Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code:**2501UFYEBSC101** Course Name: **Engineering Physics**

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 03 Hours/Week	03	ISE: 40 Marks ESE: 60 Marks

Prerequisites, if any:

1. Fundamentals of properties of wave and particle and types of the solid.
2. Different phenomenon of light and sound.
3. Basic concepts of Atomic Physics and Nuclear energy.

Course Objectives:

The objective of the course is to

1. To provide the useful fundamental concepts of Physics to all Engineering disciplines.
2. To make the student aware of new techniques in Physics applicable to engineering practices.
3. To encourage them to understand engineering and technical development

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Summarize** the knowledge of basic quantum mechanics to understand wave particle dualism and uncertainty principle.
CO2	**Demonstrate** the different crystal structure and their properties by understanding crystal physics.
CO3	**Apply** the theory and phenomenon of nanophysics to produce nanomaterials
CO4	**Define** the basic requirements of Architectural Acoustics
CO5	**Illustrate** the different phenomenon of light.
CO6	**Explain** the concepts and applications of LASER and necessary tools for nuclear power plant.

Course Description:

Engineering Physics course is offered as the basic science course. This course contains wave – particle dualism and uncertainty principle, crystal structures and their properties, Approaches and techniques of nonmaterial and nanotechnology, Basic concepts of Architectural acoustics, Different phenomenon's of light, LASER and nuclear energy. These are useful fundamental concepts of Physics to all Engineering disciplines and to make the student aware of new techniques in Physics applicable to engineering practices.

Course Content

Unit-1	**Wave Mechanics**	6

Introduction, Wave-particle dualism (De-Broglie's Hypothesis -light and matter), De-Broglie's wavelength in terms of Kinetic Energy, Potential Difference and Temperature, Properties of matter waves, Heisenberg's uncertainty principle for position and momentum,

Compton Effect (statement, explanation and formula), Photoelectric Effect, Numerical.		
Unit-2	**Crystallography**	7
Introduction, Basics of crystal structure -Space Lattice, Basis, crystalline solid and Unit cell (geometry and types), Seven crystal system, Properties of unit cell for SC, BCC and FCC (number of atoms per unit cell, coordination number, atomic radius and packing density), Relation between density and lattice constant, Miller indices (procedure and sketches for planes), Bragg's x-ray spectrometer, Numerical.		
Unit-3	**Nanoscience and Nanotechnology**	6
Introduction, Nonmaterial's, Nanoscience and Nanotechnology, Top down and bottom up approaches, Production techniques - Ball milling and Colloidal, Types of nanomaterial, Properties of material at nanoscale (Surface to Volume ratio and Quantum confinement effect), Applications of nanomaterials, Characterizations - Scanning Tunnelling Microscope and Atomic Force Microscope.		
Unit-4	**Architectural Acoustics**	6
Introduction, Reverberation, Reverberation time, Absorption coefficient, Average absorption coefficient, Sabine's formula for reverberation time (no derivation), Factors affecting architectural acoustics and their remedy, Numerical.		
Unit-5	**Wave Optics**	7
Introduction, Theories of light, Interference of light and types, Diffraction of light and types, Construction of diffraction grating, Theory of Fraunhoffer diffraction by double slit, Resolving power of plane transmission grating, Polarization of light, double refraction, Huygens' theory of double refraction, Specific Rotation, Quarter wave plate and half wave plate, Laurent's half shade polarimeter, Numerical.		
Unit-6	**LASER and Nuclear Physics**	6
LASER: Introduction, Absorption, spontaneous emission and stimulated emission of radiations, Population inversion, Pumping energy, Characteristics of laser beams, Ruby laser. **Nuclear Physics:** Introduction, Nuclear Fission, Energy released by 1 Kg of U235, Nuclear fission reactor, Nuclear fusion, Thermonuclear reactions (proton-proton chain and Carbon Nitrogen cycle), Numerical.		
Learning Resources:		
Text Books 1) M. N. Avadhanulu and P. G. Kshirsagar, "A Text book of Engineering Physics", S.Chand and Company, New Delhi. 2) R. K. Gaur and S. L. Gupta "Engineering Physics", Dhanpat Rai Publications, New Delhi. 3) V. Rajendran – Engineering Physics- Mc. Graw Hills		
Reference Books 1) B. L. Theraja -Modern Physics - S. Chand & Company Ltd., Delhi 2) Subramanyam & BrijLal, A Text Book of Optics –S. Chand & Company (P.) Ltd. 3) B. K. Pandey and S. Chaturvedi- Engineering Physics, Cengage Learning 4) S. O. Pillai, Solid State Physics: Structure & Electron Related Properties, Eastern Ltd,, New Age International Ltd. 5) Charles Kittle, Introduction to Solid State Physics - Wiley India Pvt. Ltd.		

6) Alan Giambattista and others- Fundamentals of physics, Tata Mc. Graw Hills
7) Vijay Kumari- Engineering Physics, Vikas Publications
8) Resnick Halliday, Physics Volume-I, Krane -John Wiley & Sons Pub.
9) Resnick Halliday, Physics Volume-II, Krane -John Wiley & Sons Pub.
10) Hitendra K. Malik, A. K. Singh – Engineering Physics - Tata Mc. Graw Hills Education Private Ltd.
11) A. Beiser – Concepts of Modern Physics - Tata Mc. Graw Hills
12) L. J. Schiff – Quantum Mechanics - Tata Mc. Graw Hills

e-Books : Nil

MOOC / NPTEL/YouTube Links

1) https://nptel.ac.in/courses/115/101/115101010/
2) https://nptel.ac.in/courses/115/104/115104109/
3) https://nptel.ac.in/courses/115/105/115105099/
4) https://nptel.ac.in/courses/115/101/115101007/
5) https://www.youtube.com/playlist?list=PLbRMhDVUMngeGSqPVkrc8G_kApltxEEos
6) https://nptel.ac.in/courses/115/105/115105083/
7) https://nptel.ac.in/courses/115/102/115102124/
8) https://nptel.ac.in/courses/115/104/115104043/
9) http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
10) https://en.wikipedia.org/wiki/Fundamentals_of_Physics

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y.B.Tech)

Course Code: 2501UFYEBSC101T Course Name: Engineering Physics Lab

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 25 Marks

Prerequisites, if any:

1. Higher secondary level Physics
2. Fundamentals of wave optics, Band theory and crystal.

Course Objectives: The objective of the course is to

1. To furnish the conceptual understanding of the basic principles.
2. To make the students gain practical knowledge to relate with the Physics theory.
3. To encourage them to understand technical development.
4. To achieve perfectness in experimental skills and the study of practical applications will bring more confidence and ability to develop the skills needed to set up the equipment..

