Shoe, Pivoted Block Brake with Shoe	3

3	Internal Expanding Brake, Band Brakes, Disk Brakes	2
4	Thermal Considerations of Brakes.	1
5		
6		
	Total	8

Recommended/ Reference Books:

1. Mechanical Engineering Design: Joseph Edward Shigley- MGH, New York.
2. Design of Machine Elements – V.B. Bhandari – MGH.
3. Norton, R. L., Machine design: an integrated approach, Prentice Hall.

Web Links:

S.N	Address of web source	Content
1	https://www.youtube.com/watch?v=mWO_xrzk-vs	Design of Mechanical Joints
2	https://www.slideshare.net/MohamedMohamedElSayed1/	keys-and-coupling Design of Key & Couplings.
3	https://nptel.ac.in/content/storage2/courses/112105125/pdf/mod8les1.pdf	Design of Shafts
4	https://nptel.ac.in/content/storage2/courses/112105125/pdf/mod7les1.pdf	Design of Springs
5	https://www.scribd.com/document/282172961/MachineDesign-Design-of-Clutches	Design of Clutches

Signature of Teacher Approved by HOD/Dean Approved by IQAC Director/Dean Academics



NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (May-Dec 2025)

Name of Teacher: NITIN KUMAR

Designation-ASSISTANT PROFESSOR

Subject Name: REFRIGERATION & AIR CONDITIONING

Branch: ME

Semester: 5

Subject code: PCC-ME504/21

Date of Start: 23/7/25

Total Load: .40.hrs

Date of Completion: 21/11/25

Module/Unit-1: .Basic of Refrigeration and Air refrigeration.....

S.No	Name of Topic	Hours
1	<i>Methods of refrigeration, Industrial Refrigeration; Unit of refrigeration; Coefficient of performance (COP) Refrigerants- Definition, Classification</i> Nomenclature, Desirable properties, Comparative study, secondary refrigerants, Introduction to ecofriendly new Refrigerants and their analysis Refrigerants mixtures: properties and characteristics -	3
2	Ozone depletion and global warming issues. Air Refrigeration Systems: Brayton refrigeration or the Bell Coleman air refrigeration cycle; Air-craft refrigeration systems, Simple cooling and Simple evaporative types, Boot strap and Boot strap evaporative types	3
3	Regenerative type and Reduced Ambient type system, comparison of different air refrigeration systems, advantages and disadvantages of air refrigeration cycle, Actual air conditioning system with controls	2
	Total	8

Module/Unit 2-Vapour Compression Refrigeration

S.No	Name of Topic	Hours
1	VC cycle on P-V, T-S and PH diagrams; Effects of operating conditions on COP; Cooling and superheating; Comparison of VC cycle with Air Refrigeration cycle. Super critical vapour compression cycle. Multistage Vapour Compression (VC) Refrigeration Systems: Necessity of compound compression, Compound VC cycle ,	4
2	Multistage compression with flash inter-cooling and / or water inter-cooling; systems with individual or multiple expansion valves Production of low temperatures: Introduction to Cryogenics, Multistage refrigeration system, Two and three stage cascade systems	4
	Total	8

Module/Unit 3 - Other Refrigeration Systems:

S.No	Name of Topic	Hours
1	Vapour Absorption Systems, Practical Ammonia Absorption System, COP of the Absorption System, Lithium Bromide-Water Absorption Refrigeration Systems and Electrolux Refrigeration system	3
2	Solar energy (Solar Concentrator) based absorption refrigeration systems, Vapour jet, thermoelectric and Vortex tube refrigeration, Relative merits and demeri	3
	Total	6

Module/Unit 4 -Psychrometric & Air Conditioning Processes

S.No	Name of Topic	Hours
1	Properties of moist Air, Gibbs Dalton law, Specific humidity, Degree of saturation, Relative humidity, Enthalpy, Humid specific heat, Wet bulb temp.,	3
2	Thermodynamics wet bulb temp, Psychrometric chart; Psychrometric of air-conditioning processes, Psychrometric processes in air washer, Numerical Problems	2
	Total	5

