



AICTE ID: 1-3548321

College Code: 231

# R.D. ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated to Dr. APJ Abdul Kalam Technical University, Lucknow  
under the aegis of IQAC

Date: 01/02/2022

## DEPARTMENT OF CIVIL ENGINEERING

### NOTICE

Dear CE VI semester students,

We are excited to announce the commencement of special classes for the preparation of the Graduate Aptitude Test in Engineering (GATE). The GATE exam is a gateway to some of the most prestigious postgraduate programs and job opportunities in the field of engineering.

**Class Details:**

**Commencement Date: 04 Feb 2022**

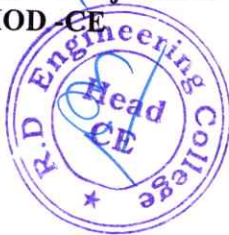
**Venue: C Block Room C 101**

**Why Join GATE Classes at R D Engineering College?**

- 1. In-House Expert Faculty:** Our experienced faculty members, who are well-versed with the GATE examination pattern, will guide you through the entire syllabus.
- 2. College Resources:** Access to library resources, study materials, and state-of-the-art facilities to enhance your learning experience.
- 3. Peer Learning:** Collaborative learning environment, providing you with the opportunity to study and discuss with your peers.

Sincerely,

  
Dr. Pankaj Kumar Singh  
HOD - CE



  
Director  
R.D. Engineering College  
Duhai, Ghaziabad

  
Director  
R.D. Engineering College  
Duhai, Ghaziabad

**CE****Civil Engineering****Section 1: Engineering Mathematics**

Linear Algebra: Matrix algebra; Systems of linear equations; Eigen values and Eigen vectors.

Calculus: Functions of single variable; Limit, continuity and differentiability; Mean value theorems, local maxima and minima, Taylor series; Evaluation of definite and indefinite integrals, application of definite integral to obtain area and volume; Partial derivatives; Total derivative; Gradient, Divergence and Curl, Vector identities; Directional derivatives; Line, Surface and Volume integrals.

Ordinary Differential Equation (ODE): First order (linear and non-linear) equations; higher order linear equations with constant coefficients; Euler-Cauchy equations; initial and boundary value problems.

Partial Differential Equation (PDE): Fourier series; separation of variables; solutions of one-dimensional diffusion equation; first and second order one-dimensional wave equation and two-dimensional Laplace equation.

Probability and Statistics: Sampling theorems; Conditional probability; Descriptive statistics – Mean, median, mode and standard deviation; Random Variables – Discrete and Continuous, Poisson and Normal Distribution; Linear regression.

Numerical Methods: Error analysis. Numerical solutions of linear and non-linear algebraic equations; Newton's and Lagrange polynomials; numerical differentiation; Integration by trapezoidal and Simpson's rule. Single and multi-step methods for first order differential equations.

**Section 2: Structural Engineering**

Engineering Mechanics: System of forces, free-body diagrams, equilibrium equations; Internal forces in structures; Frictions and its applications; Centre of mass; Free Vibrations of undamped SDOF system.

Solid Mechanics. Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; Simple bending theory, flexural and shear stresses, shear centre; Uniform torsion, Transformation of stress; buckling of column, combined and direct bending stresses.

Structural Analysis: Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams, cables and frames; Displacement methods: Slope deflection and moment distribution methods; Influence lines; Stiffness and flexibility methods of structural analysis.

Construction Materials and Management: Construction Materials: Structural Steel – Composition, material properties and behaviour; Concrete - Constituents, mix design, short-term and long-term properties. Construction Management: Types of construction projects; Project planning and network analysis - PERT and CPM; Cost estimation.

Concrete Structures: Working stress and Limit state design concepts; Design of beams, slabs, columns; Bond and development length; Prestressed concrete beams.

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Steel Structures: Working stress and Limit state design concepts; Design of tension and compression members, beams and beam- columns, column bases; Connections - simple and eccentric, beam-column connections, plate girders and trusses; Concept of plastic analysis -beams and frames.

### Section 3: Geotechnical Engineering

Soil Mechanics: Three-phase system and phase relationships, index properties; Unified and Indian standard soil classification system; Permeability - one dimensional flow, Seepage through soils – two - dimensional flow, flow nets, uplift pressure, piping, capillarity, seepage force; Principle of effective stress and quicksand condition; Compaction of soils; One- dimensional consolidation, time rate of consolidation; Shear Strength, Mohr's circle, effective and total shear strength parameters, Stress-Strain characteristics of clays and sand; Stress paths.

Foundation Engineering: Sub-surface investigations - Drilling bore holes, sampling, plate load test, standard penetration and cone penetration tests; Earth pressure theories - Rankine and Coulomb; Stability of slopes – Finite and infinite slopes, Bishop's method; Stress distribution in soils – Boussinesq's theory; Pressure bulbs, Shallow foundations – Terzaghi's and Meyerhoff's bearing capacity theories, effect of water table; Combined footing and raft foundation; Contact pressure; Settlement analysis in sands and clays; Deep foundations – dynamic and static formulae, Axial load capacity of piles in sands and clays, pile load test, pile under lateral loading, pile group efficiency, negative skin friction.