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Explain** the need for precise measurement practices for data recording.	
CO2	**Interpret** the principle, concept, working and applications of wave optics, band gap energy as well as Crystal relevant experiments.	
CO3	**Apply** the techniques and skills associated with modern scientific tools regarding LASER and Nuclear plants.	
CO4	**Develop**scientific communication skills while performing the experiments and interpreting the results to communicate effectively the scientific activities	
CO1	**Explain** the need for precise measurement practices for data recording.	
CO2	**Interpret** the principle, concept, working and applications of wave optics, band gap energy as well as Crystal relevant experiments.	

Course Description:

This course aims to make the students gain practical knowledge to relate with the theoretical studies and to use the principle in the right way to implement modern technology. The experiments are selected from various areas of Physics like Measurements, Wave Optics, Lasers, Solid state physics and Basic Electronics. The Engineering Physics Laboratory manual is written in a simple scientific language with aim, apparatus, theory, diagrams, formula, graphs and questions. These experiments will help the students to expertise in the analysis of various concepts in Optics, measurements, crystallography and electronics-related topics.

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Assigned Hours
1	Measurements in Physics	02
2	Resistor and Capacitor Code	02

3	Measurement of Band Gap Energy	02	
4	Study of seven Crystal Structure, Bravais Lattice and Properties of unit cell	02	
5	Study of Symmetry Elements of Cubic Crystal	02	
6	Determination of Interplaner distance using XRD pattern	02	
7	Miller Indices	02	
8	Divergence of LASER Beam	02	
9	Resolving power of Telescope	02	
10	Specific rotation by Polarimeter	02	
11	Wavelength of different spectral lines of mercury using grating.	02	
12	Determination of wavelength of LASER using diffraction grating.	02	
13	The grating constant of the diffraction grating	02	
14	Determination of e/m of an electron	02	
15	Resolving power of diffraction grating	02	

Learning Resources:

Text Books

1) Engineering Physics Lab Manual, TKIET Warananagar
2) Madhusudhan Rao, Engineering Physics Lab Manual, Scitech Publication
3) O.P. Singh, Vipin Kumar, R.P. Singh, Engineering Physics Practical Manual, Ram Prasad Publication

Reference Books

1) Resnick Halliday, Physics Volume-I, Krane -John Wiley & Sons Pub.
2) Resnick Halliday, Physics Volume-II, Krane -John Wiley & Sons Pub.

e-Book : Nil

MOOC / NPTEL/YouTube Links

1. http://vlab.amrita.edu/?sub=1&brch=281&sim=334&cnt=1
2. http://vlab.amrita.edu/?sub=1&brch=282&sim=370&cnt=1
3. http://vlab.amrita.edu/?sub=1&brch=189&sim=342&cnt=1
4. http://vlab.amrita.edu/?sub=1&brch=189&sim=343&cnt=1
5. http://vlab.amrita.edu/?sub=1&brch=282&sim=1507&cnt=1
6. http://vlab.amrita.edu/?sub=1&brch=195&sim=840&cnt=1
7. https://bop-iitk.vlabs.ac.in/exp/energy-band-gap/

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: 2501UFYEBSC102 Course Name: Engineering Mathematics-I

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 03 Hours/Week	03	ISE: 40 Marks ESE: 60 Marks

Prerequisites, if any:

1.Basic knowledge of Determinant, Matrix algebra
2.Basic knowledge of complex numbers,
3. Basic knowledge Differentiation and integration formulae.

Course Objectives: The objective of the course is to

1) To provide detailed of matrices which is applied for solving system of linear equations and useful in various fields of technology
2) This course enables the students to learn the concept of imaginary numbers and gives awareness about algebra of complex numbers which helps in understanding of engineering subjects like electrical circuits, Electromagnetic wave theory, and complex analysis etc.
3) To build ability to solve numerically system of linear equations, algebraic and transcendental equations. To provide an overview of the experimental aspect of applied mathematics.
4) This course enables to provide an overview of partial derivatives and its applications which is used for solving optimization problems and concepts is needed in study of wave, heat equation of various orders and also in calculation of errors in various engineering subjects.

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Find** rank of matrix and solve system of linear equations.
CO2	**Find** characteristic equation and use it to find eigen value, eigenvector, Higher power and inverse (if it exists) of square matrix.
CO3	**Use** De Moivre's Theorem to find roots of complex numbers And express sinnθ and cosnθ in powers of sinθ and cosθ
CO4	**Estimating** the value of a function for the given value of the independent variable
CO5	**Solve** system of linear equations using numerical methods
CO6	**Calculate** partial derivative and apply it to find extreme values of function of two variable

Course Description:

Engineering Mathematics-I course is offered as the basic science course. This course contains Mathematical methods and techniques that are typically used in engineering to solve complex engineering problems. This course has six units namely i) Matrices and Solution of Linear System Equations ii) Eigen Values and Eigen vectors, iii)Complex Numbers, iv) Numerical Solution of Linear simultaneous equations, v) Finite Differences, vi)Partial Differentiation and its Application