Module/Unit 5 - Heating and cooling load calculation for HVAC system design:

S.No	Name of Topic	Hours
1	Outside and inside design conditions; Sources of cooling load and heating load, Heat transfer through structure, Solar radiation	3
2	Electrical appliances, Infiltration and ventilation, Heat generation inside conditioned space; Comfort and industrial air conditioning, Load calculations and Heat pumps, Numerical Problems	3
	Total	6

Module/Unit 6 -Equipment selection for HVAC system:

S.No	Name of Topic	Hours
1	Air distribution system; Basic of Duct systems design; Filters; Refrigerant piping; Design of summer air-conditioning and Winter air conditioning systems	3
2	. Temperature sensors, Pressure sensors, Humidity sensors, Actuators, Safety controls; Accessories, Different types of compressor used in refrigeration	4

	.	
	Total	7

TEXT BOOKS:

1. Refrigeration and Air Conditioning by D.S.Kumar, S.K.Kataria & Sons, New Delhi

REFERENCE BOOKS:

1. Refrigeration & Air conditioning –R.C. Jordan and G.B. Priester, Prentice Hall of India.
2. Refrigeration & Air conditioning –C.P. Arora, TMH, New Delhi.
3. A course in Refrigeration & Air Conditioning –Arora & Domkundwar, Dhanpat Rai & sons.

Signature of Teacher

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Approved by IQAC Director/Dean Academics



NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (JULY-DEC 2025)

Name of Teacher: KARAN PAL SINGH Designation: ASSISTANT PROFESSOR

Subject Name: INDUSTRIAL ENGINEERING

Branch: ME

Semester: 7th

Subject Code: PEC-ME-505/21

Date of Start: 23/07/2025 Total Load: 36 hrs

Date of Completion: 21/11/2025

Module/Unit-1: Production system and Productivity

S.No	Name of Topic	Hours
1	History of Industrial Engineering, Introduction, aim and generalized model of Production systems	2
2	Types of production system, Plant location, Plant layout, objectives and types	2
3	Productivity, various methods of productivity measurement, Factors effecting productivity	2
4	, Strategies for improving productivity, Industry 4.0.	2
	Total	8

Module/Unit-2: Manufacturing Cost Analysis

S.No	Name of Topic	Hours
1	Fixed & variable costs, Direct, indirect & overhead costs, & Job costing, Recovery of overheads, Standard costing	2

2	Cost control, Cost variance Analysis - Labour, material, overhead in volume, rate & efficiency, Break even analysis	2
3	ISO standards, MFCA (material flow cost accounting), Lean manufacturing	3
4	Numerical Problems	1
	Total	7

Module/Unit-3: Work Study

S.No	Name of Topic	Hours
1	Definition, Objectives, Method study, Principle of motion economy	1
2	Techniques of method study – Various charts, THERBLIGS, Work measurement - various methods	2
3	Time Study - PMTS, determining time, Work sampling	2
4	Numerical problems	1
	Total	6

Module/Unit 4: Materials Management

S.No	Name of Topic	Hours
1	Definition, importance of materials management in manufacturing industries,	1
2	Inventory control models - Economic order quantity (EOQ), Economic batch quantity (EBQ) with & without shortage,	2
3	Inventory control models - Economic order quantity (EOQ), Economic batch quantity (EBQ) with & without shortage	4
4	Numerical problems	1
	Total	8

Module/Unit-5: Forecasting

S.No	Name of Topic	Hours
1	Importance, Objectives, Forecasting and Prediction	2
2	Types, Classification of Forecasting Methods,	2
3	Forecast Errors, Costs and accuracy of forecasts	2
4	Numerical problems	1
	Total	7

Module/Unit 6: Production Planning & Control

S.No	Name of Topic	Hours
1	Objectives & variables of PPC, Aggregate planning, Decision options - Basic & mixed strategies, Master production schedule (MPS)	3
2	Scheduling Operations, Gantt chart, Sequencing - Johnson algorithm for n-Jobs-2 machines, n- Jobs-3 machines, 2 Jobs n-machines, n-Jobs m-machines	3
3	Introduction to quality and Inventory turnover ratio	1
4	Numerical Problems	1
	Total	8