### Section 4: Water Resources Engineering

Fluid Mechanics: Properties of fluids, fluid statics; Continuity, momentum and energy equations and their applications; Potential flow, Laminar and turbulent flow; Flow in pipes, pipe networks; Concept of boundary layer and its growth; Concept of lift and drag.

Hydraulics: Forces on immersed bodies; Flow measurement in channels and pipes; Dimensional analysis and hydraulic similitude; Channel Hydraulics - Energy-depth relationships, specific energy, critical flow, hydraulic jump, uniform flow, gradually varied flow and water surface profiles.

Hydrology: Hydrologic cycle, precipitation, evaporation, evapo-transpiration, watershed, infiltration, unit hydrographs, hydrograph analysis, reservoir capacity, flood estimation and routing, surface run-off models, ground water hydrology - steady state well hydraulics and aquifers; Application of Darcy's Law.

Irrigation: Types of irrigation systems and methods; Crop water requirements - Duty, delta, evapo-transpiration; Gravity Dams and Spillways; Lined and unlined canals, Design of weirs on permeable foundation; cross drainage structures.

### Section 5: Environmental Engineering

  
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Water and Waste Water Quality and Treatment: Basics of water quality standards – Physical, chemical and biological parameters; Water quality index; Unit processes and operations; Water requirement; Water distribution system; Drinking water treatment.

Sewerage system design, quantity of domestic wastewater, primary and secondary treatment. Effluent discharge standards; Sludge disposal; Reuse of treated sewage for different applications.

Air Pollution: Types of pollutants, their sources and impacts, air pollution control, air quality standards, Air quality Index and limits.

Municipal Solid Wastes: Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment and disposal).

## Section 6: Transportation Engineering

Transportation Infrastructure: Geometric design of highways - cross-sectional elements, sight distances, horizontal and vertical alignments.

Geometric design of railway Track – Speed and Cant.

Concept of airport runway length, calculations and corrections; taxiway and exit taxiway design.

Highway Pavements: Highway materials - desirable properties and tests; Desirable properties of bituminous paving mixes; Design factors for flexible and rigid pavements; Design of flexible and rigid pavement using IRC codes

Traffic Engineering: Traffic studies on flow and speed, peak hour factor, accident study, statistical analysis of traffic data; Microscopic and macroscopic parameters of traffic flow, fundamental relationships; Traffic signs; Signal design by Webster's method; Types of intersections; Highway capacity.

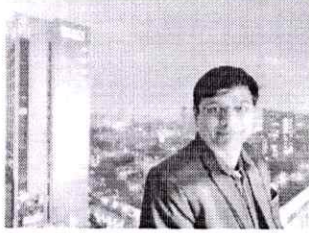
## Section 7: Geomatics Engineering

Principles of surveying; Errors and their adjustment; Maps - scale, coordinate system; Distance and angle measurement - Levelling and trigonometric levelling; Traversing and triangulation survey; Total station; Horizontal and vertical curves.

Photogrammetry and Remote Sensing - Scale, flying height; Basics of remote sensing and GIS.

  
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Dr Pankaj Kumar Singh is PhD in Civil Engineering and M.Tech in the Diversified Engg Stream, He also holds a MBA in Foreign Trade.

Dr Singh is Director Research in R D Engineering College, Ghaziabad.

He also serves as Guest Professor in several countries like Philippines, Qatar etc.

His research area of interest is Environmental Conservation & Sustainability, Biological Waste water treatment, Plant medicine, Crop recognition & monitoring, AI & Modelling and so on.

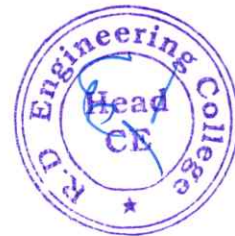
He wrote 5+ books and book chapter in diversified field.

His work is in the field of Patent and till now published more than 30+ national and International Patent and Granted 10+ National and International Patent along with Professors/Researcher of US, Canada, UK, Russia, Syria, Philippines etc as well as Published many Research Papers in reputed journals like MDPI(SCI), ESCI, ABDC Journal , Scopus , Springer, UGC -Care etc.

He also holds session Chair in many International Conferences in different countries like Las Vegas, New Jersey, Bali, Geneva, George Town (Australia).

After all these achievements, Dr Singh was awarded as **\*Best Research Director in the field of Biological Waste water treatment & Plant Medicine\*** and many more awards

  
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SANJAY PALIWAL is a Renowned Professor in the Mechanical Department at R D Engineering College, Ghaziabad, INDIA.