Course Content		
Unit-1	**Matrices and Solution of Linear System Equations**	7
Rank of matrix: Definition, Normal form and echelon form, System of linear Homogeneous equations, System of linear Non-homogeneous equations		
Unit-2	**Eigen Values and Eigen vectors**	7
Eigen Values, Properties of Eigen Values, Eigenvectors, Properties of Eigen vectors, Cayley-Hamilton's theorem(Without proof)		
Unit-3	**Complex Numbers**	7
De Moivre's Theorem (Without proof), Roots of complex numbers by using De Moivre's Theorem, Expansion of sinnθ and cosnθ in powers of sinθ and /or cosθ ,Circular functions of a complex variable, Hyperbolic and Inverse Hyperbolic Functions-definitions.		
Unit-4	**Finite Differences**	6
Forward & Backward difference operator, Shift operator, Interpolation & Extrapolation Methods, Newton's formulae (Equal intervals),Lagrange's Formulae (Unequal intervals).		
Unit-5	**Numerical Solution of linear simultaneous equations**	6
Gauss elimination method, Gauss-Jordan method, Jacobi's iteration method, Gauss-Seidel iteration method.		
Unit-6	**Partial Differentiation and its Application**	8
Partial derivatives: Introduction, Total derivatives, Euler's theorem on homogeneous function of two variables, Jacobian and its Properties, Maxima And Minima of functions of two variables		

Learning Resources:

Text Books

1) Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers, Delhi.
2) A textbook of Engineering Mathematics by N. P. Bali, Iyengar, Laxmi Publications(P) Ltd., New Delhi.
3) Engineering Mathematics I, G. V. Kumbhojkar, H. V. Kumbhojkar, C. Jamnadas & Co.

Reference Books

1) A textbook of Applied Mathematics, Vol. I, Vol.II,Vol. III by P. N. Wartikar & J. N. Wartikar, Pune Vidyarthi Griha Prakashan, Pune.
2) Numerical methods by Dr.B.S.Grewal, Khanna Publishers, Delhi.
3) Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India Pvt .Ltd.
4) Advanced Engineering Mathematics by H. K.Dass, S. Chand ,New Delhi.
5) A textbook of Engineering Mathematics Volume I by Peter V. O' Neil and Santosh K. Sengar, Cengage Learning.

MOOC / NPTEL/YouTube Links

1) https://nptel.ac.in/courses/111/107/111107112/
2) https://nptel.ac.in/courses/111/105/111105121/
3) https://nptel.ac.in/courses/111/107/111107105/
4) https://nptel.ac.in/courses/111/106/111106101/
5) https://nptel.ac.in/courses/111/107/111107108/

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code:**2501UFYEBSC102T**Course Name**: Engineering Mathematics-I Tutorial**

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 01 Hours/Week	01	ISA: 25 Marks

Prerequisites, if any:

1. Basic knowledge of Determinant, Matrix algebra
2. Basic knowledge of complex numbers,
3. Basic knowledge Differentiation and integration formulae.

Course Objectives: The objective of the course is to

1. To provide detailed of matrices which is applied for solving system of linear equations and useful in various fields of technology
2. This course enables the students to learn the concept of imaginary numbers and gives awareness about algebra of complex numbers which helps in understanding of engineering subjects like electrical circuits, Electromagnetic wave theory, and complex analysis etc.
3. To build ability to solve numerically system of linear equations, algebraic and transcendental equations. To provide an overview of the experimental aspect of applied mathematics.
4. This course enables to provide an overview of partial derivatives and its applications which is used for solving optimization problems and concepts is needed in study of wave, heat equation of various orders and also in calculation of errors in various engineering subjects.

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Find** rank of matrix and solve system of linear equations.
CO2	**Find** characteristic equation and use it to find eigen value, eigenvector, Higher power and inverse (if it exists) of square matrix.
CO3	**Use** De Moivre's Theorem to find roots of complex numbers And express $\sin n\theta$ and $\cos n\theta$ in powers of $\sin\theta$ and $\cos\theta$
CO4	**Estimating** the value of a function for the given value of the independent variable
CO5	**Solve** system of linear equations using numerical methods
CO6	**Calculate** partial derivative and apply it to find extreme values of function of two variable

Course Description:

Engineering Mathematics-I course is offered as the basic science course. This course contains Mathematical methods and techniques that are typically used in engineering to solve complex engineering problems. This course has six units namely i) Matrices and Solution of Linear System Equations ii) Eigen Values and Eigen vectors, iii)Complex Numbers, iv) Numerical Solution of Linear simultaneous equations, v) Finite Differences, vi)Partial Differentiation and its Application

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Assigned Hours
1	Rank by Normal form & Echelon form	1
2	Solution of system of linear equation	1
3	Eigen values & Eigen Vectors	1
4	Cayley Hamilton's Theorem	1
5	De Moivre's Theorem	1
6	Roots of complex number	1
7	Newton's Interpolation	1
8	Lagrange's Interpolation Formula	1
9	Gauss elimination method & Gauss Jordon method	1
10	Jacobi Iteration & Gauss Seidel Iteration Method	1
11	Partial Derivative, Euler's Theorem	1
12	Jacobian, Maxima & minima	1

Learning Resources:

Text Books

1) Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers, Delhi.
2) A textbook of Engineering Mathematics by N. P. Bali, Iyengar, Laxmi Publications(P) Ltd., New Delhi.
3) Engineering Mathematics I, G. V. Kumbhojkar, H. V. Kumbhojkar, C. Jamnadas & Co.

Reference Books

1) A textbook of Applied Mathematics, Vol. I, Vol.II,Vol. III by P. N. Wartikar & J. N. Wartikar, Pune Vidyarthi Griha Prakashan, Pune.
2) Numerical methods by Dr.B.S.Grewal, Khanna Publishers, Delhi.
3) Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India Pvt .Ltd.
4) Advanced Engineering Mathematics by H. K.Dass, S. Chand ,New Delhi.
5) A textbook of Engineering Mathematics Volume I by Peter V. O' Neil and Santosh K. Sengar, Cengage Learning.

MOOC / NPTEL/YouTube Links

1) https://nptel.ac.in/courses/111/107/111107112/
2) https://nptel.ac.in/courses/111/105/111105121/
3) https://nptel.ac.in/courses/111/107/111107105/
4) https://nptel.ac.in/courses/111/106/111106101/
5) https://nptel.ac.in/courses/111/107/111107108/

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code**: 2501UFYEESC103** Course Name**: Basic Electrical and Electronics Engineering**

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 02 Hours/Week	02	ISE: 40 Marks ESE: 60 Marks

Prerequisites, if any: Few basic electrical and Electronics components identification, Battery, Potential difference and current flow concept, Difference between AC & DC circuits

Course Objectives: The objective of the course is to provide the Knowledge with an introductory and broad treatment in the field of Electrical and Electronics Engineering.

