

**Advanced institute of Technology&Management, Palwal****Subject Details and Lecture Plan  
(Teacher's copy)**

Subject Title: <b>BASIC ELECTRONICS</b>	Subject Code: <b>ESC-201</b>	
Total Contact Hours: L + T + P = 50 + 0 + 0	Duration of Exam: 03 Hrs.	
Total Internal Assessment Marks: 25	End Semester Exam. Marks: 75	Total Marks = 100

**Pre-requisites:** Basic fundamentals of BASICS ELECTRONICS.

**Outcomes:**The Student will learn the

1. Understandtheprinciplesofsemiconductordevicesandtheir applications.
2. Designanapplication usingOperational amplifier.
3. Understandthe workingoftiming circuits andoscillators.
4. Understandlogicgates,flipflopasabuildingblockofdigitalsystems.

**Reference Books:**

1. Floyd,"ElectronicDevices"PearsonEducation9thedition,2012.
2. R.P.Jain,"Modern DigitalElectronics",Tata Mc Graw Hill,3rdEdition, 2007.
3. Frenzel, "Communication Electronics: Principles and Applications",Tata McGraw Hill, 3rd Edition, 2001

**STUDENT ASSESSMENT:**

There will be two tests of 90 minutes duration of 24 marks each. The average of best two will be considered as Final Internal Assessment marks. There will not be any further test. However, the concerned faculty member's decision is final as regards assignment of Internal Assessment is concerned.

**Assessment Plan:**

Internal Theory Marks Distribution			
Mid-Term Test	Attendance	Assignment	Total
10 marks	10 marks	5 marks	25 marks

### *Mid-Term Exams*

Mid-term Exams	Examination Date
1 <sup>st</sup> Mid-term Exams	24-9-2025 to 26-9-2025
2 <sup>nd</sup> Mid-term Exams	17-11-2025 to 19-11-2025

### **FINAL EXAMINATION:**

There will be one final examination of 3 hours duration at the end of the semester conducted by YMCA containing questions from the whole syllabus.

**Scheme of End Semester Examination:** Max. Marks: 75

Date: Faculty Member  
(Sign.& Name)

HOD  
(Signature & Name)

### Lecture Plan

**N.B. TWO AUDIO-VISUAL PRESENTATIONS PER WEEK.**

Lecture No.	Unit / Chapter No.	Topic	Scheduled Date	Actual Date	Remarks & sign. of HOD	Teaching Aids
1.	<b>Unit1:</b> <b>Semiconductor Devices and Applications</b>	Introduction to P-N junction Diode and V-I characteristics	14/7/2025			
2.		Half wave rectifiers	15/7/2025			
3.		Full-wave rectifiers	16/7/2025			
4.		capacitor filter	17/7/2025			PPT
5.		Zener diode and its characteristics	18/7/2025			
6		Zener diode as voltage regulator	21/7/2025			

7.		Regulated power supply IC based on 78XX and 79XX series	22/7/2025			
8		Regulated power supply IC based on 78XX and 79XX series	23/7/2025			
9		Introduction to BJT	28/7/2025			
10		Introduction to BJT, its input-output and transfer characteristics	29/7/2025			PPT
11		Introduction to BJT, its input-output and transfer characteristics	30/7/2025			
12		BJT as a single stage CE amplifier	30/7/2025			
13		frequency response and bandwidth	31/7/2025			
14		frequency response and bandwidth	1/8/2025			
15	<b>Unit2: Operationalamplifieranditsap plications</b>	Introductiontooperationalamplifier s	4/8/2025			
16		Op-ampinput modes and parameters	5/8/2025			
17		Op-ampinput modes and parameters	6/8/2025			
18		Op-amp in open loop configuration	7/8/2025			
19		Op-amp in open loop configuration	8/8/2025			
20		op-amp with negative feedback	11/8/2025			
21		study of practical op-amp IC 741	12/8/2025			
22		inverting and non-inverting amplifier applications	13/8/2025			PPT
23		inverting and non-inverting amplifier applications	14/8/2025			
24		summing amplifier	18/8/2025			
25	difference amplifier	19/8/2025				
26	unity gain buffer	20/8/2025				
27	comparator	21/8/2025				
28	integrator	22/8/2025				
29	differentiator	25/8/2025				