Recommended/ Reference Books:

1. Production & Operations Management – Chary, TMH, New Delhi.
2. Modern Production Management – S.S. Buffa, Pub. John Wiley.
3. Industrial Engineering and Production management, M. Mahajan, Dhanpat Rai.
4. Operation Management - Monks, McGraw Hill ISE.
5. Production & Operations Management - Martinich, John Wiley SE.
6. Industrial & Systems Engineering - Turner, Mize, Case, Prentice Hall Pub.
7. Industrial Engineering & Operations Management – SK Sharma, Pub-S. K.Kataria
8. Industrial Engineering – Ravi Shankar, Galgotia Pub.

Web Links:

S.No.	Address of web source	Content
1.	https://www.youtube.com/watch?v=nm9Qv4w_AEO	Unit -1
2.	http://nptel.ac.in/courses/112107142/	Unit -3
3.	https://www.youtube.com/watch?v=0Op01S8-t-E	Unit-4
4.	http://nptel.ac.in/courses/112107143/	Unit-6

Signature of Teacher

Approved by HOD/Dean

Approved by IQAC Director/Dean Academics

**NGF COLLEGE OF ENGINEERING & TECHNOLOGY****DEPARTMENT OF ELECTRICAL ENGINEERING****LESSON PLAN (JULY-DEC 2025)**

Name of Teacher: Dheeraj Sharma

Designation: Asstt. Prof.

Subject Name: EITK

Branch: ME

Semester: 5th

Subject Code :MC-02

Date of Start: 23/07/2025

Total Load: 23 hrs

Date of Completion: 21/11/2025

Module/Unit-1: .Introduction of Traditional Knowledge

S.No	Name of Topic	Hours
1	Introduction of Traditional Knowledge: Indian traditional knowledge of social, science, medicines, warfare, judiciary etc.	3
	Total	3

Module/Unit 2-.Ancient Indian scriptures

S.No	Name of Topic	Hours
1	Ancient Indian scriptures: Veda--- Meaning, Types of Vedas-- Rig-Veda, Sama-Veda, Yajur-Veda, and Atharva-Veda	2
2	Upveda---Meaning, types of upveda, Description of each upveda	3
3	; Vedang--- Meaning, no. of Vedang, Description of each Vedang;	3
4	Updesha: Dharmshastra, Mimamsa, Puran, Tarkshastra., Important scriptures of scripture of other religions	2
	Total	10

Module/Unit-3: Modern Science and Indian Knowledge System

S.No	Name of Topic	Hours
1	Modern Science and Indian Knowledge System: Various field of Indian knowledge; Communication, Mathematics, Phonetics, Metaphysics and Philosophy, Life Sciences, Medical Sciences, Cosmology, Military Science etc	2
2	Various field of Indian knowledge; Phonetics, Metaphysics and Philosophy, Life Sciences, Medical Sciences, Cosmology, Military Science etc	2
	Total	4

Module/Unit 4.Yoga and Holistic Health care

S.No	Name of Topic	Hours
1	Yoga and Holistic Health care: Introduction, Yogic Concepts of Wellbeing,.	1
2	Relationship between Health and Disease, Maintain wellbeing,Aurveda	2
	Total	3

Module/Unit 5-.Case study of development of an Aurvedic treatment centre

S.No	Name of Topic	Hours
1	Case study of development of an Aurvedic treatment centre; Patanjali;	2
2	Development of Yoga as World Yoga Divas; any other case study related to Indian traditions	1
	Total	3

Recommended/ Reference Books:

- 1) V. Sivaramakrishnan (Ed.), Cultural Heritage of India-course material, Bharatiya,VidyaBhavan, Mumbai.
- 2) Swami Jitatmanand, Modern Physics and Vedant, Bharatiya VidyaBhavan□
- 3) Swami Jitatmanand, Holistic Science and Vedant, Bharatiya VidyaBhavan□
- 4) Fritzof Capra, Tao of Physics
- 5) Fritzof Capra, The Wave of life□ VN Jha (Eng. Trans.), Tarkasangraha of Annam Bhatta, International Chinmay□ Foundation, Velliarnad, Arnakulam Yoga Sutra of Patanjali, Ramakrishna Mission, Kolkata
- 6) GN Jha (Eng. Trans.), Ed. RN Jha, Yoga-darshanam with Vyasa Bhashya,
- 7) VidyanidhiPrakashan, Delhi RN Jha, Science of Consciousness Psychotherapyand Yoga

Practices, Vidyavidhi

8) Prakashan, Delhi P B Sharma (English translation), ShodhashangHridayan

9) Pedagogy: Problem based learning, group discussions, collaborative mini projects. Outcome:
Ability to understand, connect up and explain basics of Indian traditional knowledge in modern scientific perspective.

Signature of Teacher

Approved by HOD/Dean

Approved by IQAC Director/Dean Academics



NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (JULY-DEC 2025)

Name of Teacher: DHEERAJ SHARMA

Semester: 7th

Branch: ME

Date of Start: 23/07/2025 Total Load: 42 hrs

Designation: Assistant Professor

Subject Name: AMFT

Subject Code: PCC-ME-701/21

Date of Completion: 21/11/2025

Module/Unit-1: Introduction to Automation

S.No	Name of Topic	Hours
1	Introduction to Automation: Automation in Production System	2
2	Principles and Strategies of Automation, Basic Elements of an Automated System, Advanced Automation Functions	2
3	Levels of Automations, introduction to automation productivity.	2
	Total	(6)

Module/Unit 2-Introduction to Industry 4.0 and its components

S.No	Name of Topic	Hours
1	Introduction to Industry 4.0 and its components: features, working, advantages and applications,	3
2	Programmable logic controllers and its working and programming IoT, its basic components and its role in automation.	3
	Total	6

Module/Unit-3: Overview of Material Handling Systems

S.No	Name of Topic	Hours
1	Overview of Material Handling Systems: Rotary feeders, oscillating force feeder, vibratory feeder, elevator type and Centrifugal type feeders	3
2	Principles and Design Consideration, Material Transport Systems, Storage Systems.	3
	Total	6

Module/Unit 4-.Automated Manufacturing devices

S.No	Name of Topic	Hours
1	Automated Manufacturing devices: Components, Classification and Overview of pneumatic and hydraulic systems	3
2	Actuators, Valves and Electric Control devices.	3
	Total	6

Module/Unit 5-.Automated Manufacturing devices

S.No	Name of Topic	Hours
1	Automated Manufacturing devices: Components, Classification and Overview of pneumatic and hydraulic systems	3
2	Actuators, Valves and Electric Control devices.	2
	Total	5

Module/Unit 6-.Sensors and Controllers

S.No	Name of Topic	Hours
1	Sensors and Controllers: Industrial Control Systems, Process Industries Verses Discrete - Manufacturing, Industries Continuous Verses Discrete Control,	3
2	Computer Control Process and its Forms.	2
3	Sensors Actuators and other Control System Components.	2
	Total	7

Module/Unit 7-.Artificial intelligence and applications

S.No	Name of Topic	Hours
1	Artificial intelligence and applications: Introduction, Need for Machine Learning, Tools and Applications of AI in mechanical engineering, Comparison analysis of results using AI, robots and application of AI in robotics. Case studies on use of AI using research papers.(6)	3
2	robots and application of AI in robotics. Case studies on use of AI using research papers.	3
	Total	6

TEXT BOOKS:

Recommended/ Reference Books:

1. Mikell

P. Groover, Automation, Production Systems, and Computer - integrated

Manufacturing, prentice Hall

2. SeropeKalpakjian and Steven R. Schmid, Manufacturing Engineering and Technology, Pearson

3. Mechatronics by W. Bolton

4. Hydraulics and Pneumatics by Jagdeesha T, I.K. International Publishing House Pvt Ltd.

Web Links :

1. www.youtube.com
2. www.nptel.com

Signature of Teacher

Approved by HOD/Dean

Approved by IQAC Director/Dean Academics



NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (May-Dec 2025)

Name of Teacher: NITIN KUMAR

Designation-ASSISTANT PROFESSOR

Subject Name: Operation Research

Branch: ME

Semester: 7th

Subject code: PCCME-702/21

Date of Start: 23/7/25

Total Load: 42 hrs

Date of Completion: 21/11/25

Module/Unit-1: Introduction.....