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Apply** the KCL and KVL to determine the current and voltage of DC circuits .
CO2	**Describe** the basic concepts of Magnetic circuits.
CO3	**Describe** the concepts of Basic Electronics components.
CO4	**Illustrate** the Nature of single phase AC series and parallel RLC circuits by calculating impedance power factor and power consumption.
CO5	**Explain** the concept of 3 phase supply Generation , transmission , Utilization and its advantages.
CO6	**Solve** the problems related to power losses to determine the efficiency of single phase transformer.

Course Description: Basic Electrical & Electronics Engineering course is offered as the engineering science course. This course contains. Basic knowledge of Electrical & Electronics engineering and its advantages, applications. This course has six units namely i) Analysis of D.C. Circuits, ii) Magnetic circuits, iii) Fundamentals of electronics iv) Single phase AC circuits, v) Three phase AC circuits, vi). Single phase Transformer

Course Content

Unit-1	Title of Unit	
Concept of EMF, Potential difference, current, Power, Energy, Resistance, Ohms law, Kirchhoff's laws, Mesh & Node analysis**.** (Numerical treatment on Mesh& Node analysis of two loops)		05 Hrs
Unit-2	Title of Unit	
Concept of MMF, reluctance, magnetic flux, Magnetic flux density, magnetic field strength, Comparison of Electric & magnetic circuit, Analysis of Series magnetic circuits.		04 Hrs
Unit-3	Title of Unit	

Introduction of Diode and V-I characteristics, Rectifier configuration, Analysis of Half Wave Rectifier, Full wave Rectifier and Bridge Rectifier, Introduction of Transistor.	05 Hrs
Unit-4 Title of Unit	
Faradays laws, Lenz'sLaw, generation of sinusoidal voltage, Analysis of pure Resistive, Inductive, Capacitive circuits, Analysis of series R-L, R-C, R-L-C circuits. (NumericaltreatmentonseriesR-L,R-C,R-L-Ccircuits)	05 Hrs
Unit-5 Title of Unit	
Advantages of three phase system, Generation of three phase AC supply, phase sequence, Balanced system, Relation between line & phase quantities in Balanced star and Delta connected circuits.	04 Hrs
Unit-6 Title of Unit	
Construction, operating principle, types, EMF Equation, Turns Ratios, Ideal Transformer, Power losses. (Numerical treatment on EMF Equation)	05 Hrs

Learning Resources:

Text Books

1. P.V. Prasad and S. Shivan Raju– Electrical Engineering Concepts and applications–c engage learning.
2. B. H. Deshmukh, Electrical Engineering Concepts and applications
3. Robert L. Boysted and Louis Nashelsky, Electronics devices and circuit theory– Pearson education

Reference Books

1. B.L. Theraja–Electrical Technology Vol.1.-S. Chand publications.
2. Nagarath I. J. and D.P. Kothari – Basic Electrical Engineering (2001) – Tata Mc GrawHill
3. Bharati Dwivedi and Anurasg Tripathi –Fundamentals of Electrical engineering–Willey Precise.

MOOC / NPTEL/YouTube Links

1. https://nptel.ac.in/courses/108/106/108106172/
2. https://nptel.ac.in/courses/108/106/108106172/
3. https://nptel.ac.in/courses/108/108/108108122/
4. https://nptel.ac.in/courses/108/105/108105053/
5. https://nptel.ac.in/courses/108/105/108105053/
6. https://nptel.ac.in/courses/108/105/108105017/

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEESC103T** Course Name: **Basic Electrical & Electronics Engineering Lab**

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 25 Marks

Prerequisites, if any: Battery, Potential difference and current flow concept, Few basic electrical components identification, Difference between AC & DC circuits, Few basic electronics components identification**.**

Course Objectives: The objective of the course is to

1) **Make** electrical connection for different circuits
2) **Apply** the different laws
3) **Analyse** V-I characteristics of Bridge circuits

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Make** electrical connection for different circuits
CO2	**Apply** the different laws
CO3	**Analyse** V-I characteristics of Bridge circuits
CO4	**Determine** the efficiency of transformer

Course Description: Basic Electrical Engineering course is offered as the engineering science course. This course contains basic knowledge of electrical engineering and its advantages, applications. This course has six units namely i) Analysis of D.C.Circuits , ii) Magnetic circuits, iii) Single phase AC circuits, iv) Three phase AC circuits, v) Single phase Transformer and vi). Fundamentals of electronics

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Assigned Hours
1	Laboratory sessions covering, general introduction to electrical engineering laboratory, experimental setups, Instruments etc. Electrical symbols	02
2	Electric shocks & precautions against shocks	02
3	Study of Ohm's law	02
4	Verification of Kirchhoff's Voltage law & Kirchhoff's Current law	02
5	B-H Curve for magnetic material	02
6	Study of Half wave Rectifier	02
7	Study of Full wave Rectifier	02
8	Determination of Reactance's for series R-L-C circuit	02
9	Demonstration of Power factor Improvement by static capacitor	02

10	Polarity & Ratio test for Single phase Transformer	02
11	Load tests on single phase transformer	02
12	Study of Basic method of Earthing, Use of Fuse & MCB	02
13	Study of different luminaries including Mercury Vapour lamp, fluorescent tube, CFL & LED lamp	02

Learning Resources:

Text Books

4) P.V.Prasad and S.Shivan Raju – Electrical engineering concepts and applications – cenagage learning.
5) B.H.Deshmukh, Electrical engineering concepts and applications
6) Robert L.Boysted and Louis Nashelsky ,Electronics devices and circuit theory – Pearson education

Reference Books

6) B.L.Theraja – Electrical Technology Vol.1.- S.Chand
7) Nagarath I.J. and D.P.Kothari – Basic Electrical Engineering (2001) – Tata McGraw Hill.
8) Bharati Dwivedi and Anurasg Tripathi – Fundamentals of Electrical engineering – Willey Precise.

