TECHNOCRATS INSTITUTE OF TECHNOLOGY
(An Autonomous Institute Affiliated to RGPV, Bhopal)
DEPARTMENTOF ENGINEERING MATHEMATICS

Semester/Year		I/I	Program		B Tech – CIVIL ENGG.
Subject Category	BSC	Subject Code:	BS-101-CE	Subject Name	Engineering Mathematics Level - I

MaximumMarksAllotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
ES	MS	Assignment/Quiz	ES	LW		L	T	P	
70	20	10	-	-	100	2	1	0	3

Course Objective:

The objective of this course is to familiarize the prospective engineers with techniques in calculus, multivariate analysis and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines. More precisely, the objectives are:

1. To introduce the idea of applying differential and integral calculus to notions of curvature and to improper integrals. Apart from some applications it gives a basic introduction on Beta and Gamma functions.
2. To develop the tool of power series and Fourier series for learning advanced Engineering Mathematics.
3. To acquaint the student with mathematical tools available in statistics needed in variousfield of science and engineering.
4. To develop the essential tool of matrices and linear algebra in a comprehensive manner.

UNITs	Descriptions
1	Unit – I Calculus: Expansion of functions by Mc.Laurin's and Taylor's for one variable; Taylor's theorem for function of two variables, Partial Differentiation, Maxima & Minima (two and three variables), Method of Lagranges Multipliers.
2	Unit – II Calculus: Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolutions. Multiple Integral, Change the order of the integration, Applications of multiple integrals for calculating area and volumes of the curves.
3	Unit – III Fourier series:Fourier series: Periodic functions, Dirichlet's conditions, Fourier series for functions with periods 2pi and 2l, even and odd functions, Half range Fourier sine and cosine series, Parseval's theorem.

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(Dr. Manoj Jain)
Dr. C.K. Verma
(Aftab Baig)
(Bhasha Sharma)

4	Unit – IV Concept of Probability: Probability Mass function, Probability Density Function, Discrete Distribution: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Exponential Distribution.
5	Unit – V Matrices: Rank of a Matrix, Solution of Simultaneous Linear Equations by Elementary Transformation, Consistency of Equation, Eigen Values and Eigen Vectors, Diagonalization of Matrices, Cayley-Hamilton theorem and its applications to find inverse.

Reference Books-

1. Higher Engineering Mathematics, B. S. Grewal, 44th Edition, 2015, Khanna Publishers,ISBN: 978-81-933284-9-1.
2. Calculus, Saturinino L. Salas, Einar Hille and Garret J. Etgen, 10th Edition, 2022, Wiley India,ISBN: 9789390421961.
3. Schaum's Outline of Advanced Calculus, Robert Wrede and Murray Spiegel, 3rd Edition, 2010, McGraw-Hill Education, ISBN -10: 0071623663, ISBN -13: 978-0071623667.
4. Advanced Engineering Mathematics, E. Kreyszig, 10th Edition (Reprint), 2016, John Wiley & Sons,ISBN: 978-0470458365.
5. Calculus, James Stewart, 8th Edition, 2016, Cengage Learning, ISBN: 978-1-285-74062-1.
6. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall, 2003 (Reprint).
7. S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002.
8. W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Ed., Wiley, 1968.

Statistics

List/Linksof e-LearningResource

1. https://nptel.ac.in/courses/111/107/111107112/
2. https://nptel.ac.in/courses/111/104/111104092/
3. https://nptel.ac.in/courses/111/107/111107108/
4. https://nptel.ac.in/courses/111/107/111107108/
5. https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-ma07/

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TECHNOCRATS INSTITUTE OF TECHNOLOGY

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DEPARTMENT OF ENGINEERING MATHEMATICS

Semester/Year		I/I	Program		B.Tech – CSE, IT, AIML, AIDS, AI, DS & CY
Subject Category	BS	Subject Code:	BS-101-CS	Subject Name	Engineering Mathematics Level –I (Probability Theory & Statistics & Linear Algebra)

Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
ES	MS	Assignment / Quiz	ES	LW		L	T	P	
70	20	10				2	1	0	3

Course Objective:

The objective of this course is to familiarize the prospective engineers with techniques incalculus, multivariate analysis and linear algebra. It aims to equip the students with standard concepts andtools at an intermediate to advanced level that will serve them well towards tackling more advanced level ofmathematics and applications that they would find useful in their disciplines. This course also familiarizes the students with probability and statistical techniques.

UNITs	Descriptions
1.	Matrices: Rank of a Matrix, Solution of Simultaneous Linear Equations by Elementary Transformation, Consistency of Equation, Eigen Values and Eigen Vectors, Cayley-Hamilton theorem.
2.	Vector Spaces :Vector Space, Vector Sub Space, Linear Combination ofVectors,Linearly Dependent, Linearly Independent, Basis of a Vector Space,Linear Transformations.
3	Ordinary Differential Equations I: Differential Equations of First Order and First Degree (Leibnitz linear, Bernoulli's, Exact), Higher order differential equations with constants coefficients. II: Second order linear differential equations with variable coefficients.
4.	Basic Probability spaces, conditional probability, independence; Discrete random variables,Independent random variables, the multinomial distribution, Poisson approximation to thebinomial distribution, infinite sequences of Bernoulli trials, Expectation of Discrete Random Variables, Moments, Variance of a sum. Probability distributions: Binomial, Poisson and Normal Distribution.
5.	Basic Statistics Measures of Central tendency: Moments, skewness and Kurtosis, evaluation of statistical parameters for these three distributions, Correlation and regression – Rank correlation. Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves. Test of significance.

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Reference Books-
1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition,Pearson, Reprint, 2002. 2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006. 3. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008. 4. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005. 5. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall, 2003 (Reprint). 6. S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002. 7. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2010. 8. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.