30	<b>Unit 3: Timing Circuits and Oscillators</b>	RC-timing circuits	26/8/2025				
31		IC 555 and its applications as monostable	27/8/2025				
32		positive feedback	<b>28/8/2025</b>				
33		Barkhausen's criteria for oscillation	29/8/2025				
34		Barkhausen's criteria for oscillation	1/9/2025			PPT	
35		R-C phase shift	2/9/2025				
36		Weinbridge oscillator.	3/9/2025				
37	<b>Unit4: Digital Electronics Fundamentals</b>	Difference between analog and digital signals	4/9/2025				
38		Boolean algebra	5/9/2025				
39		Basic and Universal Gates, Symbols, Truth tables	8/9/2025			PPT	
40		logic expressions, Logic simplification using K- map	9/9/2025				
41		logic expressions, Logic simplification using K- map	10/9/2025				
42		logic expressions, Logic simplification using K- map	11/9/2025				
43		half and full adder	12/9/2025			PPT	
44		half and full subtractor	15/9/2025				
45		multiplexers, de- multiplexers	16/9/2025				
46		flip-flops	17/9/2025			PPT	
47		shift registers	18/9/2025				
48		counters	19/9/2025				
49			Block diagram of microprocessor				
50			Block diagram of microcontroller	23/9/2025			
51	<b>Unit5: Electronic</b>	The elements of communication system	29/9/2025				

	Communicatio n Systems				
52		IEEE frequency spectrum	30/9/2025		PPT
53		Transmission media: wired and wireless	3/10/2025		
54		need of modulation of AM	6/10/2025		
55		FM modulation schemes	8/10/2025		
56		Mobile communication systems	9/10/2025		PPT
57		cellular concept and block diagram of GSM system.	13/10/2025		PPT
58		cellular concept and block diagram of GSM system.	14/10/2025		
59		Questions of K map	15/10/2025		
60		Questions of K map	16/10/2025		
61		FM modulation schemes	27/10/2025		
62		Weinbridge oscillator.	28/10/2025		
63		different modeling styles in VHDL	29/10/2025		
64		Codes for sequential circuits	30/10/2025		
66		different modeling styles in VHDL	31/10/2025		
67		different modeling styles in VHDL	3/11/2025		
68		REVISION	4/11/2025		
69		REVISION	6/11/2025		
70		REVISION	7/11/2025		
71		REVISION	10/11/2025		
72		CLASS TEST	11/11/2025		
73		CLASS TEST	12/11/2025		
74		CLASS TEST	13/11/2025		

75		CLASS TEST	14/11/2025			
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### Syllabus Coverage Report

Syllabus coverage before MST-1	Satisfactory/ Lagging by ____ lectures.
Syllabus coverage before MST-2	
Syllabus coverage before MST-3	
HoD Remarks	

### General Comments of the Class Teacher about the suitability of Lecture Plan

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Signature of Teacher & Date

Signature of HOD & Date

# Advanced institute of Technology & Management, Palwal

## Subject Details and Lecture Plan (Teacher's copy)

Subject Title: <b>Engineering Mechanics</b>	Subject Code: ESC-203-R	
Total Contact Hours: L + T + P = 50 + 0 + 0	Duration of Exam: 03 Hrs	
Total Internal Assessment Marks: 25	End Semester Exam. Marks: 75	Total Marks = 100

### STUDENT ASSESSMENT:

There will be two tests of 90 minutes duration of 24 marks each. The average of best two will be considered as Final Internal Assessment marks. There will not be any further test. However, the concerned faculty member's decision is final as regards assignment of Internal Assessment is concerned.

### Assessment Plan:

Internal Theory Marks Distribution			
Mid-Term Test	Attendance	Assignment	Total
10 marks	10 marks	5 marks	25 marks

### Mid-Term Exams

Mid-term Exams	Examination Date
1 <sup>st</sup> Mid-term Exams	13-10-2025 to 16-10-2025
2 <sup>nd</sup> Mid-term Exams	17-11-2025 to 19-11-2025

### FINAL EXAMINATION:

There will be one final examination of 3 hours duration at the end of the semester conducted by YMCA containing questions from the whole syllabus.

**Scheme of End Semester Examination:** Max. Marks: 75

Date:

Faculty Member  
(Sign.& Name)

HOD  
(Signature & Name)

### LESSON PLAN

Lecture No.	Unit / Chapter No.	Topic	Scheduled Date	Teaching Aids
1.	<b>Unit-I</b>	Introduction to Mechanics, Method of sections, Zero-force member	26/8/2025	