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEESC104** Course Name: **Basic Civil Engineering**

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 02 Hours/Week	02	ISE: 40 Marks ESE: 60 Marks

Prerequisites, if any:

Course Objectives: The objective of the course is to

4) Learn the brief introduction of all aspects under civil engineering.
5) Understand basic concepts of Surveying, Transportation Engineering.

Course Outcomes: After successful completion of the course, student will be able to

CO1	Illustrate linear and angular measurements by considering principles and significance of Surveying.
CO2	Identify nature of ground by using methods of levelling.
CO3	List components of pavements, railway track and water supply scheme.
CO4	Demonstrate basic knowledge in different fields of Civil Engineering.
CO5	Apply principles of planning, building Bye laws.
CO6	Explain various uses and properties of building materials and also types of loads acting on building.

Course Description:

This course includes principles of building planning, building components and their functions, building materials, surveying and its principles, levelling transportation engineering, irrigation.

Course Content

Unit-1	**Linear and Angular Measurements**	05Hrs

Principles of surveying, Linear measurements- Chain Surveying, Instruments used- Metric chain, errors in chaining, ranging (Direct only)-Instruments Used, nominal scale and R.F., chaining, offsetting & numerical, Angular Measurements- Compass survey, Meridian, bearing and its types, system of bearing, Types of compass: prismatic and surveyor's compass, Calculation of included angles, correction for local attraction, Numerical.

Unit-2	**Levelling**	05Hrs

Terms used in levelling, use of Dumpy level and Auto Level, Temporary adjustments. Methods of reduction of levels, types of levelling, Numerical.

Unit-3	**Introduction of transportation, environment engineering**	03Hrs

Components of rigid and flexible pavement, components of railway track (Broad Gauge), Water Treatment Plant- Components with Flow Diagram

Unit-4	**Introduction to Civil Engineering and Building Planning**	05Hrs
Introduction, branches of civil engineering**,** Relevance of civil engineering in the overall development of the country, Principles of planning, Introduction to Bye-Laws regarding building line, height of building, open space requirements, F.S.I., setbacks, Ventilation, sanitation as per municipal corporation area requirement.		
Unit-5	**Components of Building**	04Hrs
1)Sub-structure: Elements of sub-structures and their Functions of elements **2)Super-structure:** Elements of super-structures and their Functions of elements		
Unit-6	**Building materials and Design**	04Hrs
Building Materials- cement blocks- properties and specification**,** Cement-Types, grades, properties and uses in brief, Concrete-Plain and reinforced cement concrete and ready-mix concrete and their grades, Use and properties of bricks, steel, timber, Use and properties of roofing materials etc.		

Learning Resources:

Text Books

1) Basic Civil Engineering by G. K. Hiraskar, Dhanpat Rai Publication
2) Basic Civil Engineering by S. S. Bhavikatti, New Age International Publications
3) Building Construction by S P Arora & S P Bindra, DhanpatRai Publications

Reference Books

1) Surveying by N. Basak, Tata Mc-Graw Hill Publication
2) Surveying Vol.I, Vol.II, Vol.III by B.C. Punmia, Laxmi Publication
3) Civil Engineering Materials - Technical Teacher's Training Institute, Chandigarh
4) Irrigation Engineering by B. C. Punmia, Dhanpat Rai Publications

MOOC / NPTEL/YouTube Links

1) https://youtu.be/eiVmi6uNcXo?si=zuZRuZICBuDQppm8
2) https://www.youtube.com/live/Y0Y8zuETHOQ?si=IKa6b55t5M9k581d

E Books

1) https://share.google/FC30NwdMCPmF4DqD8

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEESC104T**Course Name: **Basic Civil Engineering Lab**

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 25 Marks

Prerequisites, if any:

Course Objectives:

The objective of the course is to

1) To learn the brief introduction of all aspects under civil engineering
2) To understand basic concepts of Surveying, Transportation Engineering

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Identify and apply** different distance measurement tools
CO2	**Determine** positions of an object by compass
CO3	**Find** the elevations of given points
CO4	**Illustrate** principle of planning

Course Description:

This course includes principles of building planning, building components and their functions, building materials, surveying and its principles, levelling transportation engineering, irrigation.

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Hours
1	Measurement of Distances	2
2	Traversing by Compass	2
3	Reduction of levels by Collimation Plane Method	2
4	Finding out gradient of line by Rise & fall method	2
5	Site visit for study of various construction processes and building planning	2
6	Drawing a line plan of residential building by applying principles of planning	2
7	Drawing sheet showing various building components	2

Learning Resources:

Text Books

1) Basic Civil Engineering by G. K. Hiraskar, Dhanpat Rai Publication
2) Basic Civil Engineering by S. S. Bhavi katti, New Age International Publications
3) Building Construction by S P Arora & S P Bindra, Dhanpat Rai Publications

Reference Books

1) Surveying by N. Basak, Tata Mc-Graw Hill Publication
2) Surveying Vol.I, Vol.II, Vol.III by B.C. Punmia, Laxmi Publication
3) Civil Engineering Materials - Technical Teacher's Training Institute, Chandigarh
4) Irrigation Engineering by B. C. Punmia,Dhanpat Rai Publications

e-Books

1) https://share.google/FC30NwdMCPmF4DqD8

MOOC / NPTEL/YouTube Links

1) https://youtu.be/eiVmi6uNcXo?si=zuZRuZICBuDQppm8
2) https://www.youtube.com/live/Y0Y8zuETHOQ?si=IKa6b55t5M9k581d

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEESC105** Course Name: **Computer Aided Engineering Drawing**

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 03 Hours/Week	02	ISE: 40 Marks ESE: 60 Marks

Prerequisites, if any:
Basic Engineering Drawing Knowledge, Computer Basics, Visualization Ability etc

Course Objectives:
The objective of the course is to

1. Provide the basic knowledge of engineering drawing to visualize the objects.
2. Deliver the basic commands for drawing using AutoCAD.

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Implement** the knowledge of engineering drawing fundamentals, dimensioning and AutoCAD to draw an object.
CO2	**Draw** the neat drawings of straight lines
CO3	**Construct** the neat drawings of planes
CO4	**Classify** Solids and Projection of solids at different Positions.
CO5	**Visualize and construct** orthographic projection to represent in two-dimensional views.
CO6	**Prepare** the objects by developing surfaces of solids with cutting planes.