S.No	Name of Topic	Hours
1	Definition, role of operations research in decision-making, applications in industry	2
2	Concept on O.R. model building –Types & methods	2
	Total	4

Module/Unit 2-Programming (LP)

S.No	Name of Topic	Hours
1	Programming definition, formulation, solution- graphical, simplex	2
2	BIG-Mmethods, Duality, PRIMAL-DUAL relations-its solution, shadow price, economic interpretation	4
3	dual-simplex, post-optimality & sensitivity analysis, problems	2

	Total	8

Module/Unit 3 -Deterministic Model:

S.No	Name of Topic	Hours
1	Transportation model-balanced & unbalanced, north west rule	2
2	Vogel' sMethod, least cost or matrix minimal, Stepping stone method, MODI methods, degeneracy	4
3	assignment, travelling salesman, problems	2
	Total	8

Module/Unit 4 -Waiting Line Models

S.No	Name of Topic	Hours
1	Introduction, queue parameters, M/M/1 queue, performance of queuing system	4
2	applications in industries, problems	2
	Total	6

Module/Unit 5 -Project Line Models

S.No	Name of Topic	Hours
1	Network diagram, event, activity, defects in network, PERT & CPM	2
2	variance and probability of completion time, project cost- direct, indirect, total,	4
3	Introduction to crashing of network & resources leveling in project, problems	2
	Total	8

Module/Unit 6 - Simulation and Decision Theory

S.No	Name of Topic	Hours
1	Theory: Introduction, design of simulation, models & experiments, model validation, process generation, time flow mechanism,	2
2	Monte Carlo methods- its applications in industries, Decision process, SIMON model, types of decision making environment	4
3	certainty, risk, uncertainty, decision making with utilities, problems	2
	Total	8

TEXT BOOKS:

1. Operations Research – J.K. Sharma, Trinity Press

REFERENCE BOOKS:

- 1.Operations Research – Hamdy A. Taha, Pearson Education.
2. Quantitative Techniques in Management – N.D. Vohra, TMH, New Delhi
3. Operations Research – J.K. Sharma, Trinity Press

Signature of Teacher

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NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (JULY-DEC 2025)

Name of Teacher: KARAN PAL SINGH

Designation: ASSISTANT PROFESSOR

Subject Name: AUTOMOBILE ENGINEERING

Branch: ME

Semester: 7th

Subject Code: PEC-ME-723/21

Date of Start: 23/07/2025 Total Load: 36 hrs

Date of Completion: 21/11/2025

Module/Unit-1: Introduction to Automobile Engineering

S.No	Name of Topic	Hours
1	Types of automobile vehicles, vehicle construction and layouts, Vehicle frame and body	2
2	vehicle aerodynamics, Requirements of Automobile Body; Unitised Body, Car Body Styles, Bus Body & Commercial	1
3	Vehicle Body Types; Front Engine Rear Drive & Front Engine Front Drive Vehicles, Four Wheel Drive Vehicles, Safety considerations; Safety features of latest vehicle; Future trends in Automobiles, Introduction to Hybrid and Electric Vehicle.	3
	Total	6

Module/Unit-2: Power Transmission and Axle

S.No	Name of Topic	Hours
1	Requirements of transmission system	1
2	Clutches and their types,	2
3	Different types of Gear Boxes- Sliding Mesh, Constant Mesh, Synchro- mesh Gear Boxes, epicyclic gear box, continuous variable transmission (CVT)	3
	Total	6

