

**MAHATMA GANDHI MISSIONS  
COLLEGE OF ENGINEERING, NANDED.  
FOUNDATION COURSE FOR ENGINEERING ASPIRANTS  
SUBJECT: BEEE**

**Course Objective**

1. To expose the undergraduate first-year engineering students to the fundamental laws of electricity & electronics & their applications in day-to-day life.
2. To lay a course foundation for the students who would be trained in the related core subjects like electrical, electronics etc.

**Course outcomes**

1. Learner should understand & grasp the analytical treatment of electrical quantities with the help of phasor-algebra.
2. To understand difference between DC & AC systems & between single-phase and it's utility.
3. To understand equivalent circuits of physical electrical system & gadgets.
4. To understanding functioning of electronic circuit with common topologies consisting of the semiconductors devices such as diode & transistors, useful in domestic & industrial power supplies.

LECTURE NO.	TOPIC TO BE COVERED
	<b>01 :- Work, power &amp; energy</b>
1	Work, Energy and Power, Work done by a constant force and by a variable force, SI-units mass, force, weight, work, power, energy [kilowatt-hour (kwh)].
2	Work Energy Theorem. Notions of potential energy, conservation of mechanical energy, Different forms of energy.
	<b>02: -Modern electron theory</b>
3	Structure of an Atom, Electrostatics-charges & their conservation, unit of charge, dielectric constant, electric field, electric potential
4	Gauss's theorem & its applications, conductors & insulators, capacitance (parallel plate),
5	Dielectric material & its effect on capacitance, capacitances in series & parallel, energy of a capacitors.
	<b>03 :-Current electricity</b>
6	Introduction (flow of current), sources of e.m.f.,

7	Electric current, resistance of different materials, temperature dependence, thermistor, specific resistivity, color code for carbon resistors
8	Ohm's law and its limitation. Superconductors (elementary ideas). Kirchoff's laws, resistances in series and parallel.
	<b>04 :- Magnetism</b>
9	Bar magnet (comparison with a solenoid), magnetic lines of force, torque on a bar magnet in a magnetic field.
10	Para, dia and ferromagnetic substances with examples (simple idea), Electromagnets and permanent magnets.
	<b>05:- EMI &amp; alternating currents.</b>
11	Faraday's Law of electromagnetic induction, Lenz's Law, induced emf, self and mutual inductance. Alternating current, and voltage, impedance and reactance.
12	A.C. circuits containing inductance, capacitance and resistance; phase relationships, and power in a.c. circuits.
13	Electrical machines and devices (transformer, generator, simple motors) eddy current.
	<b>06 :-Solids &amp; Semiconductor devices</b>
14	Conductors, Insulators, Semiconductors using energy band theory. Intrinsic semiconductors,
15	Extrinsic semiconductor, P-N junction, semiconductor diode, photo diode, LED, Zener diode as a voltage regulator, diode as rectifier, junction transistor.
16	<b>07:- Introduction to digital circuit-conversions, combination of logic gates.</b>
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**Foundation Course for Engineering Aspirants**

**SUBJECT: ENGINEERING MECHANICS**

**A) COURSE OBJECTIVES:**

- To make the students to know the importance of this subject in the field of Engineering particularly Civil & Mechanical Engineering.
- To make them learn the fundamentals of Mechanics, equation of static equilibrium & dynamic equilibrium of particles and rigid bodies.
- To learn the effect of friction on equilibrium.
- To learn kinematics, kinetics of particle and rigid body, related principles.
- To implement the above know how to solve practical problems.

**B) COURSE OUTCOME:**

- At the end of this course, student must be in a position to analysis and solve the practical problems of statics and dynamics.
- After learning the subject, students are made ready to take up the subjects like TOM, SOM, Design of machine elements, DOS, TOS etc.

## **TOPIC I: a) System of coplanar forces,**

### **b) Centre of gravity and Moment of inertia.**

Lecture 1: Engineering mechanics, introduction to the subject, scope of the subject in the field of engineering, scalars and vectors, force, system of forces.

Lecture 2: Composition and resolution of forces.

Lecture 3: Moment of a force, couple, Varignon's principle of moments, applications.

Lecture 4: Centre of gravity and moment of inertia, applications.

## **TOPIC II: Equilibrium force system**

Lecture 5: equilibrium force system- definition, Concept of Free Body Diagram (FBD), Equations of static equilibrium.

Lecture 6: Applications of Equations of static equilibrium to concurrent and non concurrent force systems.

Lecture 7: Beams and their support reactions.

Lecture 8: Plane trusses and their analysis.

## **TOPIC III: FRICTION**

Lecture 9: Phenomenon of friction, coefficient of friction ( $\mu$ ), angle of friction, angle of repose, laws of dry friction.

Lecture 10: Applications of friction to ladder and wedge block.

Lecture 11: Belt and rope friction.

## **TOPIC III: Dynamics, (kinematics and kinetics)**

Lecture 12: kinematics of a particle, rectilinear motion and its types, motion curves.

Lecture 13: Curvilinear motion, projectile motion.

Lecture 14: Kinematics of a particle, Newton's laws of motion, D'alambert's principle, and work energy principle.

**MGM's College of Engineering, Nanded.**  
**Orientation Course on Fundamentals of Computer Programming**

**Course Objectives: -**

- To understand computer hardware and computer application.
- To understand basic terminologies used in computer programming.
- To understand problem solving by using structural programming.
- To understand different features of C programming.