He has done B.E. & M.Tech. and Published Several Research Papers and National and International Patent to his Credit. He has Attended Several National & International Conferences. He has 5 year Industry & 22 year Teaching Experience.



  
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**GATE CLASSES(2021-22), 6TH SEM STUDENTS ATTENDANCE  
CIVIL DEPARTMENT, RDEC GHAZIABAD**

DATE: 4/02/2022

Sr. No.	Student Name	Roll No.	Signature
1	AHMAD HUSSAIN	1902310000001	Ahmed
2	AMANULLAH AHMED	1902310000002	Amanullah
3	ANCHAL	1902310000003	Anchal
4	ANKIT	1902310000004	Ankit
5	ARYAN TYAGI	1902310000005	Aryan Tyagi
6	BOBY	1902310000006	Boby
7	DEEPANSHU VERMA	1902310000007	Absent
8	HIMANSHU	1902310000008	Himanshu
9	IMRAN AHMAD SHEERGOJRI	1902310000009	Imran Ahmad
10	KM VANDANA	1902310000010	Vandana
11	MOHAMMAD SHAHRYAB	1902310000012	MD. Shahryab
12	MUKESH KUMAR	1902310000013	Mukesh
13	MUZAFFAR ALI	1902310000014	Muzaffar
14	SACHIN KUMAR PUNDIR	1902310000016	Sachin Kumar
15	SANGRAM SINGH	1902310000017	Sangram Singh
16	SHIVAM CHAUDHARY	1902310000018	Shivam
17	SHUBHAM TYAGI	1902310000019	Shubham
18	AJAY YADAV	2002310009001	Ajay Yadav
19	AMISHA GUPTA	2002310009002	Amisha Gupta
20	ANANT SHARMA	2002310009003	Anant Sharma
21	ANCHALTIWARI	2002310009004	Anchal Tiwari
22	NITISH BHARDWAJ	2002310009005	Nitish Bhardwaj
23	UTKARSH PARASHAR	2002310009006	Utkarsh Parashar

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**GATE CLASSES(2021-22), 6TH SEM STUDENTS ATTENDANCE  
CIVIL DEPARTMENT, RDEC GHAZIABAD**

DATE: 11/02/2022

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2	AMANULLAH AHMED	1902310000002	Amanullah Ahmed
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5	ARYAN TYAGI	1902310000005	Ankit
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9	IMRAN AHMAD SHEERGOJRI	1902310000009	Imran Ahmad
10	KM VANDANA	1902310000010	Kvandana
11	MOHAMMAD SHAHRYAB	1902310000012	M.M. Shahryab
12	MUKESH KUMAR	1902310000013	Mukesh
13	MUZAFFAR ALI	1902310000014	Muzaffar ali
14	SACHIN KUMAR PUNDIR	1902310000016	Sachin
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16	SHIVAM CHAUDHARY	1902310000018	Shivam
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20	ANANT SHARMA	2002310009003	Anant
21	ANCHALTIWARI	2002310009004	anchal
22	NITISH BHARDWAJ	2002310009005	Nitish
23	UTKARSH PARASHAR	2002310009006	Utkarsh

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**GATE CLASSES(2021-22), 6TH SEM STUDENTS ATTENDANCE  
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DATE: 18/02/2022

Sr. No.	Student Name	Roll No.	Signature
1	AHMAD HUSSAIN	1902310000001	Ahmad
2	AMANULLAH AHMED	1902310000002	Amannullah
3	ANCHAL	1902310000003	Anchal
4	ANKIT	1902310000004	Ankit
5	ARYAN TYAGI	1902310000005	Aryan
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9	IMRAN AHMAD SHEERGOJRI	1902310000009	Imran Ahmed
10	KM VANDANA	1902310000010	Vandana
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22	NITISH BHARDWAJ	2002310009005	Nitish
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**GATE CLASSES(2021-22), 6TH SEM STUDENTS ATTENDANCE  
CIVIL DEPARTMENT, RDEC GHAZIABAD**

DATE: 25/02/2022

Sr. No.	Student Name	Roll No.	Signature
1	AHMAD HUSSAIN	1902310000001	Ahmad
2	AMANULLAH AHMED	1902310000002	Amanullah
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**GATE CLASSES(2021-22), 6TH SEM STUDENTS ATTENDANCE**  
**CIVIL DEPARTMENT, RDEC GHAZIABAD**

DATE: 4/02/2022

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**GATE CLASSES(2021-22), 6TH SEM STUDENTS ATTENDANCE  
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DATE: 25/02/2022

Sr. No.	Student Name	Roll No.	Signature
1	AHMAD HUSSAIN	1902310000001	Ahmad
2	AMANULLAH AHMED	1902310000002	Absent
3	ANCHAL	1902310000003	Anchal
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**GATE CLASSES(2021-22), 6TH SEM STUDENTS ATTENDANCE  
CIVIL DEPARTMENT, RDEC GHAZIABAD**