Course Outcomes:
CO 1: To get familiarized with the vector spaces and its transformation. **CO 2:** To introduce the idea of applying differential and integral calculus to notions of curvature and toimproper integrals. Apart from some applications it gives a basic introduction on Beta and Gammafunctions **CO 3:** To getfamiliarized with ordinary higher order differential equations **CO 4:** To able to understand likelihood events and analyse it. **CO 5:** to interpret and analyze various types of data

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TECHNOCRATS INSTITUTE OF TECHNOLOGY

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DEPARTMENTOF ENGG. MATHEMATICS (EC/EX)

Semester/Year		I / I	Program		B.Tech–EC/EX
Subject Category	BS	Subject Code:	BS-101 EC / EX	Subject Name	Engineering Mathematics Level - I

MaximumMarksAllotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
ES	MS	Assignment / Quiz	ES	LW		L	T	P	
70	20	10	-	-	100	2	1	-	3

CourseObjective:
The objective of this course is to familiarize the prospective engineers with techniques in calculus, multivariate analysis and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines. More precisely, the objectives are: ➢ To introduce the idea of applying differential and integral calculus to notions of curvature and to improper integrals. Apart from some applications it gives a basic introduction on Beta and Gamma functions. ➢ To develop the essential tool of matrices and linear algebra in a comprehensive manner. ➢ To acquaint the student with mathematical tools available in vector calculus needed various field of science andengineering.

UNITs	Descriptions
1.	**Calculus I:** Expansion of functions by McLaurin's and Taylor's for one variable; Taylor's theorem for function of two variables, PartialDifferentiation, Maxima & Minima (two and three variables), Method of Lagrange's Multipliers.

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Suggestivelistofexperiments:	
2.	**Calculus II:**Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surfaceareas and volumes of revolutions. Multiple Integral, Change the order of the integration, Applications ofmultiple integrals for calculating area and volumes of the curves.
3.	**Matrices:** Rank of a Matrix, Solution of Simultaneous Linear Equations by Elementary Transformation, Consistency of Equation, Eigen Values and Eigen Vectors, Diagonalization ofMatrices, Cayley-Hamilton theorem and its applications to find inverse.
4.	**Vector Calculus:** Differentiation of Vectors, Scalar and vector point function, Gradient, Geometrical meaning of gradient, Directional Derivative, Divergence and Curl, Line Integral, Surface Integral and Volume Integral, Gauss Divergence, Stokes and Green theorems.
5.	**Concept of Probability:** Probability Mass function, Probability DensityFunction, Discrete Distribution: Binomial, Poisson's, Continuous Distribution: NormalDistribution, Exponential Distribution.

ReferenceBooks-
Textbooks/References: 1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition,Pearson, Reprint, 2002. 2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006. 3. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008. 4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11thReprint, 2010. 5. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005. 6. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008. 7. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010. 8. S.S. Sastry, Introductory methods of numerical analysis, PHI, 4th Edition, 2005

Dr. Hariom Dubey
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TECHNOCRATS INSTITUTE OF TECHNOLOGY
(An Autonomous Institute Affiliated to RGPV, Bhopal)
DEPARTMENT OF ENGINEERING MATHEMATICS

Semester/Year		I/I	Program		B Tech- MECH. ENGG.
Subject Category	BSC	Subject Code:	BS-101 ME	Subject Name	Engineering Mathematics Level - I

Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
ES	MS	Assignment/Quiz	ES	LW		L	T	P	
70	20	10	-	-	100	2	1	0	3

Course Objective:

The objective of this course is to familiarize the prospective engineers with techniques in calculus, multivariate analysis and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines. More precisely, the objectives are:

- To introduce the idea of applying differential and integral calculus to notions of curvature and to improper integrals. Apart from some applications it gives a basic introduction on Beta and Gamma functions.
- To introduce the fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems.
- To develop the tool of power series and Fourier series for learning advanced Engineering Mathematics.
- To familiarize the student with functions of several variables that is essential in most branches of engineering.
- To develop the essential tool of matrices and linear algebra in a comprehensive manner.

UNITs	Descriptions
1	**Calculus-1:** Rolle's theorem, Mean Value theorems, Expansion of functions by Mc. Laurin's and Taylor's for one variable; Taylor's theorem for function of two variables, Partial Differentiation, Maxima & Minima (two and three variables).

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2	**Calculus-2:** Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolutions. Multiple Integral, Change the order of the integration, Applications of multiple integral for calculating area and volumes of the curves.
3	**Vector Spaces:** Vector Space, Vector Sub Space, Linear Combination of Vectors, Linearly Dependent, Linearly Independent, Basis of a Vector Space, Linear Transformations.
4	**Matrices:** Rank of a Matrix, Solution of Simultaneous Linear Equations by Elementary Transformation, Consistency of Equation, Eigen Values and Eigen Vectors, Diagonalization of Matrices, Cayley-Hamilton theorem and its applications to find inverse.
5	**Concept of Probability:** Probability Mass function, Probability Density Function, Discrete Distribution: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Exponential Distribution Coefficient of Correlation Regression.

Textbooks/Reference Books-

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition,Pearson, Reprint, 2002.
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
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5. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
6. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
7. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.

List/Links of e-Learning Resource

1. https://nptel.ac.in/courses/111/107/111107112/
2. https://nptel.ac.in/courses/111/104/111104092/
3. https://nptel.ac.in/courses/111/107/111107108/
4. https://nptel.ac.in/courses/111/107/111107108/
5. https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-ma07/

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TECHNOCRATS INSTITUTE OF TECHNOLOGY

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DEPARTMENT OF MATHEMATICS

Semester/Year		I/I	Program		B.Tech (All Branches)				
Subject Category	BSC	Subject Code:	BS-107	Subject Name	Critical Reasoning & Cognitive Ability: Level-1				
MaximumMarksAllotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
ES	MS	Assignment/Quiz	ES	LW		L	T	P	
70	20	10	-	-	100	2	-	-	2

CourseObjective:

The student will be able to

1. Use their logical thinking and analytical abilities to solve Quantitative aptitude questions from company specific and other competitive tests.
2. Solve questions related to Number system and Ratio etc. from company specific and other competitive tests.
3. Develop critical thinking which is required for company specific and other competitive tests.