2.		Fundamental Principles, Coplanar forces,	27/8/2025	
3.		Equilibrium of particles, Free body diagram	02/09/2025	
4.		Equilibrium of particle in space, Single equivalent force	03/09/2025	PPT
5.		Equilibrium of rigid bodies in two dimensions	05/9/2025	
6.		Analysis of plane trusses, Method of joints	09/9/2025	
7.	<b>Unit-2:</b>	Characteristics of dry friction,	10/9/2025	
8.		Problems involving dry friction	12/09/2025	
9.		Ladder, Wedges, Square threaded screws	15/9/2025	
10.		System of connected rigid bodies, Degrees of freedom	16/9/2025	
11.		Conservative forces, Potential energy,	18/9/2025	
12.		Potential energy criteria for equilibrium.	19/9/2025	PPT
13.	<b>Unit-3</b>	Centroid, Mass moment of inertia	23/9/2025	
14.		First moment of area, Theorems of Pappus and Guldinus	24/09/2025	PPT
15.		Second moment of area, Moment and Product of inertia of plane areas	25/09/2025	PPT
16.		Transfer Theorems, Polar moment of inertia, Principal axes	26/09/2025	Field
17.		Problem Practice unit-1	30/09/2025	Offline
18.		Problem Practice unit-2	01/10/2025	
19.		Problem Practice unit-3	03/10/2025	
20.		Definition of virtual work, Principle of virtual work	06/10/2025	PPT
21.		Moment of Inertia	08/10/2025	
22.		Revision for Mid term	09/10/2025	PPT
23.		Midterm Exam	13/10/2025-16/10/2025	Mid Term
24.	<b>Unit-4</b>	Position, Velocity and Acceleration, Tangential	17/10/2025	
25.		Rectilinear motion, Curvilinear motion of a particle,	24/10/2025	
26.		Normal components, Radial and Transverse components	27/10/2025	
27.		Rotation of rigid bodies about a fixed	27/10/2025	PPT
28.	<b>UNIT-V</b>	General plane motion, D'Alembert's principle of work and energy	28/10/2025	

29.		Absolute and relative motion method	29/8/2025	
30.		Instantaneous centre of rotation in plane motion	30/10/2025	PPT
31.		Linear momentum, Equation of motion	31/10/2025	
32.		Angular momentum of a particle and rigid body in plane motion	3/11/2025	
33.		Particle rigid body in plane motion,	4/11/2025	
34.	<b>UNIT-VI</b>	Conservation of energy for a particle, System of rigid bodies,	6/11/2025	
35.		Principle of impulse and momentum	7/11/2025	PPT
36.		Rigid bodies in plane motion	11/11/2025	
37.		Impact, direct and central impact, coefficient of restitution	12/11/2025	
38.		Conservation of momentum	13/11/2025	
39.		Revision	14/11/2025	

**Remarks:**

Sign of Faculty

Doc No.....

Review No.....

Date.....

**Advanced institute of Technology&Management, Palwal****Subject Details and Lecture Plan  
(Teacher's copy)**

<b>Subject Title:</b> FLUIDMECHANICSANDFLUIDMACHINES	Subject Code: <b>PCC-ME-303/21</b>	
Total Contact Hours: L + T + P = 50 + 0 + 0	Duration of Exam: 03 Hrs.	
Total Internal Assessment Marks: 25	End Semester Exam. Marks: 75	Total Marks = 100

**Pre-requisites:** Basic fundamentals of FLUID MECHANICS.**Outcomes:**The Student will learn the**CO1-**Explain the properties of fluid and basic fluid mechanics laws.**CO2-**Understand the characteristics of fluid and application of continuity and Bernoulli's equation.**CO3-**Conceptualize the boundary layer, laminar and turbulent flow.**CO 4-** Analyze the modeling of fluid flow problems.**CO5-**Evaluate the performance of hydraulic turbines.**CO6-**Evaluate the performance of hydraulic pumps**Reference Books:**

Mechanics of Fluids – I H Shames; McGraw

Fluid Mechanics and Fluid Power Engineering – D.S. Kumar; S.K. Kataria and Sons.

Introduction to Fluid Mechanics and Fluid Machines – S.K. Som and G. Biswas; TMH Publications, New Delhi

**STUDENT ASSESSMENT:**

There will be two tests of 90 minutes duration of 24 marks each. The average of best two will be considered as Final Internal Assessment marks. There will not be any further test. However, the concerned faculty member's decision is final as regards assignment of Internal Assessment is concerned.

**Assessment Plan:**

Internal Theory Marks Distribution

Mid-Term Test	Attendance	Assignment	Total
10 marks	10 marks	5 marks	25 marks

### ***Mid-Term Exams***

Mid-term Exams	Examination Date
1 <sup>st</sup> Mid-term Exams	24-9-2025 to 26-9-2025
2 <sup>nd</sup> Mid-term Exams	17-11-2025 to 19-11-2025

### ***FINAL EXAMINATION:***

There will be one final examination of 3 hours duration at the end of the semester conducted by YMCA containing questions from the whole syllabus.