DATE: 1/04/2022

Sr. No.	Student Name	Roll No.	Signature
1	AHMAD HUSSAIN	1902310000001	Ahmad
2	AMANULLAH AHMED	1902310000002	Amanullah
3	ANCHAL	1902310000003	Anchal
4	ANKIT	1902310000004	Ankit
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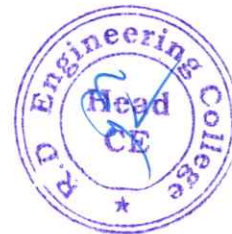


**GATE CLASSES(2021-22), 6TH SEM STUDENTS ATTENDANCE**  
**CIVIL DEPARTMENT, RDEC GHAZIABAD**

DATE: 8/04/2023

Sr. No.	Student Name	Roll No.	Signature
1	AHMAD HUSSAIN	1902310000001	Ahmad
2	AMANULLAH AHMED	1902310000002	Amansullah
3	ANCHAL	1902310000003	Anchal
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22	NITISH BHARDWAJ	2002310009005	Absent
23	UTKARSH PARASHAR	2002310009006	Absent

  
 Director  
 R.D. Engineering College  
 Duhai, Ghaziabad





**GATE CLASSES(2021-22), 6TH SEM STUDENTS ATTENDANCE  
CIVIL DEPARTMENT, RDEC GHAZIABAD**

DATE: 22/04/2022

Sr. No.	Student Name	Roll No.	Signature
1	AHMAD HUSSAIN	1902310000001	Ahmad
2	AMANULLAH AHMED	1902310000002	Amanullah
3	ANCHAL	1902310000003	Anchal
4	ANKIT	1902310000004	Ankit
5	ARYAN TYAGI	1902310000005	Aryan
6	BOBY	1902310000006	Boby
7	DEEPANSHU VERMA	1902310000007	Deepanshu
8	HIMANSHU	1902310000008	Himanshu
9	IMRAN AHMAD SHEERGOJRI	1902310000009	Absent
10	KM VANDANA	1902310000010	Vandana
11	MOHAMMAD SHAHRYAB	1902310000012	M.D. Sharyab
12	MUKESH KUMAR	1902310000013	Absent
13	MUZAFFAR ALI	1902310000014	Muzaffar
14	SACHIN KUMAR PUNDIR	1902310000016	Sachin
15	SANGRAM SINGH	1902310000017	Sangram
16	SHIVAM CHAUDHARY	1902310000018	Shivam
17	SHUBHAM TYAGI	1902310000019	Shubham
18	AJAY YADAV	2002310009001	Ajay
19	AMISHA GUPTA	2002310009002	Absent
20	ANANT SHARMA	2002310009003	Anant
21	ANCHALTIWARI	2002310009004	Anchal
22	NITISH BHARDWAJ	2002310009005	Nitish
23	UTKARSH PARASHAR	2002310009006	Absent

  
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**GATE CLASSES(2021-22), 6TH SEM STUDENTS ATTENDANCE  
CIVIL DEPARTMENT, RDEC GHAZIABAD**

DATE: 29/04/2022

Sr. No.	Student Name	Roll No.	Signature
1	AHMAD HUSSAIN	1902310000001	Ahmad
2	AMANULLAH AHMED	1902310000002	Amanullah
3	ANCHAL	1902310000003	Anchal
4	ANKIT	1902310000004	Ankit
5	ARYAN TYAGI	1902310000005	Absent
6	BOBY	1902310000006	Boby
7	DEEPANSHU VERMA	1902310000007	Deepanshu
8	HIMANSHU	1902310000008	Himanshu
9	IMRAN AHMAD SHEERGOJRI	1902310000009	Imran
10	KM VANDANA	1902310000010	Vandana
11	MOHAMMAD SHAHRYAB	1902310000012	M.D. Shahryab
12	MUKESH KUMAR	1902310000013	Mukesh
13	MUZAFFAR ALI	1902310000014	Muzaffar
14	SACHIN KUMAR PUNDIR	1902310000016	Sachin
15	SANGRAM SINGH	1902310000017	Sangram
16	SHIVAM CHAUDHARY	1902310000018	Shivam
17	SHUBHAM TYAGI	1902310000019	Shubham
18	AJAY YADAV	2002310009001	Ajay
19	AMISHA GUPTA	2002310009002	Absent
20	ANANT SHARMA	2002310009003	Anant
21	ANCHALTIWARI	2002310009004	Anchal
22	NITISH BHARDWAJ	2002310009005	Nitish
23	UTKARSH PARASHAR	2002310009006	Absent

  
 Director  
 R.D. Engineering College  
 Duhai, Ghaziabad





AICTE ID: 1-3548321

College Code: 231

# R.D. ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated to Dr. APJ Abdul Kalam Technical University, Lucknow  
under the aegis of IQAC

Date: 11/09/2021

## DEPARTMENT OF MECHANICAL ENGINEERING

### NOTICE

Dear ME Vth & VIIth semester students,

We are excited to announce the commencement of special classes for the preparation of the Graduate Aptitude Test in Engineering (GATE). The GATE exam is a gateway to some of the most prestigious postgraduate programs and job opportunities in the field of engineering.