UNITs	Descriptions
I	**NUMBER SYSTEM-I** 1.1 CLASSIFICATION OF NUMBERS: Natural Number, Whole Number, Integer Number, Rational and Irrational Number, Real Number, Complex Number, Prime Number, Co-prime Number, Semi Prime Number, Composite Number, Even and Odd Number, Perfect Square Number, Perfect Cube Number. 1.2 SIMPLIFICATION: BODMAS Rule, Surds-Definition, properties and problems, Indices-Rules of indices-power rule, Multiplication rule, Division rule, problems on indices, Find square root of perfect square number, Approximate square root of Non Perfect Square number, Find cube root of perfect cube number, Approximate cube root of non- perfect cube number. 1.3 PRIME FACTORIZATION: Definition, Prime factorization methods - Division method, Factor tree method. 1.4 APPLICATION OF PRIME FACTORIZATION: To find Total Factors, Total Even & Odd Factors, Total Perfect Square, Perfect Cube Factors, Euler Number, sum of factors, Product of factors, Express composite number as product of two number, two co-prime numbers.
II	**NUMBER SYSTEM –II** 2.1 DIVISIBILITY RULE: For Natural Numbers From 1 to 15, General rule for Composite Numbers. 2.2 LCM & HCF: Definition of Factors, Multiples, LCM & HCF, Prime Factorization Method for LCM & HCF, Division Method for LCM & HCF, LCM & HCF of Decimal numbers, LCM & HCF of Rational numbers, Relation between LCM & HCF, Properties of LCM and HCF, Applications based problem.

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	2.3 POWER Of PRIME: Power of Prime in Factorial Number, Power of (Prime)^N in Factorial Number, Power of composite number in Factorial number. 2.4 REMAINDER CONCEPTS: Definition, Concept of negative remainder, Remainder of sums, Remainder of product, Remainder Theorems- Euler theorem, Fermat's Theorem, Wilson theorem, Binomial theorem, Chinese theorem, Euler's theorem.
III	**RATIO, PROPORTION & VARIATION** 3.1 RATIO: Definition, Types of ratio-Duplicate ratio, Triplicate ratio, Sub-duplicate ratio, Sub triplicate ratio, Inverse ratio, Compound ratio, combined ratio, properties of ratio, Ratio based word problems. 3.2 PROPORTION: Definition, Types of proportion-Fourth proportion, Third proportion, Mean proportion, Properties of proportion, proportion based word problems. 3.3 VARIATION: Direct variation, Indirect Variation, How to identify Direct variation, Indirect Variation, word problems.
IV	**APPLICATIONS OF RATIO** 4.1 PROBLEM ON AGES: Basic concepts, Age problems based on ratio, age problems based on average. 4.2 PROBLEM ON PARTNERSHIP: Partner, Types of Partner, Working Partner or Active Partner, Sleeping Partner, Types of Partnership, Simple Partnership, Compound Partnership 4.3 MIXTURE & REPLACEMENT PROBLEMS: Mixture of two elements, mixture of more than two elements - mixture containing 3 ingredients, mixture containing 4 ingredients, mixing without replacement, mixing with replacement - When the quantity withdrawn and the quantity replaced are of the same volume, When the quantity withdrawn and the quantity replaced are of the same volume, but the total volume before replacement does not remain the same, When the quantity withdrawn and the quantity replaced are not of the same volume, mixing of two different mixtures. 4.4 ALLEGATION: Concept of allegation, the allegation situation, graphical representation of allegation, Mixture of two elements or mixtures, Mixture of three elements and mixtures.
V	**LOGICAL REASONING** 5.1 Coding Decoding – Simple alphabet shifting i.e. moving the letters one or more step forward or backward. Analogical letter coding (Direct Coding). Letters of the given word are written (partly or wholly) or interchanges. Replacement of the letters in original alphabet series by the same positioned letters in reverse alphabet series. Substitution of digits / Symbols for letters or vice-versa. Coding based on matrix. Column coding. Conditional coding. Decoding Message words / codes. Decoding of number / symbol. 5.2 Direction and sense- Turns and Rotations. Distance and Displacement. Shadow based (At the time of sunrise; At the time of sunset; At 12.00 Noon) . Coded Direction and Distance. Direction Puzzle. 5.3 Cube and Dice: Cubes- find number of pieces when number of cuts are given, find Minimum Number of Pieces when total numbers of cuts are given, find Maximum Number of Pieces when total number of cuts is given, find Number of cuts when total numbers of pieces are given, Painted Cube (Same Color), Painted Cube (Different Color), opening a cube, cube net patterns, Dice. 5.4 Water Image, Mirror Image, paper cutting & Folding

ReferenceBooks-

R.S.AGARWAL,ARUN SHARMA, M.TYRA
List/Linksofe-learning resource

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TECHNOCRATS INSTITUTE OF TECHNOLOGY

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DEPARTMENT OF ENGINEERING PHYSICS

Semester/Year		I & II / I	Program		B.Tech – ALL BRANCHES				
Subject Category	BSC	Subject Code:	BS-202	Subject Name	Engineering physics & Its applications				
Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
ES	MS	Assignment/Quiz	ES	LW		L	T	P	
70	20	10	30	20	150	2	0	2	3

Course Objective:

The objective of this course is to familiarize the prospective engineers with techniques in calculus and linear algebra. It aims to equip the students to deal with advanced level of physics and applications that would be essential for their disciplines.

1. To introduce the concept of quantization of energy and wave-particle duality through quantum mechanical models and their engineering applications.
2. To enable students to determine the energy levels of microscopic particles using Schrödinger's equation and apply quantum principles to real systems like semiconductors and lasers.
3. To provide foundational understanding of the electrical behavior of semiconductors and functioning of p-n junction-based devices.
4. To develop the ability to apply equations of static equilibrium for solving planar force systems and analyzing pin-jointed trusses.
5. To enable students to analyze simply supported and cantilever beams to determine shear force and bending moment distributions under various loading conditions.