***Scheme of End Semester Examination:*** Max. Marks: 75

Date:

Faculty Member  
(Sign. & Name)

HOD  
(Signature & Name)

### **Lecture Plan**

**N.B. TWO AUDIO-VISUAL PRESENTATIONS PER WEEK.**

Lecture No.	Unit / Chapter No.	Topic	Scheduled Date	Actual Date	Remarks & sign. of HOD	Teaching Aids
1.	<b>UNIT I Introduction and Fluid Statics</b>	Definition of fluid	14/7/2025			
2.		Newton's law of viscosity	15/7/2025			
3.		properties of fluids	16/7/2025			
4.		mass density	17/7/2025			PPT
5.		specific volume	18/7/2025			
6.		specific gravity	21/7/2025			
7.		viscosity	22/7/2025			

8		surface tension	23/7/2025			
9		Stability of floating Bodies	28/7/2025			
10		Submergedbodies	29/7/2025			PPT
11		Determinationofmetacentricheight	30/7/2025			
12		NumericalProblems	30/7/2025			
13		NumericalProblems	31/7/2025			
14	<b>UNIT 2 Fluid Kinematics and Fluid Dynamics</b>	Different types of flows	1/8/2025			
15		Continuity equation	4/8/2025			
16		applications of continuity equation	5/8/2025			
17		momentum equation	6/8/2025			
18		momentum equation&applications	7/8/2025			
19		Euler's equation	8/8/2025			
20		Bernoulli's equationanditsapplications	11/8/2025			
21		Bernoulli's equationanditsapplications	12/8/2025			
22		Venturi meter	13/8/2025			PPT
23		,Venturimeter	14/8/2025			
24		Orificemete	18/8/2025			
25		Rotameter	19/8/2025			
26		NumericalProblems	20/8/2025			
27		NumericalProblems	21/8/2025			
28	<b>Unit 3 Laminar flow through pipes and Boundary Layer</b>	Exact flow solutions in channels	22/8/2025			

29		Exact flow solutions in ducts	25/8/2025			
30		Couette	26/8/2025			
31		Poiseuille flow	27/8/2025			
<b>32</b>		laminar flow through circular conduits	<b>28/8/2025</b>			
33		concept of boundary layer	29/8/2025			
34		measurement of boundary layer thickness	1/9/2025			PPT
35		Von-Karman integral Momentum equation for boundary layer	2/9/2025			
36		Darcy Weisbach equation	3/9/2025			
37		friction factor	4/9/2025			
38		Numerical Problems	5/9/2025			
39		Numerical Problems	8/9/2025			PPT
40	<b>UNIT 3 Dimensional Analysis</b>	Need for dimensional analysis	9/9/2025			
41		methods of dimension analysis	10/9/2025			
42		Similitude, types of similitude	11/9/2025			
43		Dimensionless parameters, application of dimensionless	12/9/2025			PPT
44		similitude laws	15/9/2025			
45		Model testing of turbines and pumps	16/9/2025			
46		Numerical Problems	17/9/2025			PPT
47	<b>UNIT 5 Hydraulic Turbines</b>	Euler's equation	18/9/2025			
48		theory of Rotodynamic machines, Introduction to hydro power plant	19/9/2025			
49		Pelton turbine, Francis turbine				
50		Kaplan turbines and their working principles,	23/9/2025			
51	<b>Unit6: Pumps</b>	Centrifugal pumps: working principle, various heads and efficiencies	29/9/2025			
52		velocity triangles, work done by the impeller	30/9/2025			PPT

53		Reciprocating pump	3/10/2025			
54		Indicator Diagram	6/10/2025			
55		velocity components at entry and exit of the rotor	8/10/2025			
56		velocity components at entry and exit of the rotor	9/10/2025			PPT
57		Numerical Problems	13/10/2025			PPT
58		Numerical Problems	14/10/2025			
59		working principle, various heads and efficiencies	15/10/2025			
60		working principle, various heads and efficiencies	16/10/2025			
61		Numerical Problems	3/11/2025			
62		Numerical Problems	4/11/2025			
63		Revision and class test	7/11/2025 to 14/11/2025			

### Syllabus Coverage Report

Syllabus coverage before MST-1	Satisfactory/ Lagging by ____ lectures.
Syllabus coverage before MST-2	
Syllabus coverage before MST-3	
HoD Remarks	

### General Comments of the Class Teacher about the suitability of Lecture Plan

Signature of Teacher & Date

Signature of HOD & Date



**Advanced institute of Technology&Management,Palwal****Subject Details and Lecture Plan  
(Teacher's copy)**

Subject Title: <b>MATHEMATICS III</b>	Subject Code: <b>BSC-201</b>	
Total Contact Hours: L + T + P = 50 + 0 + 0	Duration of Exam: 03 Hrs	
Total Internal Assessment Marks: 25	End Semester Exam. Marks: 75	Total Marks = 100

**Pre-requisites:** Basic fundamentals of Mathematics.

**Outcomes:** The student will learn the

At the end of this course, students will demonstrate the ability to

- Solve field problems in engineering involving PDEs
- Formulate and solve problems involving random variables
- Apply statistical methods for analysing experimental data.
- Understand the concept of probability.