**Class Details:**

**Commencement Date: 18 Sep 2021**

**Venue: C Block Room No. C 205**

Sincerely,

Prof. Sanjay Paliwal  
(HOD, ME)



CC:  
Director  
IQAC  
Dean Academics  
Departmental Notice Board

  
Director  
R.D. Engineering College  
Duhai, Ghaziabad



SANJAY PALIWAL is a Renowned Professor in the Mechanical Department at R D Engineering College, Ghaziabad, INDIA.

He has done B.E. & M.Tech. and Published Several Research Papers and National and International Patent to his Credit. He has Attended Several National & International Conferences. He has 5 year Industry & 18 year Teaching Experience.



  
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Duhai, Ghaziabad

### **Section 1: Engineering Mathematics**

Linear Algebra: Matrix algebra, systems of linear equations, eigenvalues and eigenvectors.

Calculus: Functions of single variable, limit, continuity and differentiability, mean value theorems, indeterminate forms; evaluation of definite and improper integrals; double and triple integrals; partial derivatives, total derivative, Taylor series (in one and two variables), maxima and minima, Fourier series; gradient, divergence and curl, vector identities, directional derivatives, line, surface and volume integrals, applications of Gauss, Stokes and Green's theorems.

Differential Equations: First order equations (linear and nonlinear); higher order linear differential equations with constant coefficients; Euler-Cauchy equation; initial and boundary value problems; Laplace transforms; solutions of heat, wave and Laplace's equations.

Complex Variables: Analytic functions; Cauchy-Riemann equations; Cauchy's integral theorem and integral formula; Taylor and Laurent series.

Probability and Statistics: Definitions of probability, sampling theorems, conditional probability; mean, median, mode and standard deviation; random variables, binomial, Poisson and normal distributions.

Numerical Methods: Numerical solutions of linear and non-linear algebraic equations; integration by trapezoidal and Simpson's rules; single and multi-step methods for differential equations.

### **Section 2: Applied Mechanics and Design**

Engineering Mechanics: Free-body diagrams and equilibrium; friction and its applications including rolling friction, belt-pulley, brakes, clutches, screw jack, wedge, vehicles, etc.; trusses and frames; virtual work; kinematics and dynamics of rigid bodies in plane motion; impulse and momentum (linear and angular) and energy formulations; Lagrange's equation.

Mechanics of Materials: Stress and strain, elastic constants, Poisson's ratio; Mohr's circle for plane stress and plane strain; thin cylinders; shear force and bending moment diagrams; bending and shear stresses; concept of shear centre; deflection of beams; torsion of circular shafts; Euler's theory of columns; energy methods; thermal stresses; strain gauges and rosettes; testing of materials with universal testing machine; testing of hardness and impact strength.

Theory of Machines: Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of linkages; cams; gears and gear trains; flywheels and governors; balancing of reciprocating and rotating masses; gyroscope.

Vibrations: Free and forced vibration of single degree of freedom systems, effect of damping; vibration isolation; resonance; critical speeds of shafts.

Machine Design: Design for static and dynamic loading; failure theories; fatigue strength and the S-N diagram; principles of the design of machine elements such as bolted, riveted and welded joints; shafts, gears, rolling and sliding contact bearings, brakes and clutches, springs.



  
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### Section 3: Fluid Mechanics and Thermal Sciences

Fluid Mechanics: Fluid properties; fluid statics, forces on submerged bodies, stability of floating bodies; control-volume analysis of mass, momentum and energy; fluid acceleration; differential equations of continuity and momentum; Bernoulli's equation; dimensional analysis; viscous flow of incompressible fluids, boundary layer, elementary turbulent flow, flow through pipes, head losses in pipes, bends and fittings; basics of compressible fluid flow.

Heat-Transfer: Modes of heat transfer; one dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins; unsteady heat conduction, lumped parameter system, Heisler's charts; thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, heat transfer correlations for flow over flat plates and through pipes, effect of turbulence; heat exchanger performance, LMTD and NTU methods; radiative heat transfer, Stefan-Boltzmann law, Wien's displacement law, black and grey surfaces, view factors, radiation network analysis

Thermodynamics: Thermodynamic systems and processes; properties of pure substances, behavior of ideal and real gases; zeroth and first laws of thermodynamics, calculation of work and heat in various processes; second law of thermodynamics; thermodynamic property charts and tables, availability and irreversibility; thermodynamic relations.