UNITs	Descriptions	Hrs.
1	**WAVE OPTICS AND ELECTROMAGNETIC PHENOMENON** Light as wave, Interference of light in Newton's Rings and Michelsons interferometer, diffraction at single slit, concept of polarization of light. Scalar	10

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	and Vector field, idea of Gradient, Divergence, Curl, stokes and Gauss divergence theorem (without proof), Maxwell's Equations in vacuum, electromagnetic waves, poynting vector	
2	**QUANTUM THEORY** Origin of Quantum Theory, planck radiation law, de-Broglie's hypothesis for mattter wave , concept of phase and group velocities, Heisenberg 's uncertainty relation for position-momentum, energy -time, Schrodinger's equations, wave function: properties and significance, energy of a particle in one dimensional box.	10
3	**ELECTRONICS & LASER** Free electrons model of solids, kroning penny model (without derivation), distinction between conductor insulators and semiconductors on the basis of band theory of solids, intrinsic and extrinsic semi conductors, PN junction, zener breakdown, solar cell, Hall effect. Self emission, stimulated emission, Einstein's A and B coefficients, relation between A and B, active medium, population inversion, pumping, meta-stable state, optical resonator cavity ,Ruby Laser and Helium Neon Laser, applications of Laser.	10
4	**FORCES AND EQUILIBRIUM** Graphical and analytical treatment of concurrent, non concurrent and co-planner forces, free body diagram, force diagram and Bow's notations, Application of Equilibrium Concepts, Analysis of plane Trusses: Method of joints, Method of sections, frictional force in equilibrium.	8
5	**MOMENT OF INERTIA AND SIMPLE BEAMS** Centroid and centre of gravity, Moment of Inertia of Area and Mass, Radius of Gyration, Introduction to product of Inertia and Principle Axes, Analysis of cantilever & simply supported beams loaded with concentrated, distributed load and couple for support reactions, shear force and bending moment.	8

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CDr. Rajnish Kumar Mishra

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(Bhaskar Sharma)

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ReferenceBooks-

SN	UNIT NAME	AUTHOR NAME
1	Quantum Mechanics	D.J. Griffiths and Ajoy Ghatak
2	Wave Optics	Ajoy Ghatak
3	Introduction to Solids	H. K. Malik
4	Lasers and Fiber Optics	O. Svelto
5	Electrostatics in vacuum	D.J. Griffiths
6	Engineering Mechanics	R.S. Kurmi
7	The Elements of Statics & Dynamics	S.L. Loney

Suggestive list of experiments:

1. To determine the dispersive power of prism.
2. To determine the λ of sodium light with the help of Newton's Ring.
3. Resolving Power of Telescope.
4. YDSE (Young's double slit Experiment).
5. To determine the frequency of AC mains supply.
6. V-I Characteristics of P-N junction diode.
7. To determine the λ of diode loses by single slit diffraction.
8. To determine the plank's constant with the help of photocell.
9. Hall's effect experiment.
10. Calibration of ammeter by using reference Zener diode.
11. To study the effect of temperature on reverse saturation current in P-N junction diode and to determine the energy band gap.
12. To determine the λ of sodium by using plane diffraction grating.
13. To determine the moment of inertia of fly wheel by falling weight method

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TotalHours	46

CourseOutcomes:

CO No.	Course Outcome Statement
CO1	Verify electromagnetic wave phenomena such as interference, diffraction, and polarization in the visible region, and relate them to Maxwell's equations.
CO2	Solve the energy Eigenvalue problem of an electron in a one-dimensional potential well using Schrödinger's equation.
CO3	Explain the voltage-current characteristics of a p-n junction diode and evaluate laser output based on methods to enhance stimulated emission.
CO4	Apply the given truss and force system using equation of equilibrium.
CO5	Determination of Moment of Inertia of Area and Masses of a Body

Mapping

COs	POs											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	1	2	-	-	-	-	-	1	1	2
CO 2	3	3	2	2	2	-	-	1	-	-	1	1
CO 3	2	1	2	-	2	-	-	-	-	-	1	-
CO 4	1	1	-	-	1	-	-	-	-	-	2	2
CO 5	3	3	2	2	-	-	-	-	-	-	-	2

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TECHNOCRATS INSTITUTE OF TECHNOLOGY

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B. Tech. First Year (I Semester)
Branch: Common to All Disciplines

Semester/Year		I/I	Program		B.Tech				
Subject Category	ES	Subject Code:	ES-203	Subject Name	Elements of Civil and Mechanical Engineering				
Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks	L	T	P	
ES	MS	Assignment/Quiz	ES	LW					
70	20	10	30	20	150	2	0	2	3

Course Objective:

With the successful completion of the course, the student should have the capability to:

1. Explain properties on engineering materials.
2. Explain basic laws and concepts of fluid flow
3. Identify suitable building materials for construction.
4. Work with survey observations for fixing the position of points, and perform calculations for quantity.

UNITs	Descriptions	Hrs.
1	**Engineering Materials:-** Classification of engineering materials, Mechanical properties of materials, Hooke's law and modulus of elasticity, Tensile test- Stress-strain diagram of ductile and brittle materials, Hardness and Impact testing of materials. Classification, properties and applications of Cast iron and Carbon steels. Alloy steels and their applications.	6
2	**Basic concepts:-** Property, Equilibrium, State, Process, Cycle, Zeroth law of thermodynamics, Heat and work transfer. First law of thermodynamics, First law applied to various systems and processes. Limitations of first law of thermodynamics. Second law of thermodynamics: heat engine, Refrigerator, heat pump, Carnot's cycle. Basic concepts of heat transfer: Modes of heat transfer, Fourier's law, Newton's law, Stefan –Boltzmann's law. Air-standard Otto, Diesel and Dual cycles, P-V & T-S diagrams and their efficiencies, working of four stroke & two stroke Petrol & Diesel engines. Working principle of compressor. Steam Engineering: Formation of steam, Steam properties, use of steam tables, Classification and working of Modern boilers, mountings and accessories of boilers, Thermal Efficiency and equivalent evaporation, natural and artificial draught.	14

3	**Fluid Mechanics:** Fluids : Fluid properties, Newton's law of viscosity , Types of fluids , Pascal's law ,Hydrostatic Principle, Bernoulli's equation for incompressible fluids, Classification and working principle of Hydraulic machines, pumps, turbines.	8

4	**Building Materials & Construction:** Types, properties, test & use of common building materials like stones, bricks, cement, lime, timber and glass. Laboratory tests on concrete and brick (workability, compressive strength). Nominal proportion of concrete, preparation of concrete, compaction and curing of concrete. Elements of common building, types of building foundations (Isolated footing, conventional spread footings, combined footing, RCC footings), brick masonry walls, plastering and pointing. Common types of floors, roofs, doors, windows, lintels, staircases and their suitability .	8
5	**Surveying & Levelling:** Classification of survey, principles, linear and angular methods of measurement. Importance of survey stations, survey lines- ranging, bearing of survey lines, tape corrections, traversing with compass and level, adjustment of error in traversing. Introduction to Plane table surveying, **Leveling and Countering:** Leveling: Principles of leveling- booking and reducing levels (HI and Rise and Fall Method). Types of levelling cross sectioning. Digital and Auto Level, Errors in leveling. Contouring: characteristics, uses, computation of areas, volumes and quantity.	14

List of Experiments:
Students are required to perform minimum ten experiments from the following list by selecting minimum one experiment from each unit of syllabus.