**Materials and Resources Required: .**

**Reference Books:**

1. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons.
2. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications.
3. P.G. Hoel, S.C. Port and C.J. Stone, Introduction to Probability Theory, Universal Book Stall.
4. S. Ross, A First Course in Probability, Pearson Education India.

**STUDENT ASSESSMENT:**

There will be two tests of 90 minutes duration of 24 marks each. The average of best two will be considered as Final Internal Assessment marks. There will not be any further test. However, the concerned faculty member's decision is final as regards assignment of Internal Assessment is concerned.

**Assessment Plan:**

Internal Theory Marks Distribution
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Mid-Term Test	Attendance	Assignment	Total
10 marks	10 marks	5 marks	25 marks

### *Mid-Term Exams*

Mid-term Exams	Examination Date
1 <sup>st</sup> Mid-term Exams	24-9-2025 to 26-9-2025
2 <sup>nd</sup> Mid-term Exams	17-11-2025 to 19-11-2025

### **FINAL EXAMINATION:**

There will be one final examination of 3 hours duration at the end of the semester conducted by YMCA containing questions from the whole syllabus.

***Scheme of End Semester Examination:*** Max. Marks: 75

Date: Faculty Member  
(Sign. & Name)

HOD  
(Signature & Name)

### Lecture Plan

**N.B. TWO AUDIO-VISUAL PRESENTATIONS PER WEEK.**

Lecture No.	Unit / Chapter No.	Topic	Scheduled Date	Actual Date	Remarks & sign. of HOD	Teaching Aids
1.	Definition of Partial Differential Equations	Definition of Partial Differential Equations	14/7/2025			
2.		First order partial differential equations	15/7/2025			
3.		solutions of first order linear PDEs	16/7/2025			
4.		Solution to homogenous	17/7/2025			PPT
5.		Solution to non-homogenous	18/7/2025			
6.		Solution to non-homogenous linear partial differential equations	21/7/2025			
7.		second order by complimentary function	22/7/2025			
8.		particular integral method	23/7/2025			

9		Second-order linear equations	28/7/2025			
10		Second-order linear equations and their classification	29/7/2025			PPT
11		Second-order linear equations and their classification	30/7/2025			
12		Problems	30/7/2025			
13		Problems	31/7/2025			
14		Initial and boundary conditions	1/8/2025			
15		Initial and boundary conditions	4/8/2025			
16		Problems	5/8/2025			
17		D'Alembert's solution of the wave equation	6/8/2025			
18		D'Alembert's solution of the wave equation	7/8/2025			
19		Duhamel's principle for one dimensional wave equation	8/8/2025			
20		Duhamel's principle for one dimensional wave equation	11/8/2025			
21		Problems	12/8/2025			
22		Heat diffusion and vibration problems	13/8/2025			PPT
23		Heat diffusion and vibration problems	14/8/2025			
24		Problems	18/8/2025			
25		Separation of variables method to simple problems in Cartesian coordinates	19/8/2025			
26		Separation of variables method to simple problems in Cartesian coordinates	20/8/2025			
27		Problems	21/8/2025			
28		The Laplacian in plane	22/8/2025			
29		cylindrical polar coordinates	25/8/2025			
30		spherical polar coordinates	26/8/2025			
31		Problems	27/8/2025			

32		Besselfunctionsand Legendrefunctions	28/8/2025			
33		Besselfunctionsand Legendrefunctions	29/8/2025			
34		Onedimensionaldiffusionequation	1/9/2025			PPT
35		Onedimensionaldiffusionequationanditssolutionbyseparationofvariables	2/9/2025			
36		Onedimensionaldiffusionequationanditssolutionbyseparationofvariables	3/9/2025			
37		Problems	4/9/2025			
38		Problems	5/9/2025			
39	<b>Unit2</b>	Probabilityspaces	8/9/2025			PPT
40		conditionalprobability	9/9/2025			
41		Independence,Discreterandomvariables	10/9/2025			
42		Independence,Discreterandomvariables	11/9/2025			
43		Independent random variables	12/9/2025			PPT
44		themultinomialdistribution,	15/9/2025			
45		Poissonapproximationtothebinomial distribution	16/9/2025			
46		Poissonapproximationtothebinomial distribution	17/9/2025			PPT
47		infinitesequencesofBernoullitrials	18/9/2025			
48		infinitesequencesofBernoullitrials	19/9/2025			
49		sumsofindependentrandomvariables	19/9/2025			
50		Moments, Variance of a sum	23/9/2025			
51		Correlation coefficient	29/9/2025			
52		Chebyshev's Inequality	30/9/2025			PPT
53		Continuousrandomvariables andtheirproperties	3/10/2025			
54		Continuousrandomvariablesandtheirproperties	6/10/2025			
55		distributionfunctionsanddensities	8/10/2025			