Course Description:
Computer Aided Engineering Drawing (CAED) introduces students to engineering drawing principles using CAD software, focusing on standardized 2D drafting. The course develops skills in geometric constructions, projections, sections, and dimensioned drawings for engineering applications.

Course Content

Unit-1	Fundamentals of Engineering Drawing and Introduction to Computer Aided Sketching	5 Hours

A. Introduction, Instruments for drawing, sheet sizes, Types of different types of lines, Dimensioning. Construction of regular polygons. Introduction about first and third angle projection method.
B. Introduction to CAD & Graphical user interface of the AutoCAD software, standard tool bars/ menus, navigational tools. Study and use of drawing and modify commands.

Unit-2	Projection of line (1st Angle Projection only)	4 Hours

First angle projection methods, Concept of true line, apparent line, Concept of Projection of lines (Rotating line Method only)

Unit-3	Projection of planes (1st Angle Projection only)	4 Hours

Orthographic projection system, First angle projection methods, Concept of Projection – Projection of planes (regular polygons and circle).

Unit-4	Projections of Solids	4 Hours
Projection of Solids such as Prisms, pyramids, cylinder and cone with their axis inclined to one of the reference planes.(Only rest on HP)		
Unit-5	Orthographic Projections	5 Hours
Orthographic views: Lines used, Selection of views, spacing of views, dimensioning and sections. Required views from given pictorial views (Conversion of pictorial view into orthographic view).Isometric Drawing (Theoretical Treatment only)		
Unit-6	Development of surfaces	4 Hours
Development of Flat and curved lateral surfaces of Regular solids: Prisms, Pyramids, Cylinders and Cones.		

Learning Resources:

Text Books

1) Engineering Drawing by N. D. Bhatt, Charotor Publication House, Bombay
2) Machine Drawing by N. D. Bhatt, Charotor Publication House, Bombay.
3) Engineering Drawing and Graphics Using AutoCAD by T. Jeyapoovan, Vikas Publication.
4) A text book of Engineering Drawing by R. K. Dhawan, S. Chand and Co.

Reference Books

1) Engineering Graphics with AutoCAD - D. M. Kulkarni, A. P. Rastogi, A. K. Sarkar, (PHI) Publisher 2010
2) Machine Drawing by K. L. Narayana, New Age Publication
3) Engineering Drawing by N. B. Shaha and B. C. Rana, Pearson Education.
4) Engineering Drawing by Prof. Amar Pathak, WIELY India Publication.
5) Ajeet Singh, "Machine Drawing includes AutoCAD", Tata McGraw Hill Education

e-Books

1) https://www.perlego.com/book/1558415/engineering-drawing-with-cad-applications-pdf
2) https://link.springer.com/book/10.1007/978-94-011-3074-5

MOOC / NPTEL/YouTube Links

1) **NPTEL – Engineering Drawing and Computer Graphics (IIT Kharagpur)** https://www.nptelprep.in/courses/112105294/videos
2) **NPTEL – Computer Aided Design (CAD)** https://nptel.ac.in/courses/112105061
3) **YouTube – AutoCAD Complete Course for Mechanical Engineering** https://www.youtube.com/live/DDhFBYrPCSI
4) **YouTube – Tikle's Academy (Engineering Drawing & CAED Tutorials)** https://www.youtube.com/@TiklesAcademy

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code:**2501UFYEESC105T** Course Name: **Computer Aided Engineering Drawing lab**

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 25 Marks

Prerequisites:
Basic Engineering Drawing Knowledge, Computer Basics, Visualization Ability etc

Course Objectives: The objective of the course is to

1. Communicate information by graphical means.
2. Understand and read drawing and present the same

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Implement** the knowledge of engineering drawing fundamentals, dimensioning and AutoCAD to draw an object..
CO2	**Draw** the neat drawings of engineering curves, straight lines, Plane, SolidusingAutoCAD
CO3	**Create** orthographic projectionusingAutoCAD
CO4	**Visualize** and develop surfaces of solids usingAutoCAD.

Course Description:
Computer Aided Engineering Drawing Course consists of drawings line, plane and solids using AutoCAD software.

Course Content

Sr. No.	Topic of Practical/Experiment/Tutorial	Hours
1	Draw the projections of lines usingAutoCAD	10
2	Draw the projections of planes usingAutoCAD	8
3	Draw the projections of solids usingAutoCAD	8
4	Imagine and draw the orthographic views usingAutoCAD	8
5	Draw development of the surfaces of the solids usingAutoCAD.	6

Learning Resources:

Text Books

1) Engineering Drawing by N. D. Bhatt, Charotor Publication House, Bombay
2) Machine Drawing by N. D. Bhatt, Charotor Publication House, Bombay.
3) Engineering Drawing and Graphics Using AutoCAD by T. Jeyapoovan, Vikas Publication.
4) A text book of Engineering Drawing by R. K. Dhawan, S. Chand and Co.

Reference Books

1) Engineering Graphics with AutoCAD - D. M. Kulkarni, A. P. Rastogi, A. K. Sarkar, (PHI) Publisher 2010
2) Machine Drawing by K. L. Narayana, New Age Publication
3) Engineering Drawing by N. B. Shaha and B. C. Rana, Pearson Education.
4) Engineering Drawing by Prof. Amar Pathak, WIELY India Publication.
5) Ajeet Singh, "Machine Drawing includes AutoCAD", Tata McGraw Hill Education

e-Books

1) https://www.perlego.com/book/1558415/engineering-drawing-with-cad-applications-pdf
2) https://link.springer.com/book/10.1007/978-94-011-3074-5

MOOC / NPTEL/YouTube Links

1) **NPTEL – Engineering Drawing and Computer Graphics (IIT Kharagpur)** https://www.nptelprep.in/courses/112105294/videos
2) **NPTEL–Computer Aided Design (CAD)** https://nptel.ac.in/courses/112105061

3)**YouTube – AutoCAD Complete Course for Mechanical Engineering** https://www.youtube.com/live/DDhFBYrPCSI