1. Study of Universal Testing Machine.
2. To perform tensile testing on a MS specimen
3. Verification of Bernoulli's therom.
4. Study of various types of boilers.
5. Study of different types of Turbine.
6. Study of different IC Engines.
7. Study of different types of Boilers Mountings and accessories.
8. Study of electric and hybrid vehicles
9. To perform traverse surveying with prismatic compass, check for local attraction and Determine the corrected bearings and to balance the traverse by Bowditch's rule.
10. To perform leveling exercise by height of instrument and Rise and fall method.
11. To measure horizontal and vertical angles in the field by using Theodolite.
12. To determine (a) normal consistency (b) Initial and Final Setting time of a cement Sample.

13. To determine the workability of fresh concrete of given proportions by Slump test
    or
    Compaction factor test.
14. To determine the Compressive Strength of brick sample.
15. To determine particle size distribution and fineness modulus of course and fine Aggregate.

Reference Books:

1. Kothandaraman & Rudramoorthy, Fluid Mechanics & Machinery, New Age
2. Nag P.K, Engineering Thermodynamics , TMH
3. Ganesan , Internal Combustion Engines, TMH
4. Agrawal C M, Basic Mechanical Engineering, Wiley Publication.
5. S. Ramamrutam & R.Narayanan; Basic Civil Engineering, Dhanpat Rai Pub.
6. Punmia, B.C., Surveying, Standard book depot.
7. Surveying by Duggal – Tata McGraw Hill New Delhi.
8. Building Construction by S.C. Rangwala- Charotar publications House, Anand.
9. Building Construction by Grucharan Singh- Standard Book House, New Delhi

CO	On successful completion of the course, the students will be able to –
CO1	Assess the engineering properties of ferrous materials.
CO2	Apply the laws of thermodynamics in steam engineering and study of reciprocating machines.
CO3	Apply elementary principles of fluid statics and dynamics.
CO4	Asses the use of suitable building material for construction of a common building.
CO5	Apply the concepts of surveying and levelling while computing the quantity of earth work in a project.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	PO_{11}	PO_{12}
CO-1	2					2	2	2	1	2		
CO-2	2	2					1			1		2
CO-3	2	2							2	2		2
CO-4	2	2	2	2	-	-	-	-	3	3	-	2
CO-5	3	3	2	2	3	-	-	-	3	3	-	2

K.Kapadia

TECHNOCRATS INSTITUTE OF TECHNOLOGY

(An Autonomous Institute Affiliated to RGPV Bhopal)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

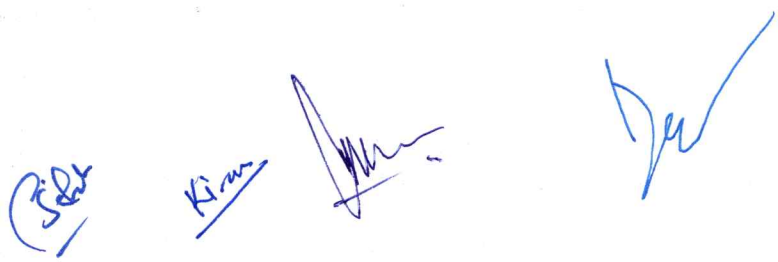
Semester/Year		I / I	Program		B.Tech (All Branches)				
Subject Category	ESC	Subject Code:	ES-105	Subject Name	Basic Computer Programming Level-1				
Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
ES	MS	Assignment/Quiz	ES	LW		L	T	P	
-	-	-	30	20	50	-	-	6	3

Course Objective:

1. Features of C++ language
2. Language components.
3. Develop middle level application
4. OOP concepts
5. How to define and use class, object, inheritance, and encapsulation.
6. How to develop programs using exception handling, templates, Generics
7. Understand basics of data structure

UNITs	Descriptions
I	**'C' Basics:** C Fundamentals, C character set, Identifiers, Keywords, Constants, Variables, Comments, escape sequences, Instructions, Program, C++ Program Structure, Compilation, Input/Output Operation **Operators:** Operators and operands, Types of operators, Arithmetic Operations, Relational Operators, Logical Operators, Increment and decrement Operators, Bitwise Operators, Conditional Operators, sizeof() Operators, Assignment Operators, Order of Precedence (priority), Associativity, Data type conversion, Automatic or implicit, Explicit or casting, **Control Statements: Selection,** The if statement, nested if, if-else-if ladder, The? Operator, The switch statement, nested switch **Looping & Iteration:** The for Statement, declaring variables within, for loop. The while Statement, The do-while Statement **Jump:** The break, goto and continue statement, return and exit
II	**Arrays:** One and Multi-Dimensional Arrays, Array Declaration And Accessing, Using char, int, float arrays, Variable length arrays, Array initializations, unsized array initialization **Functions:** Function Basics, Function prototyping, Parameter Passing, Recursive Functions **Strings:** Strings declaration, Strings functions, Array of strings **Pointers:** Pointer Basics, Pointer Declarations, Pointer Operations, Pointer Arithmetic, assignment, comparisons, Pointers and Arrays, Equivalence Between Pointers and Arrays, Arrays and Pointers as Function Arguments, Call by value and call by reference, Returning pointers from function, functions of void type, Multiple indirections (Pointer to pointer), References, Reading Command Line Arguments