Module/Unit-3: Drive lines and Axle

S.No	Name of Topic	Hours
1	Universal Joint, Differential and Drive Axles: Effect of driving thrust and torque reactions	2
2	Hotchkiss Drive, Torque Tube Drive and radius Rods; Propeller Shaft, Universal Joints, Slip Joint; Constant Velocity Universal Joints	2
3	Front Wheel Drive; Principle, Function, Construction & Operation of	2

	Differential; Rear Axles, Types of load coming on Rear Axles, Full Floating, Three quarter Floating and Semi Floating Rear Axles.	
	Total	6

Module/Unit 4: Suspension System

S.No	Name of Topic	Hours
1	Terms related to suspension system, Need of Suspension System, Types of Suspension-double-wishbone	2
2	Mac Pherson strut and solid axle suspension; factors influencing ride comfort	2
3	Suspension Spring; Constructional details and characteristics of leaf springs.	2
	Total	6

Module/Unit-5: Steering System

S.No	Name of Topic	Hours
1	Front Wheel geometry & Wheel alignment viz. Caster, Camber, King pin Inclination, Toe-in/Toe-out	2
2	Conditions for true rolling motions of Wheels during steering; Different types of Steering Gear Boxes	2
3	Steering linkages and layout; Power steering – Rack & Pinion Power Steering Gear, Electronics steering	2
	Total	6

Module/Unit 6: Automotive Brakes, Tyres & Wheels

S.No	Name of Topic	Hours
1	Classification of Brakes; Principle and constructional details of Drum Brakes, Disc Brakes;	2
2	Brake actuating systems; Mechanical, Hydraulic, Pneumatic Brakes; Factors affecting Brake performance, Power & Power Assisted Brakes, ABS	2
3	Tyres of Wheels; Types of Tyre & their constructional details, Wheel Balancing, Tyre Rotation; Types of Tyre wear & their causes.	2
	Total	6

Recommended/ Reference Books:

1. T K Garrett, Motor vehicle, 13th ed., Elsevier.
2. Crouse and Anglin Automotive Mechanics, 10th edition Tata McGraw Hill, New Delhi.
3. Heitner J., Automotive Mechanics, 2nd ed., East-West Press, 1999.
4. Heisler H., Advanced Engine Technology, SAE International Publ., USA, 1998.

Web Links:

S.No.	Address of web source	Content
1.	1 http://www.nptel.ac.in	Unit 1, Unit 2

Signature of Teacher

Approved by HOD/Dean

Approved by IQAC Director/Dean Academics



NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (JULY-DEC 2025)

Name of Teacher: KARAN PAL SINGH

Designation: ASSISTANT PROFESSOR

Subject Name: POWER PLANT ENGINEERING

Branch: ME

Semester: 7th

Subject Code: PEC-ME-744/21

Date of Start: 23/07/2025

Total Load: 40 hrs

Date of Completion: 21/11/2025

Module/Unit-1: Introduction to Power Plant Engineering

S.No	Name of Topic	Hours
1	Different types of power plants, Thermodynamics related to power plants	1
2	Different types of fuels related to power plants, Availability based tariff (ABT)	1
3	Boiler safety act, comparative study of different types of power plants	2
	Total	4

Module/Unit-2: Coal Based Power Plants

S.No	Name of Topic	Hours
1	Coal based thermal power plants, basic Rankine cycle and its modifications	2
2	Layout of modern coal powerplant, super critical boilers,	1
3	FBC boilers, Pinch point analysis, Wilson line, subsystems of coal based power plants	2
4	Steam turbines, condensers, steam and heating rates, fuel and ash handling, electro-static precipitator	2
5	Draught system, feed water treatment, binary cycles and cogeneration systems.	1
	Total	8

Module/Unit-3: Gas turbine and Combined Cycle Power Plants

S.No	Name of Topic	Hours
1	Gas turbine based combined cycle power plants	1
2	Brayton cycle analysis and optimization, components of gas turbine power	2

	plants,	
3	Heat Recovery Steam Generator (HRSG)	1
4	Coal gasification, Integrated Gasifier based Combined Cycle (IGCC) systems	2
	Total	6

Module/Unit 4: Nuclear Power Plant:

S.No	Name of Topic	Hours
1	Basics of nuclear energy conversion, Layout and subsystems of nuclear power plants, Boiling Water Reactor (BWR),	2
2	Pressurized Water Reactor (PWR), CANDU Reactor, Pressurized Heavy Water Reactor (PHWR), Fast Breeder Reactors (FBR)	2
3	Gas cooled and liquid metal cooled reactors, safety measures for nuclear power plants	2
	Total	6

Module/Unit-5: Renewable Energy

S.No	Name of Topic	Hours
1	Hydroelectric power plants, classification, typical layout and components,	2
2	Principles of wind, tidal, solar PV and solar thermal, geothermal	3
3	Biogas and fuel cell power systems	1
	Total	6

Module/Unit 6:Power Plant Analysis

S.No	Name of Topic	Hours
1	Energy, economic and environmental issues, power tariffs	1
2	Load distribution parameters, load curve, capital and operating cost of different power plants	3
3	Pollution control technologies including waste disposal options for coal and nuclear plants.	2
4		
5		
6		
	Total	6

Recommended/ Reference Books:

1. Nag P.K., Power Plant Engineering, Tata McGraw Hill.
2. El Wakil M.M., Power Plant Technology, Tata McGraw Hill.

Web Links:

S.No.	Address of web source	Content
1.	https://archive.nptel.ac.in/courses/112/107/112107291/#	Energy Scenario and Basic Concepts
2.	https://archive.nptel.ac.in/courses/112/107/112107291/#	Ash Handling, Feed Water Treatment
3.	https://archive.nptel.ac.in/courses/112/107/112107291/#	Steam Turbines, Gas Turbines
4.	https://archive.nptel.ac.in/courses/112/107/112107291/#	Nuclear Energy and Nuclear Power Plant
5.	https://archive.nptel.ac.in/courses/112/107/112107291/#	Wind Energy, Solar Thermal Power
6.	https://archive.nptel.ac.in/courses/112/107/112107291/#	Economic of Power Generation and Environmental Aspects of power generation

Signature of Teacher

Approved by HOD/Dean

Approved by IQAC Director/Dean Academics



NGF COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN (May-Dec 2025)

Name of Teacher: NITIN KUMAR

Designation-ASSISTANT PROFESSOR

Subject Name: ACOUSTICS AND VIBRATIONS

Branch: ME

Semester: 7

Subject cod: PCC-ME706/21

Date of Start: 23/7/25

Total Load: .44....hrs

Date of Completion: 21/11/25

Module/Unit-1: .Introduction.....

S.No	Name of Topic	Hours
1	Harmonic motion, periodic motion, vibration terminology, Single Degree of freedom System	3
2	Free and forced vibrations with and without damping, magnification factor, transmissibility	3
	Total	6

Module/Unit 2-Two degree of Freedom Systems

S.No	Name of Topic	Hours
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1	Generalized co-ordinates, principal co-ordinates derivation of equation of motion, co-ordinate coupling, Lagrange's equation	3
2	Vibration Absorber: Tuned absorber determination of mass ratio, tuned and damped absorber (qualitative treatment only), untuned viscous damper	4
	Total	7

Module/Unit 3 -Multi Degree of Freedom system

S.No	Name of Topic	Hours
1	Derivation of equation, calculation of natural frequencies by Rayleigh, Stodola method	3
	matrix, matrix iteration and Holzer methods	3
	Total	6

Module/Unit 4 -Vibration Analysis

S.No	Name of Topic	Hours
1	Introduction, Influence coefficient, Stiffness Matrix, Flexibility Matrix	4
2	Natural Frequencies and Normal Modes	2
	Total	6

Module/Unit 5 -Automotive Noise Control:

S.No	Name of Topic	Hours
1	Noise Characteristics of engines, Assessment of mechanical noise	3
2	Transmission noise. Control Techniques: Noise levels, Static and Dynamic Balancing,	2
3	Methods of controlling noise in engines Control Techniques	1
	Total	6