56		Normal exponential	9/10/2025			PPT
57		gamma densities	13/10/2025			PPT
58		Bivariate distributions	14/10/2025			
59		Bivariate distributions and their properties	15/10/2025			
60		distribution of sums and quotients	16/10/2025			
61		, conditional densities, Bayes' rule	27/10/2025			
62	<b>Unit 3</b>	Basic Statistics	28/10/2025			
63		, Measures of Central tendency: Moments, skewness	29/10/2025			
64		Probability distributions: Binomial, Poisson	30/10/2025			
65		Normal - evaluation of statistical parameters for these three distributions	31/10/2025			
66		, Correlation and regression – Rank correlation	3/11/2025			
67		Curve fitting by the method of least squares- fitting of straight lines	4/11/2025			
68		second degree parabolas and more general curves	6/11/2025			
69		Large sample test for single proportion	7/11/2025			
70		, difference of proportions, Tests for single mean	10/11/2025			
71		difference of means, and difference of standard deviations	11/11/2025			
72		Chi- square test for goodness of fit	12/11/2025			
73		Class test	13/11/2025			
74		Class test	14/11/2025			

## Syllabus Coverage Report

Syllabus coverage before MST-1	Satisfactory/ Lagging by ____ lectures.
Syllabus coverage before MST-2	
Syllabus coverage before MST-3	
HoD Remarks	

## General Comments of the Class Teacher about the suitability of Lecture Plan

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Signature of Teacher & Date

Signature of HOD & Date

**Advanced institute of Technology&Management, Palwal****Subject Details and Lecture Plan  
(Teacher's copy)**

<b>Subject Title: STRENGTH OF MATERIALS-I</b>	Subject Code: <b>PCC-ME-302/21</b>	
Total Contact Hours: L + T + P = 50 + 0 + 0	Duration of Exam: 03 Hrs.	
Total Internal Assessment Marks: 25	End Semester Exam. Marks: 75	Total Marks = 100

**Pre-requisites:** Basic fundamentals of SOM.

**Outcomes:** The Student will learn the

**CO1-**Analyze the static stresses and strains within the elementary structural.

**CO2-**Evaluate shear force, bending moment and their distribution under transverse loading.

**CO3-**Understand the basic terminology and concepts for slope and deflection of beams.

**CO4-**Determine the stresses and strains in the members subjected to axial, bending and torsion loads.

**CO5-**Apply the concept of stresses in pressure vessels

**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.
3. Ferdinand P. Beer, Russell Johnson Jr and John J. Dewole, Mechanics of Materials, Tata McGraw Hill Pu

**STUDENT ASSESSMENT:**

There will be two tests of 90 minutes duration of 24 marks each. The average of best two will be considered as Final Internal Assessment marks. There will not be any further test. However, the concerned faculty member's decision is final as regards assignment of Internal Assessment is concerned.

**Assessment Plan:**

Internal Theory Marks Distribution			
Mid-Term Test	Attendance	Assignment	Total
10 marks	10 marks	5 marks	25 marks

### ***Mid-Term Exams***

Mid-term Exams	Examination Date
1 <sup>st</sup> Mid-term Exams	24-9-2025 to 26-9-2025
2 <sup>nd</sup> Mid-term Exams	17-11-2025 to 19-11-2025

### ***FINAL EXAMINATION:***

There will be one final examination of 3 hours duration at the end of the semester conducted by YMCA containing questions from the whole syllabus.

***Scheme of End Semester Examination:*** Max. Marks: 75

Date: Faculty Member  
(Sign.& Name)

HOD  
(Signature & Name)

### **Lecture Plan**

**N.B. TWO AUDIO-VISUAL PRESENTATIONS PER WEEK.**

Lecture No.	Unit / Chapter No.	Topic	Scheduled Date	Actual Date	Remarks & sign. of HOD	Teaching Aids
1.	<b>UNIT Stress, Strain and Deformation of Solids</b>	Rigid bodies	14/7/2025			
2.		deformable solids	15/7/2025			
3.		Tension	16/7/2025			
4.		Compression	17/7/2025			PPT
5.		Shear Stresses	18/7/2025			
6		Hooke's law, Elastic constants	21/7/2025			