III	**Object oriented programming concepts:** Object concepts, definitions & examples, OO Programming and Structured Programming, Introduction to oops, advantages of oops, Object-Oriented Terminology, Object-Oriented Paradigm, Abstract Data Types, **Classes and Objects:** Defining Classes in C++, Classes and Encapsulation, Member Functions, Instantiating and Using Classes, accessing object members using dot (.) operators **Structure,** Defining Structure, Advantages and Disadvantages, accessing members of the structure, Passing a structure to a function, Friend functions, Use of the "this" pointer, Default Arguments, Inline Functions **Constructors and Destructor:** Constructor Overloading, Default Constructor, Copy Constructor
IV	**Inheritance:** Defining Base and Derived Classes, Constructor and Destructor Calls, Access controls, Constructors for derived classes, Use of pointers with base/derived classes, Friend Class **Polymorphism:** Function overloading, Operator overloading, Virtual Functions, Pure Virtual, Functions, Abstract Class **Encapsulation:** Access control, public, private, protected
V	**Advanced C++ programming and Introduction to Data structure** **Storage Management:** Dynamic Allocation: new and delete **File I/O** **Exception Handling: E**xceptions, Try, catch, throw keywords **Templates: M**ethod Template, Class templates, Standard Template Library Containers **Namespace:** Defining namespace, properties of namespace, Namespace and version control, Restrictions on namespace, Using namespace **Generic programming and Standard Templates Library:** Containers, Iterators, Algorithm, Functions objects, Adaptors, Allocators, Specialized and Associative Containers **Introduction to data structure:** Arrays, stack, queue, linked list, tree, graph, searching, and sorting **Projects**



Course Outcomes:

CO1: Understand the fundamentals of C and C++ programming including syntax, operators, control structures, loops, and functions to develop basic programs.

CO2: Demonstrate proficiency in handling arrays, strings, pointers, and function concepts including recursion and pointer arithmetic for modular and efficient program design.

CO3: Apply object-oriented programming principles such as classes, objects, encapsulation, constructors, destructors, and friend functions to build structured C++ programs.

CO4: Analyze and implement advanced OOP features including inheritance, polymorphism, operator overloading, and encapsulation to design reusable and maintainable code.

CO5: Develop programs using advanced C++ features like dynamic memory management, templates, namespaces, file I/O, exception handling, and implement basic data structures for real-time applications.

Reference Books-

1. "Programming in ANSI C", Author: E. Balagurusamy, Publisher: McGraw Hill Education
2. "Object-Oriented Programming with C++", Author: E. Balagurusamy, Publisher: McGraw Hill Education
3. "Data Structures and Algorithms in C++", Author: Adam Drozdek, Publisher: Cengage Learning

List/Links of e-learning resource

CodeChef – Data Structures & Algorithms Practice

Link: https://www.codechef.com/practice/tags/datastructures

LeetCode https://leetcode.com/explore/

- Practice problems grouped by data structures. Great for hands-on coding.

HackerRank – Data Structures Track

https://www.hackerrank.com/domains/tutorials/10-days-of-data-structures

- Covers arrays, linked lists, stacks, queues, trees, etc.

Suggestive list of experiments:

1. Write a program in C to demonstrate all types of operators (arithmetic, relational, logical, bitwise, conditional, sizeof, assignment).
2. Write a program in C to accept a number and check whether it is even or odd using if-else.
3. Write a C program to find the largest among three numbers using if-else-if ladder.
4. Write a C program to demonstrate use of switch-case and nested switch (e.g., calculator menu).
5. Write a program using different loop structures (for, while, do-while) to print prime numbers between 1 and 100.
6. Write a program using break, continue, and goto statements to control loop flow.
7. Write a program to perform matrix addition, subtraction, and multiplication using 2D arrays.
8. Write a program in C to demonstrate call-by-value and call-by-reference using functions.
9. Write a program in C to implement recursive functions (e.g., factorial, Fibonacci series).
10. Write a program to perform various string operations using standard string functions (strlen, strcpy, strcat, strcmp, etc.).
11. Write a program to demonstrate pointer arithmetic and pointer with arrays.
12. Write a program in C++ to define a class, create objects, and access member functions using the dot operator.
13. Write a C++ program to demonstrate constructor overloading and use of destructors.
14. Write a program in C++ to implement single, multilevel, and multiple inheritance using base and derived classes.
15. Write a C++ program to demonstrate function overloading and operator overloading.

TECHNOCRATS INSTITUTE OF TECHNOLOGY

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DEPARTMENTOFHUMANITIES

Semester/Year		I / I	Program		B.Tech (All Branches)				
Subject Category	HSMC	Subject Code:	HS-106	Subject Name	Business Communication: Level-1				
MaximumMarksAllotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
ES	MS	Assignment/Quiz	ES	LW		L	T	P	
70	20	10	30	20	150	2	-	2	3

CourseObjective:
1. To develop basic grammar and vocabulary to frame correct sentences 2. To explain basic behavioral skills to enhance an impactful personality 3. To define the process of speaking and listening skills to build up good confidence level

UNITS	Descriptions
UNIT I – Basic Grammar	Parts of speech: appropriate application and usage of Noun, Pronoun, Verb, Adjective, Adverb, Preposition, Conjunction, Interjection, Grammar Usage, Articles, Subject-Verb-Agreement, Tenses
UNIT II – Vocabulary	Root words, Give one word, Prefix, Suffix, Synonyms, Antonyms, Analogy
Unit-III: Writing Skills	Paragraph Writing (100-120), Poster Writing, Self-introduction, Business Letter Writing, Writing Application, Technical Description, Precis writing
Unit-IV: Behavioral Skills	Basic Behavioral Skills: Etiquettes & manners in Professional life, Basics of Communication, Process of Communication, Types of Communication,7 C'S Of Communication, Barriers to Communication, Non-verbal Communication
Unit-V: Speaking & Listening	Introducing self and others, Role play, Situation based conversation, Impromptu, JAM, Listening skills: Active & passive listening, Stages of LS, Barriers to effective listening skill, Non-verbal cues in listening, role of listening in different scenarios

(Dr. Indira Jawed)

(Aftab Baig)

(Bhasha Sharma)

ReferenceBooks-
Business Communication by K.K.Sinha &Ruchi Sehgal Mohindra The Ultimate Business communication Book by Martin Manser, David Cotton, Matt Avery, DiMcLanachan, Martin Manser
List/Linksofe-learningresource

TECHNOCRATS INSTITUTE OF TECHNOLOGY

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DEPARTMENT OF MATHEMATICS

Semester/Year		I/I	Program		B.Tech (All Branches)				
Subject Category	BSC	Subject Code:	BS-107	Subject Name	Critical Reasoning & Cognitive Ability: Level-1				
MaximumMarksAllotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
ES	MS	Assignment/Quiz	ES	LW		L	T	P	
70	20	10	-	-	100	2	-	-	2

CourseObjective:

The student will be able to

1. Use their logical thinking and analytical abilities to solve Quantitative aptitude questions from company specific and other competitive tests.
2. Solve questions related to Number system and Ratio etc. from company specific and other competitive tests.
3. Develop critical thinking which is required for company specific and other competitive tests.