Applications: *Power Engineering*: Air and gas compressors; vapour and gas power cycles, concepts of regeneration and reheat. *I.C. Engines*: Air-standard Otto, Diesel and dual cycles. *Refrigeration and air-conditioning*: Vapour and gas refrigeration and heat pump cycles; properties of moist air, psychrometric chart, basic psychrometric processes. *Turbomachinery*: Impulse and reaction principles, velocity diagrams, Pelton-wheel, Francis and Kaplan turbines; steam and gas turbines.

### Section 4: Materials, Manufacturing and Industrial Engineering

Engineering Materials: Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials.

Casting, Forming and Joining Processes: Different types of castings, design of patterns, moulds and cores; solidification and cooling; riser and gating design. Plastic deformation and yield criteria; fundamentals of hot and cold working processes; load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. Principles of welding, brazing, soldering and adhesive bonding.

Machining and Machine Tool Operations: Mechanics of machining; basic machine tools; single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, jigs and fixtures; abrasive machining processes; NC/CNC machines and CNC programming.

Metrology and Inspection: Limits, fits and tolerances; linear and angular measurements; comparators; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly; concepts of coordinate-measuring machine (CMM).

Computer Integrated Manufacturing: Basic concepts of CAD/CAM and their integration tools; additive manufacturing.



  
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Production Planning and Control: Forecasting models, aggregate production planning, scheduling, materials requirement planning; lean manufacturing.

Inventory Control: Deterministic models; safety stock inventory control systems.

Operations Research: Linear programming, simplex method, transportation, assignment, network flow models, simple queuing models, PERT and CPM.



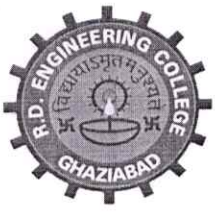
  
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Duhai, Ghaziabad

S.N.	Roll No.	Name	15-09-2018	22-09-2018	29-09-2018	06-10-2018	13-10-2018	20-10-2018	27-10-2018	03-11-2018	10-11-2018	17-11-2018	24-11-2018	31-11-2018
1	1623140007	ABHISHEK RAI	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
2	1623140008	ABHISHEK SINGH	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
3	1623140010	ABHISHEK KUMAR SHARMA	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
4	1623140011	ABHISHEK PAL	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
5	1623140012	ADITYA KUMAR	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
6	1623140013	AKASH	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
7	1623140017	AKASH SINGH	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
8	1623140018	AKASH TYAGI	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
9	1623140019	AMAN	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
10	1623140021	ANIKET SHARMA	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
11	1623140030	ASHISH TOMAR	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
12	1623140032	ASHUTOSH TRIPATHI	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
13	1623140033	ASHWANI KUMAR	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
14	1623140034	ASIF	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
15	1623140035	AVINASH KUMAR	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
16	1623140036	BASANT JHA	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
17	1623140037	DEENANAND	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
18	1623140040	DEEPANSHU TYAGI	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
19	1623140042	GAURAV MUNDE	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
20	1623140043	GAURAV SINGH	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
21	1623140044	GAURAV TYAGI	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
22	1623140045	GOVIND SHARMA	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
23	1623140046	GYANESH SHIVAM	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
24	1623140047	HEMANSHU KUMAR	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
25	1623140048	HIMANSHU KUMAR SHARMA	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
26	1623140049	IRSHANT GIRI	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
27	1623140050	JAGDEEP SINGH	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
28	1623140053	KAJAL	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
29	1623140055	KAVITA DIVEDI	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
30	1623140067	PANKAJ JANOTI	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
31	1623140073	RAHUL SINGH	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
32	1623140077	ROHAN SINGH	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
33	1623140078	ROHIT KUMAR	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
34	1623140079	RUPEESH RAJ	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
35	1623140081	SAHIL	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
36	1623140082	SAHIL CHIKARA	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
37	1623140083	SATYAM CHAURISA	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
38	1623140085	SHEKHAR KUMAR	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
39	1623140086	SHIVAM SHARMA	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
40	1623140087	SHIVANSH KUMAR	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
41	1623140089	SHUBHAM BAGEDVAN	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
42	1623140090	SHUBHAM GAUR	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
43	1623140091	SONAM	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
44	1623140092	SONU KUMAR	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
45	1623140093	SOURABH KUMAR	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
46	1623140096	TARUN CHOUDHARY	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB



Director  
 R.D. Engineering College  
 Duha, Ghaziabad





AICTE ID: 1-3548321

College Code: 231

# R. D. ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated to Dr. APJ Abdul Kalam Technical University, Lucknow  
under the aegis of IQAC

## Department of Electronics and Communication Engineering

Date:09.09.2021

### Notice

**Dear ECE V semester students,**

We are excited to announce the commencement of special classes for the preparation of the Graduate Aptitude Test in Engineering (GATE). The GATE exam is a gateway to some of the most prestigious postgraduate programs and job opportunities in the field of engineering.