**Course Outcomes: -**

At the end of course students will be able to

- Use basic terminologies required to write C program.
- Knows concept of problem solving.
- Use different input/output methods.
- Solve the problem using C programming.

**Course Contents: -**

- Introduction to Computer
- Applications of Computer in real life
- Generations of Computer-From Mainframe to Smartphone
- Hardware and Software
- Operating system
- Algorithm and flowchart
- Types of programming language
- Applications of programming languages in real life
- Introduction to C language
- Tokens and Character set
- Constants and variables
- Data types and keywords
- Operators in C and its types
- Expressions in C
- Standard input- output statements in C
- Structure of C-program.
- Overview of decision making statements
- Overview of arrays, strings and functions

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FOUNDATION COURSE FOR ENGINEERING ASPIRANTS**

**SUBJECT: ENGINEERING MATHEMATICS**

**OBJECTIVES:**

1. To expose the undergraduate first-year engineering students to the fundamental laws of mathematics.
2. To develop the use of trigonometry, matrix algebra techniques this is needed by engineers for practical applications.
3. To familiarize the student with functions of several variables, differentiation & integration .This is needed in many branches of engineering.
4. To introduce the concepts of vectors differetational & integral calculus, which are needed in engineering applications?

**COURSE OUTCOMES:**

1. Learner should understand the basic principle of mathematics & use their applications in day-to-day life.
2. To understand concept of differentiation & integration in applied sense.
3. To understanding the role of trigonometry & vectors in different branches in engineering.

<b>LECTURE NO</b>	<b>TOPIC TO BE COVERED</b>
	<b>1. Trigonometry</b>
<b>1</b>	Introduction to trigonometry. Compound angle formulae,
<b>2</b>	Changing products of sines and cosines into sums or differences. Changing sums or differences of sines and cosines into products
	<b>2. Cartesian and polar co-ordinates</b>
<b>3</b>	Introduction, Changing from Cartesian into polar co-ordinates ,Changing from polar into Cartesian co-ordinates, Use of $R \rightarrow P$ and $P \rightarrow R$
	<b>3. Complex Numbers</b>

4	Cartesian complex numbers, The Argand diagram, Addition and subtraction, Multiplication and division of complex numbers.
5	The polar form of a complex number, Multiplication and division in polar form
6	Applications of complex numbers, De Moivre's theorem
	<b>4. Differential Calculus</b>
7	Introduction to differentiation, Methods of differentiation.
8	Successive differentiation, Differentiation of parametric equations
9	Introduction to parametric equations
10	Differentiation of implicit functions
11	Laws of logarithms, Logarithmic differentiation
12	Velocity and acceleration, Practical problems involving maximum and minimum values.
	<b>5. Integral Calculus</b>
13	Standard integration, Integration using trigonometric substitutions,
14	Integration by parts
15	Integration using partial fractions,
16	Definite integrals,
17	Worked problems on the area under a curve
	<b>6. Vectors</b>
18	Introduction, Vector addition, Vector subtraction, Resolution of vectors
19	Applications of vectors.
20	<b>7. The theory of matrices and determinants</b>



# COLLEGE OF ENGINEERING, NANDED

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## Foundation Course for Engineering Aspirants

### SUBJECT: ENGINEERING DRAWING

#### **A) Course Objectives:**

1. Students should know the fundamental principles of geometry and machine drawing.
2. Students should be able to visualize the objects.
3. They should be able to understand and read the drawing and able to present the same.
4. To develop the manual drawing skill.

#### **B) Course Outcomes:**

1. At the end of course students are able to represent 3D objects on a plane paper. They will understand methods of projection i.e orthographic and isometric projections.
2. Students will be able to apply the knowledge of the subject to represent ideas on a paper.

<b>Lect .No.</b>	<b>Topic &amp; its contents planned</b>	<b>Date of Lecture</b>	<b>Remark</b>
1	Necessity of the subject		
2	Introduction to drawing instruments, sheet layout, scaling		
3	Introduction to methods of projection		
4	Study of four quadrants & difference between 1 <sup>st</sup> & 3 <sup>rd</sup> angle method of projection.		
5	Examples on orthographic projection		
6	Examples on orthographic projection		
7	Introduction to isometric projection		
8	Examples on isometric projection		
9	Projections of points in all quadrants & planes		
10	Examples on projections of points.		
11	Introduction to Projections of straight lines.		
12	Line parallel to both the planes. Line parallel to one plane & inclined to other,		
13	Examples on projection of line parallel to one plane and perpendicular to other plane		
14	Examples on projection of line parallel to one plane and inclined to other plane		



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**Congratulations to the students passing their 12th exam  
Looking for Engineering career?  
MGM Engineering College Welcome you,**

We are happy to announce the preparatory orientation course before joining the Engineering Education to get acquainted with the subjects like Engineering Mathematics, Engineering Mechanics, Basic Electrical & Electronics Engineering and Computer Programming. To make your passage of First year Engineering smooth and successful we would like to help you.

3 weeks orientation course from 5th June to 24th June is organized by MGM Engineering College Nanded, free of cost.

- So register yourself on or before 5th June 2017.
- Looking forward to see you on 5th June.
- Course Timing: 9:00 A.M. to 12:30 P.M.
- Venue: MGM's College of Engineering, Near Air Port, Hingoli Road, Nanded .

Dr. Mrs. Geeta Lathkar  
Director

- For Registration - Contact
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