UNITs	Descriptions
I	**NUMBER SYSTEM-I** 1.1 CLASSIFICATION OF NUMBERS: Natural Number, Whole Number, Integer Number, Rational and Irrational Number, Real Number, Complex Number, Prime Number, Co-prime Number, Semi Prime Number, Composite Number, Even and Odd Number, Perfect Square Number, Perfect Cube Number. 1.2 SIMPLIFICATION: BODMAS Rule, Surds-Definition, properties and problems, Indices-Rules of indices-power rule, Multiplication rule, Division rule, problems on indices, Find square root of perfect square number, Approximate square root of Non Perfect Square number, Find cube root of perfect cube number, Approximate cube root of non- perfect cube number. 1.3 PRIME FACTORIZATION: Definition, Prime factorization methods - Division method, Factor tree method. 1.4 APPLICATION OF PRIME FACTORIZATION: To find Total Factors, Total Even & Odd Factors, Total Perfect Square, Perfect Cube Factors, Euler Number, sum of factors, Product of factors, Express composite number as product of two number, two co-prime numbers.
II	**NUMBER SYSTEM –II** 2.1 DIVISIBILITY RULE: For Natural Numbers From 1 to 15, General rule for Composite Numbers. 2.2 LCM & HCF: Definition of Factors, Multiples, LCM & HCF, Prime Factorization Method for LCM & HCF, Division Method for LCM & HCF, LCM & HCF of Decimal numbers, LCM & HCF of Rational numbers, Relation between LCM & HCF, Properties of LCM and HCF, Applications based problem.

Dr. Hariom Dubey
Dr. Jyoti Gupta
(Dr. Manoj JLV)
(Dr-C-K-Verma)
(Aftab Baig)
Bhasha Sharma

	2.3 POWER Of PRIME: Power of Prime in Factorial Number, Power of (Prime)^N in Factorial Number, Power of composite number in Factorial number. 2.4 REMAINDER CONCEPTS: Definition, Concept of negative remainder, Remainder of sums, Remainder of product, Remainder Theorems- Euler theorem, Fermat's Theorem, Wilson theorem, Binomial theorem, Chinese theorem, Euler's theorem.
III	**RATIO, PROPORTION & VARIATION** 3.1 RATIO: Definition, Types of ratio-Duplicate ratio, Triplicate ratio, Sub-duplicate ratio, Sub triplicate ratio, Inverse ratio, Compound ratio, combined ratio, properties of ratio, Ratio based word problems. 3.2 PROPORTION: Definition, Types of proportion-Fourth proportion, Third proportion, Mean proportion, Properties of proportion, proportion based word problems. 3.3 VARIATION: Direct variation, Indirect Variation, How to identify Direct variation, Indirect Variation, word problems.
IV	**APPLICATIONS OF RATIO** 4.1 PROBLEM ON AGES: Basic concepts, Age problems based on ratio, age problems based on average. 4.2 PROBLEM ON PARTNERSHIP: Partner, Types of Partner, Working Partner or Active Partner, Sleeping Partner, Types of Partnership, Simple Partnership, Compound Partnership 4.3 MIXTURE & REPLACEMENT PROBLEMS: Mixture of two elements, mixture of more than two elements - mixture containing 3 ingredients, mixture containing 4 ingredients, mixing without replacement, mixing with replacement - When the quantity withdrawn and the quantity replaced are of the same volume, When the quantity withdrawn and the quantity replaced are of the same volume, but the total volume before replacement does not remain the same, When the quantity withdrawn and the quantity replaced are not of the same volume, mixing of two different mixtures. 4.4 ALLEGATION: Concept of allegation, the allegation situation, graphical representation of allegation, Mixture of two elements or mixtures, Mixture of three elements and mixtures.
V	**LOGICAL REASONING** 5.1 Coding Decoding – Simple alphabet shifting i.e. moving the letters one or more step forward or backward. Analogical letter coding (Direct Coding). Letters of the given word are written (partly or wholly) or interchanges. Replacement of the letters in original alphabet series by the same positioned letters in reverse alphabet series. Substitution of digits / Symbols for letters or vice-versa. Coding based on matrix. Column coding. Conditional coding. Decoding Message words / codes. Decoding of number / symbol. 5.2 Direction and sense- Turns and Rotations. Distance and Displacement. Shadow based (At the time of sunrise; At the time of sunset; At 12.00 Noon) . Coded Direction and Distance. Direction Puzzle. 5.3 Cube and Dice: Cubes- find number of pieces when number of cuts are given, find Minimum Number of Pieces when total numbers of cuts are given, find Maximum Number of Pieces when total number of cuts is given, find Number of cuts when total numbers of pieces are given, Painted Cube (Same Color), Painted Cube (Different Color), opening a cube, cube net patterns, Dice. 5.4 Water Image, Mirror Image, paper cutting & Folding

ReferenceBooks-

R.S.AGARWAL,ARUN SHARMA, M.TYRA
List/Linksofe-learning resource

Dr. Harpreet Duggal

Dr. Jyoti Gupta

(Dr. Manoj Jain)

(Aftab Baig)

(Bhasha Sharma)

TECHNOCRATS INSTITUTE OF TECHNOLOGY

(An Autonomous Institute Affiliated to RGPV Bhopal)

B. Tech. First Year (I Semester)
Branch: Common to All Disciplines

Semester/Year		I/I	Program		B.Tech				
Subject Category		Subject Code:	109-B	Subject Name	Workshop				
Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
ES	MS	Assignment/Quiz	ES	LW		L	T	P	
0	0	0	30	20	50	0	0	4	2

CourseObjective:

Manufacturing is fundamental to the development of any engineering product. The objective of this course is to provide engineering students with practical exposure to fundamental manufacturing processes through hands-on experience in various workshop practices. This includes operations in black smithy, carpentry, fitting, foundry, and welding shops. Students will learn the safe and effective use of hand tools, power tools, measuring instruments, and basic machines related to each trade.