4) **YouTube – Tikle's Academy (Engineering Drawing & CAED Tutorials)** https://www.youtube.com/@TiklesAcademy

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEHSSM106** Course Name: **Communication Skills**

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 01 Hours/Week	01	ISE: 50 Marks

Prerequisites, if any:

1. Basic Knowledge of English Gramma
2. Reading and Listening Comprehension
3. Basic knowledge of Writing Skills

Course Objectives: The objective of the course is to

1. To acquaint students with basic English Grammar and help students in improving language skills
2. To familiarize students with concept, various types, barriers and filters of communication
3. To assist students in developing Vocabulary
4. To aid them in understanding corporate meetings
5. To train the students to compose and write the business letters effectively

Course Outcomes: After successful completion of the course, student will be able to

CO1	Understand basic concepts of grammar in application letters
CO2	Understand communicative techniques to participate in several activities
CO3	Recall appropriate vocabulary for various contexts
CO4	Demonstrate interpersonal skills with precision and competence in different scenario
CO5	Write business letters by using appropriate language tools

Course Description:

English is the main language of communication in industry and global employment. This course develops essential grammar, vocabulary, communication skills, and business correspondence needed by engineering students for professional use.

Course Content

Unit-1	**Ice Breaking and Rapid Review of Grammar**	03 Hrs

- Knowing each other and Self Introduction
- Basic application letters (Applications for various occasions etc.)
- Parts of Speech
- Types of Sentences, Tenses / Verbal forms

Unit-2	**Introduction to Communication and it' s Organization**	04 Hrs

- Nature, Importance and Process of Communication
- Basic Types: Verbal- Non- Verbal Communication
- Nature of Communication. -Formal & Informal
- Directions of Communication
- Levels of Communicatio**n**
- Barriers & Filters to Communication

Unit-3	**Vocabulary Building**	02 Hrs
• Synonyms & Antonyms, Prefixes and Suffixes • Words often Confused: Homonym & Homophone • Idioms and Phrases		
Unit-4	**Corporate Meetings**	02 Hrs
• Significance and Types of Meeting • Strategies of Conducting and Attending Meeting Effectively • Record Keeping: Notice, Agenda and Minutes		
Unit-5	**Business Correspondence**	03 Hrs
• Importance of Correspondence & Elements of Letter Writing • Structure or Layouts (American & British) • Letters: Inquiry, Order Placement, Complaint and its Adjustment, Invitation Letter		

Learning Resources:

1) Communication Skills Meenakshi Raman and Sangeeta Sharma Oxford University Press1st Edition, 2016
2) Communication Skills for Engineers S. Mishra & C. Muralikrishna, Pearson
3) Basic Communication Skills for Technology Andrea J. Rutherford Pearson Education Asia, Delhi, 2002
4) Mastering Communication Nicky Stanton Palgrave Master Series
5) Speaking Effectively: Developing Speaking Skills for Business English Jeremy Comfort, et al.Cambridge University Press Reprint, 2011
6) Basic Correspondence and Report Writing: A Practical Approach to Business and Technical Communication, R. C. Sharma and Krishna Mohan Tata McGraw-Hill Publishing Co. Ltd., India, 5th Edition, 2017
7) Written Communication in English Saran Freeman Orient Longman
8) The Oxford Guide to Writing and Speaking J. Seely Oxford University Press, India 3rd Edition, 2013
9) High School English Grammar and Composition, Wren and Martin, Blackie, 2000
10) Essential English Grammar (Elementary & Intermediate) Raymond Murphy Cambridge University Press (CUP)
11) English Language Laboratories, Nira Konar, PHI Learning 2014

e-Books

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ncert.nic.in/vocational/pdf/kees101.pdf

chrome extension://efaidnbmnnnibpcajpcglclefindmkaj/https://baou.edu.in/assets/pdf/BCADES_201_slm.pdf

MOOC / NPTEL/YouTube Links

https://www.youtube.com/results?search_query=introduction+in+english

https://www.youtube.com/watch?v=zAIt3VbkL6g

https://www.youtube.com/watch?v=0l69KEx7GQo

https://www.youtube.com/watch?v=smgyeUomfyA

https://www.youtube.com/watch?v=GY3ADgnWLos

https://www.youtube.com/watch?v=yRwmr7CqnrY

https://www.youtube.com/watch?v=eIho2S0ZahI

www.mindtools.com

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEHSSM106T** Course Name: **Communication Skills Lab**

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 25 Marks

Prerequisites, if any:

1.Basic Knowledge of English Gramma
2.Reading and Listening Comprehension
3.Basic knowledge of Writing Skills

Course Objectives:

The objective of the course is to

1) To acquaint students with basic English Grammar and help students in improving language skills
2) To assist students in developing Vocabulary and phonetic drill
3) To aid them in understanding corporate meetings
4) To train the students to compose and write the business letters effectively

Course Outcomes: After successful completion of the course, student will be able to

CO1	To formulate grammatical sentences correctly and apply communicative techniques effectively
CO2	Understand and use vocabulary effectively
CO3	Display standard writing skills while composing business letters and report preparation

Course Description:

This course is designed to help the students to practice the correct grammatical structures and use the relevant vocabulary while reading and writing. Also give them practical experience of corporate meetings, Phonetics, Intonation and articulation Drill. Similarly provide them with basic structure and lay out of report writing & business correspondence.