**Classes Details:**

**Commencement Date: 17 Sep 2021**

**Venue: C Block Room No. C 201**

Dr. Vishal Upmanu  
(HOD-ECE)



Director  
R.D. Engineering College  
Duhai, Ghaziabad

CC to:

- Director, RDEC
- Coordinator, IQAC
- Dean Academics
- Departmental Notice Board

# R D Engineering College, Ghaziabad

GATE CLASSES for B. Tech (ECE- V Sem) Session 2021-22

## Attendance Sheet

SN	Roll No.	Student's Name	17-09-2021	27-09-2021	07-10-2021	14-10-2021	21-10-2021	28-10-2021	04-11-2022	10-11-2022	17-11-2022	24-11-2022
1	1823131084	TANYA	A	100%	A	A	A	A	A	A	A	A
2	1902310400003	ALAY KUMAR BHARTI	A	A	A	A	A	A	A	A	A	A
3	1902310310001	AAVUSH	A	A	A	A	A	A	A	A	A	A
4	1902310310004	AAKASH KUMAR	A	A	A	A	A	A	A	A	A	A
5	1902310310005	AKASH KUMAR	A	A	A	A	A	A	A	A	A	A
6	1902310310006	AKASH SINGH RATHI	A	A	A	A	A	A	A	A	A	A
7	1902310310009	ANKITA	A	A	A	A	A	A	A	A	A	A
8	1902310310011	AVINASH KUMAR	A	A	A	A	A	A	A	A	A	A
9	1902310310012	DEEPAK	A	A	A	A	A	A	A	A	A	A
10	1902310310013	DEEPANSHU	A	A	A	A	A	A	A	A	A	A
11	1902310310014	DEEPANSHU	A	A	A	A	A	A	A	A	A	A
12	1902310310015	DEEPANSHU TYAGI	A	A	A	A	A	A	A	A	A	A
13	1902310310017	GAURAV KUMAR	A	A	A	A	A	A	A	A	A	A
14	1902310310018	GAURI SHANKAR	A	A	A	A	A	A	A	A	A	A
15	1902310310019	HARSH PORWAL	A	A	A	A	A	A	A	A	A	A
16	1902310310021	HARUN	A	A	A	A	A	A	A	A	A	A
17	1902310310022	HEAMANT SINGH PATEL	A	A	A	A	A	A	A	A	A	A
18	1902310310025	JANVI TYAGI	A	A	A	A	A	A	A	A	A	A
19	1902310310027	KM HEMA	A	A	A	A	A	A	A	A	A	A
20	1902310310029	KM ISHA SHARMA	A	A	A	A	A	A	A	A	A	A
21	1902310310030	MANSVI SANI	A	A	A	A	A	A	A	A	A	A
22	1902310310031	MD ALTAMASH	A	A	A	A	A	A	A	A	A	A
23	1902310310033	MEHUL ARYA	A	A	A	A	A	A	A	A	A	A
24	1902310310034	MOHD NASEEM ANSARI	A	A	A	A	A	A	A	A	A	A
25	1902310310035	MOHD SUHAIL	A	A	A	A	A	A	A	A	A	A
26	1902310310036	Moin Khan	A	A	A	A	A	A	A	A	A	A
27	1902310310037	MUKESH KORI	A	A	A	A	A	A	A	A	A	A
28	1902310310039	NANDITA DODWAL	A	A	A	A	A	A	A	A	A	A
29	1902310310040	NAVIT KUMAR	A	A	A	A	A	A	A	A	A	A
30	1902310310041	NEELAM DIWAKAR	A	A	A	A	A	A	A	A	A	A
31	1902310310042	NIKHIL SINGH	A	A	A	A	A	A	A	A	A	A
32	1902310310043	NIKHIL KUMAR	A	A	A	A	A	A	A	A	A	A
33	1902310310044	PANKAJ SHARMA	A	A	A	A	A	A	A	A	A	A
34	1902310310046	PRADEEP SAGAR	A	A	A	A	A	A	A	A	A	A
35	1902310310047	PRIYANKA SINGH	A	A	A	A	A	A	A	A	A	A
36	1902310310048	PUNIT SAINI	A	A	A	A	A	A	A	A	A	A
37	1902310310052	SAGAR	A	A	A	A	A	A	A	A	A	A
38	1902310310054	SAGAR	A	A	A	A	A	A	A	A	A	A



**Section 1: Engineering Mathematics**

Linear Algebra: Vector space, basis, linear dependence and independence, matrix algebra, eigen values and eigen vectors, rank, solution of linear equations – existence and uniqueness.

Calculus: Mean value theorems, theorems of integral calculus, evaluation of definite and improper integrals, partial derivatives, maxima and minima, multiple integrals, line, surface and volume integrals, Taylor series.