Sr. No	Experiments
1	Black Smithy Shop Use of various smithy tools. Forging operations: Upsetting, Drawing down, Fullering, Swaging, Cutting down, Forge welding, Punching and drafting. Suggested Jobs: Forging of chisel. Forging of Screw Driver. Manufacturing Methods- casting, forming, machining, joining.
2	Carpentry Shop: Wood Working tools: Wood working machinery, joints & joinery. Various operations of planning using various carpentry planes sawing & marking of various carpentry joints. Suggested Jobs: Name Plate, Any of the Carpentry joint like mortise or tennon joint.
3	Fitting Shop: Study and use of Measuring instruments, Engineer steel rule, Surface gauges caliper, Height gauges, feeler gauges, micro meter. Different types of files, File cuts, File grades, Use of surface plate, Surface gauges drilling tapping Fitting operations: Chipping filling, Drilling and tapping.Suggested Jobs :Preparation of job piece by making use of filling, sawing and chipping , drilling and tapping operations.
4	Foundry: Pattern Making: Study of Pattern materials, pattern allowances and types of patterns. Core box and core print, .Use and care of tools used for making wooden patterns. Moulding: Properties of good mould & Core sand, Composition of Green, Dry and Loam sand. Methods used to prepare simple green and dry sand mould using single piece and split patterns.
5	Welding: Study and use of tools used for Brazing, Soldering, Gas & Arc welding. Preparing Lap & Butt joints using gas and arc welding methods, Study of TIG & MIG welding processes . Safety precautions.

(Dr. R. Ichedlu) (Dr. Vimlesh Soni) Dr. Vipin Tripathi (NITTTR)

Course Outcomes:
CO1: Understand and perform primary forging operations such as upsetting, drawing, and swaging and also Know about blacksmithy tools.
CO2: Practical knowledge of various carpentry operations and tools used in shop and also able to create lap joint of wooden material in carpentry shop
CO3: Understanding use measuring instruments and perform fitting operations like filing, sawing, drilling, and tapping on metal pieces.
CO4: Develop mould cavity in green sand of given pattern.
CO5: Demonstrate different welding operations in the welding shop.

ReferenceBooks-
1. Bawa HS; Workshop Practice, TMH
2. Rao PN; Manufacturing Technology- Vol.1& 2, TMH
3. John KC; Mechanical workshop practice; PHI
4. Hazara Choudhary; Workshop Practices -, Vol. I & II.
5. Jain. R.K. Production Technology
List/Linksofe-learningresource
1. https://www.youtube.com/watch?v=dTfjf69vMJU
2. https://www.youtube.com/watch?v=FwK8UAipEV4
3. https://www.youtube.com/watch?v=z_ggHbN3NtU
4. http://www.digimat.in/nptel/courses/video/112107078/L40.html
5. www.digimat.in/nptel/courses/video/112106179/L01.html

(Dr. R. Khedle)

(Dr. Vimlesh Soni)

Dr. Vipin Tripathi
(NSIT)

(Dr. Nitin Shrivastava)

TECHNOCRATS INSTITUTE OF TECHNOLOGY

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DEPARTMENTOFHUMANITIES

Semester/Year		I / I	Program		B.Tech (All Branches)					
Subject Category	HSMC	Subject Code:	HS-110 (J)	Subject Name	Foreign Language Level - 1 (Japanese)					
MaximumMarksAllotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
ES	MS	Assignment/Quiz	ES	LW		L	T	P	
-	-	-	-	50	50	-	-	4	2

CourseObjective:
1. To develop basic grammar and vocabulary to frame correct sentences 2. To explain basic behavioral skills to enhance an impactful personality 3. To define the process of speaking and listening skills to build up good confidence level

UNITS	Descriptions
UNIT I	Basic Introduction, Greetings, Simple Sentences Self-introduction, polite expressions Sentence structure: NはNです, これは～です Question forms, negation Daily verbs (たべます, のみます etc.) Time expressions, days, schedule Kanji: 人, 日, 月, 火, 水, 木, 金, 土 Listening: Basic audio comprehension (introductions, greetings) Assessment: Short test + speaking role-play
UNIT II	Daily Activities and Routine Verb conjugation (ます/ません/ました) Place + movement (へいきます, にいきます) Time + frequency words Likes/dislikes using すき/きらい Kanji: 行, 来, 食, 飲, 見, 話, 書, 読 Listening: Daily routine conversations Assessment: Listening + speaking test

Unit-III	Quantity, Preferences, Descriptions ーたいです (want to do) Counting items, money, duration Adjectives (い/な) があります／います Kanji: 大, 小, 高, 安, 新, 古, 友, 名 Listening: Shopping & asking about objects Assessment: Dialogue practice + kanji quiz
Unit-IV	Past Activities, Requests, Permissions て-form introduction ～てもいいですか, ～てはいけません Joining actions (ーて、ーて) Giving and receiving Kanji: 手, 目, 耳, 口, 話, 見, 行, 来 Listening: Asking permission and requests Assessment: Group speaking activity
Unit-V	Casual speech, Modifiers, Plans Dictionary form of verbs ～と思います, ～と言いました Modifying nouns with verbs Intention: ～つもりです, ～でしょう Kanji: 思, 言, 計, 週, 今, 年 Listening: Casual conversations, future plans Assessment: Short written task + presentation

ReferenceBooks-
Minna no Nihongo 1 and 2 (Main Course Book) Kanji and Genki plus and Gokakudekiru and Renshuu Book for other characters, unseen passage and new Kanji.
List/Linksofe-learningresource

(Aftab Baig) (Dr. Indira Javed) (Bhasha Sharma)