7.		Elastic constants and their relations	22/7/2025			
8		Plastic behavior of materials	23/7/2025			
9		Deformation of simple and compound bars	28/7/2025			
10		Thermal stresses	29/7/2025			PPT
11		compound bars, Thermal stresses	30/7/2025			
12		Volumetric strains, Stresses on inclined planes	30/7/2025			
13		principal stresses and principal planes	31/7/2025			
14		Mohr's circle of stress. Numerical Problems	1/8/2025			
15	<b>Unit 2 Transverse Loading on Beams and Stresses in Beams</b>	Types of beams, Transverse loading, Shear force and bending moment in beams, Cantilevers, Simply supported beams and overhanging beams under point, uniformly distributed and uniformly varying loads, Theory of bending of beams, bending stress distribution and neutral axis, shear stress distribution, Load carrying capacity, Proportioning of section	4/8/2025			
16		Transverse loading, Shear force	5/8/2025			
17		bending moment in beams	6/8/2025			
18		bending stress distribution and neutral axis	7/8/2025			
19		shear stress distribution, Load carrying capacity	8/8/2025			
20		Proportioning of section & numericals	11/8/2025			
21	<b>Unit 3 Deflection of Beams</b>	Double Integration method	12/8/2025			
22		Macaulay's method	13/8/2025			PPT
23		Area moment method for computation of slopes	14/8/2025			

24		deflections in beams	18/8/2025			
25		Conjugate beam and strain energy	19/8/2025			
26		Castigliano's & Maxwell's theorems	20/8/2025			
27		NUMERICALS	21/8/2025			
28	<b>Unit 4 Torsion</b>	<b>Torsion:</b> Torsion formulation stresses	22/8/2025			
29		deformation in circular and hollow shafts	25/8/2025			
30		Stepped shafts	26/8/2025			
31		Deflection in shafts fixed at the both ends	27/8/2025			
32		Stresses in helical springs	<b>28/8/2025</b>			
33		Deflection of helical springs	29/8/2025			
34		carriage springs	1/9/2025			PPT
35		NUMERICALS	2/9/2025			
36	<b>UNIT 5 Thin Cylinders, Spheres and Thick Cylinders</b>	Stresses in thin cylindrical shell due to internal pressure, circumferential and longitudinal stresses and deformation in thin and thick cylinders, spherical shell subjected to internal pressure, Deformation in spherical shells, Lamé's theorem	3/9/2025			
37		Stresses in thin cylindrical shell due to internal pressure	4/9/2025			
38		circumferential	5/9/2025			
39		and longitudinal stresses	8/9/2025			PPT
40	<b>UNIT 3 Dimensional Analysis</b>	deformation in thin cylinders	9/9/2025			
41		deformation in thick cylinders	10/9/2025			
42		spherical shell subjected to internal pressure	11/9/2025			
43		spherical shell subjected to internal pressure	12/9/2025			PPT
44		numericals	15/9/2025			

45		numericals	16/9/2025			
46		Deformation in spherical shells, Lamé's theorem	17/9/2025			PPT
47		Lamé's theorem	18/9/2025			
48		Lamé's theorem	19/9/2025			
50		numericals	23/9/2025			
51			30/9/2025 to 14/11/2025			

### Syllabus Coverage Report

Syllabus coverage before MST-1	Satisfactory/ Lagging by ____ lectures.
Syllabus coverage before MST-2	
Syllabus coverage before MST-3	
HoD Remarks	

### General Comments of the Class Teacher about the suitability of Lecture Plan

Signature of Teacher & Date

Signature of HOD & Date

**Advanced institute of Technology&Management, Palwal****Subject Details and Lecture Plan  
(Teacher's copy)**

<b>Subject Title: THERMODYNAMICS</b>		Subject Code: <b>PCC-ME-301/21</b>	
Total Contact Hours: L + T + P = 50 + 0 + 0		Duration of Exam: 03 Hrs.	
Total Internal Assessment Marks: 25		End Semester Exam. Marks: 75	Total Marks = 100
Lesson Plan Author: Mr Ravi Kumar	Signature:	Date: 14/7/2025	
Checked by: Mr. Dharmender	Signature:	Date:	

**Pre-requisites:** Basic fundamentals of SOM.

**Outcomes:** The Student will learn the

At the completion of this course the student will be able to:

**CO1-**

Understand the basic concepts of thermodynamics and apply energy balance to systems and control volumes, in situations involving heat and work interactions.

**CO2-** Learn to differentiate between high grade and low grade energies and understand the Second law limitations on energy conversion.

**CO3-** Evaluate properties of pure substances, gases and their mixtures in various processes.

**CO4-** Analyze performance of energy conversion devices and cycles.

**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.

## STUDENT ASSESSMENT:

There will be two tests of 90 minutes duration of 24 marks each. The average of best two will be considered as Final Internal Assessment marks. There will not be any further test. However, the concerned faculty member's decision is final as regards assignment of Internal Assessment is concerned.

### Assessment Plan:

Internal Theory Marks Distribution			
Mid-Term Test	Attendance	Assignment	Total
10 marks	10 marks	5 marks	25 marks

### Mid-Term Exams

Mid-term Exams	Examination Date
1 <sup>st</sup> Mid-term Exams	24-9-2025 to 26-9-2025
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### FINAL EXAMINATION:

There will be one final examination of 3 hours duration at the end of the semester conducted by YMCA containing questions from the whole syllabus.