Module/Unit 6 -Basics of Acoustics

S.No	Name of Topic	Hours
1	Introduction, frequency, acoustical sources, Properties of elementary acoustical sources: Point source (monopole), line source, loudness, decibel scale, octave, music scale	3
2	Acoustic measures: SPL, rms, Leq, levels, Complex notation of harmonic signals. Freq. domain: Spectra, 1/3-octave and octave bands, A-,B-, and C-weighting.	4
	Total	7

Module/Unit 7 - Physical phenomena influencing sound propagation

S.No	Name of Topic	Hours
1	Damping, reflection, scattering, diffraction refraction. Snell's	4

	law, Vehicle acoustics in general and development trends	
2	Silencers, Road traffic noise and city planning	2
	Total	6

TEXT BOOKS:

1. Mechanical Vibration – V.P.Singh, Dhanpat Rai & Sons

REFERENCE BOOKS:

Mechanical Vibration – V.P.Singh, Dhanpat Rai & Sons.

2. Mechanical Vibration :G.K.Grover – Nem Chand & Bros., Roorkee, INDIA

3. Fundamentals of Acoustics, Lawrence E. Kinsler, Austin R. Frey, Wiley Publishers

Signature of Teacher

Approved by HOD/Dean

Approved by IQAC Director/Dean Academics



NGF COLLEGE OF ENGINEERING & TECHNOLOGY

Department of Mechanical Engineering

LESSON PLAN (July-Dec 2025)

Name of Teacher: Ritu Dagar

Designation: Assistant Professor/COE Coordinator

Subject Name: Human Resource Management

Branch: Department of Mechanical Engineering

Semester: 7th

Subject Code: OEC-ME-444

Date of Start: 23/07/ 2025

Total Load: 18 lectures (15 hrs)

Date of Completion: 21/11/2025

Module/Unit-1: Human Resource Management

S.No	Name of Topic	Hours
1	concept, evolution and scope;	50 minutes
2	Roles, responsibilities and competencies of HR manager;	50 minutes
3	Challenges to HR professionals;	50 minutes
4	Human Resource Planning & Forecasting: significance and process;	50 minutes
5	Revision	50 minutes
	Total	4 Hours, 10 minutes

Module/Unit- 2: HR Sourcing

S.No	Name of Topic	Hours
1	Recruitment, Selection and Induction	50 minutes
2	Job Analysis: job Description and job Specification;	50 minutes
3	Job Design: approaches and methods;	50 minutes
4	Job Evaluation-concept & methods;	50 minutes
5	Performance appraisal and counselling.	50 minutes
	Total	4 Hours, 10 minutes

Module/Unit- 3: Training process, training need analysis (TNA)

S.No	Name of Topic	Hours
1	Training methods and techniques;	50 minutes
2	Career planning and Development;	50 minutes
3	Succession planning;	50 minutes
4	Employee Compensation: basic concepts & determinants;	50 minutes
	Total	3 Hours, 20 minutes

Module/Unit-4: Industrial Relations and Grievance Handling

S.No	Name of Topic	Hours
1	Employee welfare; Dispute Resolution;	50 minutes
2	International Human Resource Management;	50 minutes
3	Contemporary Issues in HRM: knowledge Management, HR Audit & Accounting, HR in virtual organizations, ethics & corporate social responsibility	50 minutes
4	Revision	50 minutes
	Total	3 Hours, 20 minutes

TEXT BOOKS / REFERENCE BOOKS:

TEXT/REFERENCE BOOKS

1. K. Aswathapa, "Human resource Management: Text and cases", 6th edition, Tata McGraw Hill, New Delhi.
2. Uday Kumar Halder & Juthika Sarkar, "Human resource Management", New Delhi Oxford University Press
3. De Cenzo, Da & Robbins S.P, "Fundamentals of Human Resource Management" 9th edition, New York, John Wiley & Sons
4. Gary Dessler, "Human Resource Management", 11th edition New Delhi: Pearson Prentice Hall.
5. Tanuja Agarwala, "Strategic Human resource Management", Oxford University Press



Signature of Teacher

Ritu Dagar

Approved by HOD/Dean



Approved by IQAC Director/Dean Academics