Differential Equations: First order equations (linear and nonlinear), higher order linear differential equations, Cauchy's and Euler's equations, methods of solution using variation of parameters, complementary function and particular integral, partial differential equations, variable separable method, initial and boundary value problems.

Vector Analysis: Vectors in plane and space, vector operations, gradient, divergence and curl, Gauss's, Green's and Stoke's theorems.

Complex Analysis: Analytic functions, Cauchy's integral theorem, Cauchy's integral formula; Taylor's and Laurent's series, residue theorem.

Numerical Methods: Solution of nonlinear equations, single and multi-step methods for differential equations, convergence criteria.

Probability and Statistics: Mean, median, mode and standard deviation; combinatorial probability, probability distribution functions - binomial, Poisson, exponential and normal; Joint and conditional probability; Correlation and regression analysis.

**Section 2: Networks, Signals and Systems**

Network solution methods: nodal and mesh analysis; Network theorems: superposition, Thevenin and Norton's, maximum power transfer; Wye-Delta transformation; Steady state sinusoidal analysis using phasors; Time domain analysis of simple linear circuits; Solution of network equations using Laplace transform; Frequency domain analysis of RLC circuits; Linear 2-port network parameters: driving point and transfer functions; State equations for networks.

Continuous-time signals: Fourier series and Fourier transform representations, sampling theorem and applications; Discrete-time signals: discrete-time Fourier transform (DTFT), DFT, FFT, Z-transform, interpolation of discrete-time signals; LTI systems: definition and properties, causality, stability, impulse response, convolution, poles and zeros, parallel and cascade structure, frequency response, group delay, phase delay, digital filter design techniques.

**Section 3: Electronic Devices**

Energy bands in intrinsic and extrinsic silicon; Carrier transport: diffusion current, drift current, mobility and resistivity; Generation and recombination of carriers; Poisson and continuity equations; P-N junction, Zener diode, BJT, MOS capacitor, MOSFET, LED, photo diode and solar cell; Integrated circuit fabrication process: oxidation, diffusion, ion implantation, photolithography and twin-tub CMOS process.

  
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R.D. Engineering College  
Duhai, Ghaziabad

## Section 4: Analog Circuits

Small signal equivalent circuits of diodes, BJTs and MOSFETs; Simple diode circuits: clipping, clamping and rectifiers; Single-stage BJT and MOSFET amplifiers: biasing, bias stability, mid-frequency small signal analysis and frequency response; BJT and MOSFET amplifiers: multi-stage, differential, feedback, power and operational; Simple op-amp circuits; Active filters; Sinusoidal oscillators: criterion for oscillation, single-transistor and op-amp configurations; Function generators, wave-shaping circuits and 555 timers; Voltage reference circuits; Power supplies: ripple removal and regulation.

## Section 5: Digital Circuits

Number systems; Combinatorial circuits: Boolean algebra, minimization of functions using Boolean identities and Karnaugh map, logic gates and their static CMOS implementations, arithmetic circuits, code converters, multiplexers, decoders and PLAs; Sequential circuits: latches and flip-flops, counters, shift-registers and finite state machines; Data converters: sample and hold circuits, ADCs and DACs; Semiconductor memories: ROM, SRAM, DRAM; 8-bit microprocessor (8085): architecture, programming, memory and I/O interfacing.

## Section 6: Control Systems

Basic control system components; Feedback principle; Transfer function; Block diagram representation; Signal flow graph; Transient and steady-state analysis of LTI systems; Frequency response; Routh-Hurwitz and Nyquist stability criteria; Bode and root-locus plots; Lag, lead and lag-lead compensation; State variable model and solution of state equation of LTI systems.

## Section 7: Communications

Random processes: autocorrelation and power spectral density, properties of white noise, filtering of random signals through LTI systems; Analog communications: amplitude modulation and demodulation, angle modulation and demodulation, spectra of AM and FM, superheterodyne receivers, circuits for analog communications; Information theory: entropy, mutual information and channel capacity theorem; Digital communications: PCM, DPCM, digital modulation schemes, amplitude, phase and frequency shift keying (ASK, PSK, FSK), QAM, MAP and ML decoding, matched filter receiver, calculation of bandwidth, SNR and BER for digital modulation; Fundamentals of error correction, Hamming codes; Timing and frequency synchronization, inter-symbol interference and its mitigation; Basics of TDMA, FDMA and CDMA.

## Section 8: Electromagnetics

Electrostatics; Maxwell's equations: differential and integral forms and their interpretation, boundary conditions, wave equation, Poynting vector; Plane waves and properties: reflection and refraction, polarization, phase and group velocity, propagation through various media, skin depth; Transmission lines: equations, characteristic impedance, impedance matching, impedance transformation, S-parameters, Smith chart; Waveguides: modes, boundary conditions, cut-off frequencies, dispersion relations; Antennas: antenna types, radiation pattern, gain and directivity, return loss, antenna arrays; Basics of radar; Light propagation in optical fibers.