**Scheme of End Semester Examination:** Max. Marks: 75

Date: Faculty Member  
(Sign.& Name)

HOD  
(Signature & Name)

## Lecture Plan

**N.B. TWO AUDIO-VISUAL PRESENTATIONS PER WEEK.**

Lecture No.	Unit / Chapter No.	Topic	Scheduled Date	Actual Date	Remarks & sign. of HOD	Teaching Aids
1.	UNIT 1 Fundamental Concepts	Introduction, System & Control volume	14/7/2025			

2.		Types of systems, Property, State & Process; Concept of Thermodynamic Equilibrium, Quasistatic Process, Exact & Inexact differentials; 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	15/7/2025			
3.		Property, State & Process	16/7/2025			
4.		Concept of Thermodynamic Equilibrium	17/7/2025			PPT
5.		Quasistatic Process, Exact & Inexact differentials	18/7/2025			
6.		Work - Thermodynamic definition of work	21/7/2025			
7.		Displacement work	22/7/2025			
8.		Path dependence of displacement work	23/7/2025			
9.		Definition of heat; examples of heat/ work interaction in system	28/7/2025			
10.		Numerical Problems related to Heat and Work	29/7/2025			PPT
11.	<b>UNIT 2 Temperature and First law</b>	Temperature, Definition of thermal equilibrium and Zeroth law; Temperature scales; Various Thermometers. First Law for Cyclic & Non-cyclic processes; Concept of total energy E; Energy: a property; Various modes of energy, Internal energy and Enthalpy. Numerical Problems on Thermometry and First Law	30/7/2025			
12.		Definition of thermal equilibrium	30/7/2025			
13.		Zeroth law, Temperature scales	31/7/2025			
14.		Various Thermometers. First Law for Cyclic & Non-cyclic processes	1/8/2025			
15.		Concept of total energy E; Energy: a property	4/8/2025			
16.		Various modes of energy, Internal energy and Enthalpy	5/8/2025			
17.		Numerical Problems on Thermometry and First Law	6/8/2025			

18	<b>UNIT 3 First Law for Flow Processes</b>	Definitions of direct and reverse heat engines	7/8/2025			
19		Definitions of thermal efficiency and COP	8/8/2025			
20		Kelvin-Planck and Clausius statements	11/8/2025			
21		Clausius statements and their equivalence	12/8/2025			
22		Definition of reversible process	13/8/2025			PPT
23		Internal and external irreversibility	14/8/2025			
24		Carnot cycle; Carnot theorem, ;Absolute temperature scale	18/8/2025			
25		Clausius inequality; Definition of entropy S	19/8/2025			
26		Entropy S: a property; Principle of entropy	20/8/2025			
27		entropy and its applications	21/8/2025			
28		Illustration of processes in T-s coordinates	22/8/2025			
29		Irreversibility and Availability, Availability function for systems	25/8/2025			
30		and Control volumes undergoing different processes	26/8/2025			
31		Numerical Problems on Second law and Entropy	27/8/2025			
32	<b>Unit 5 Properties of Pure Substances and Gas Mixtures</b>	Definition of Pure substance, Ideal Gases and ideal gas mixtures, Real gases, Properties of two phase systems- Constant temperature and Constant pressure heating of water; 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	<b>28/8/2025</b>			
33		Ideal Gases and ideal gas mixtures	29/8/2025			
34		Real gases, Properties of two phase systems	1/9/2025			PPT
35		Properties of two phase systems	2/9/2025			

36		-Constant temperature and Constant pressure heating of water	3/9/2025				
37		Definitions of saturated states; P-v-T surface	4/9/2025				
38		Use of steam tables and Mollier's chart	5/9/2025				
39		Identification of states & determination of properties	8/9/2025			PPT	
40		NUMERICALS	9/9/2025				
41	<b>Unit 6 Thermodynamic Cycles</b>	Air Standard Otto, Diesel and Dual cycles; their comparison; Basic Brayton cycle. Numerical Problems	10/9/2025				
42		Diesel	11/9/2025				
43		Dual cycles	12/9/2025			PPT	
44		Diesel and Dual cycles; their comparison	15/9/2025				
45		Basic Brayton cycle	16/9/2025				
46		Basic Brayton cycle	17/9/2025			PPT	
47		Numerical Problems	18/9/2025				
48		Numerical Problems	19/9/2025				
49			CLASS TEST & REVISION	30/9/2025 to 14/11/2025			

### Syllabus Coverage Report

Syllabus coverage before MST-1	Satisfactory/ Lagging by ____ lectures.
Syllabus coverage before MST-2	
Syllabus coverage before MST-3	
HoD Remarks	

**General Comments of the Class Teacher about the suitability of Lecture Plan**

Signature of Teacher & Date

Signature of HOD & Date