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Hours
1	Ice breaking: Introducing Yourself, star of my life	02
2	Practice on writing General Applications	02
3	Grammar Activities	02
4	Vocabulary Building Exercises	02
5	Vocabulary Building Exercises	02
6	Conducting & Attending Meeting	
7	Conducting & Attending Meeting	
8	Practice on Business Correspondence	

Learning Resources:

Reference Books

1) Communication Skills Meenakshi Raman and Sangeeta Sharma Oxford University Press1st Edition, 2016
2) Communication Skills for Engineers S. Mishra & C. Muralikrishna, Pearson
3) Basic Communication Skills for Technology Andrea J. Rutherford Pearson Education Asia, Delhi, 2002
4) Mastering Communication Nicky Stanton Palgrave Master Series
5) Speaking Effectively: Developing Speaking Skills for Business English Jeremy Comfort, et al.Cambridge University Press Reprint, 2011
6) Basic Correspondence and Report Writing: A Practical Approach to Business and Technical Communication, R. C. Sharma and Krishna Mohan Tata McGraw-Hill Publishing Co. Ltd., India, 5th Edition, 2017
7) Written Communication in English Saran Freeman Orient Longman
8) The Oxford Guide to Writing and Speaking J. Seely Oxford University Press, India 3rd Edition, 2013
9) High School English Grammar and Composition, Wren and Martin, Blackie, 2000
10) Essential English Grammar (Elementary & Intermediate) Raymond Murphy Cambridge University Press (CUP)
11) English Language Laboratories, Nira Konar, PHI Learning 2014

e-Books

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ncert.nic.in/vocational/pdf/kees101.pdf
chrome extension://efaidnbmnnnibpcajpcglclefindmkaj/https://baou.edu.in/assets/pdf/BCADES_201_slm.pdf

MOOC / NPTEL/YouTube Links

https://www.youtube.com/results?search_query=introduction+in+english
https://www.youtube.com/watch?v=zAIt3VbkL6g
https://www.youtube.com/watch?v=0l69KEx7GQo
https://www.youtube.com/watch?v=smgyeUomfyA
https://www.youtube.com/watch?v=GY3ADgnWLos
https://www.youtube.com/watch?v=yRwmr7CqnrY
https://www.youtube.com/watch?v=eIho2S0ZahI
www.mindtools.com

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B. Tech)

Course Code: **2501UFYECC107T** Course Name: **Cyber Security Lab**

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 50 Marks

Prerequisites, if any: 1) Fundamental knowledge of Computer
2) Fundamental knowledge of Mobile Application.
3) Awareness of internet.

Course Objectives:
The objective of the course is to Study how to report Cyber Crime, phishing emails, secure net banking, VAPT Audit format.

Course Outcomes: After successful completion of the course, student will be able to

CO1	Understand different Cyber Crimes.
CO2	Understand phishing Emails.
CO3	Apply authentication methods.
CO4	Understand VAPT Audit.

Course Description:
Course deals with understanding of different types of Cyber Security, Cyber Crime.

Course Content

Sr. No.	Topic of Practical/Experiment/Tutorial	Hours
1	Introduction to Cyber Security	02
2	Checklist for reporting Cyber Crime at Cyber Crime Police Station.	02
3	Checklist for reporting Cyber Crime online.	02
4	Reporting phishing emails. (Spoofing, Phishing)	02
5	Setting and configuring two factor authentications in the Mobile phone	02
6	Checklist for secure net banking.	02
7	Basic checklist, privacy and security settings for popular Social media platforms.	02
8	Configuring security settings in Mobile Wallets and UPIs	02
9	Checklist for reporting Mobile stolen/ lost, file complaint on www.ceir.gov.in	02
10	VAPT Audit format.	02

Learning Resources:

Text Books

1) "Introduction to Cyber Security" by Anand Shinde
2) "Cyber security Fundamentals: A Real-World Perspective" by Kutub Thakur and Al Sakib Khan Pathan
3) "Cyber security Fundamentals: A Real-World Perspective" by Kutub Thakur and Al Sakib Khan Pathan

Reference Books

1) Cyber Crime Impact in the New Millennium, by R. C Mishra , Auther Press. Edition 2010.
2) Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
3) Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd
4) Fundamentals of Network Security by E. Maiwald, McGraw Hill.

e-Books

1) "Cyber security: A Beginner's Guide" by Dr. Darshanaben Dipakkumar Pandya et al

MOOC / NPTEL/YouTube Links

1) Introduction to Cyber Security(NPTEL) By Prof Jeetendra Pande. Focuses on cyber ethics, personal safety, and basic awareness.
2) Cyber Security and Privacy (NPTEL)
3) Google Cyber security Professional Certificate (Coursera): Highly recommended for foundation nal skills, including network security and Python.

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEVSEC108T** Course Name: **Manufacturing Technique Lab**

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 50 Marks

Prerequisites, if any:

1) General safety Measures should be taken.
2) Safety rules regarding each machine or equipment should be followed
3) Use of Personal protective equipment.

Course Objectives:

The objective of the course is to

1) Develop a skill in dignity of labour, precision, safety at work place, team working and development of right attitude
2) Acquire skills in basic engineering practice
3) Develop general machining skills in thestudents and develop small products

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Use** the techniques, skills, and modern engineering tool snecessaryin smithy welding and sheet metal working and apply them practically.
CO2	**Learn** thetechniques, skills, and modern engineering tools necessary for fitting and carpentry operations and Possess knowledge of measurement and measuring nstrument.
CO3	**Demonstrate** proficiency in using various tools to complete small products , enhancing precision fitting & assembly skills for fabricating components.

Workshop practice is the backbone of the real industrial environment which helps to develo pp and enhance relevant technicalh and skills required by the technician working in the Various **engineering** industries and workshops.

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Hours
1	Safety precautions while working in workshop .Introduction to tools	02
2	Introduction to smithy operation slike, bending, forming upsetting, drawing Smithy tools hammer, hot & cold chisel flatters, tongs, anvil etc, Preparation of job as per The drawing	02
3	Preparation of smithy job as per drawing	02
4	Types of welding likes Gas Welding, arc welding, Welding equipment 's, welding of various metals electrodeclassificationandcoding,weldingjoints,andpreparationofweldingcomponent.	02
5	Preparation of welding job as per drawing	02
6	Specifications of metal sheets working tools, sheet metal and operations, and prepare the job as per drawing.	02
7	Preparation of sheet metal component as per drawing.	02
8	Preparation of sheet metal component as per drawing.	02
9	Study of various tools, files, Drills, Taps, Die&Fitting operations to complete small production fitting shop	02
10	Operations to develop small product.	02

Learning Resources:

1 Elements of Workshop Technology, Vol– I by Hajara Chaudhari, Media Promoters

Reference Books

1) Workshop Technology, Vol– I by Gupta and Kaushik New Heights.
2) Workshop Technology, Vol–I by Chapman The English Language Book Society
3) Workshop Technology, Vol.-I by H.S. Bawa, TMH Publications, NewDelhi

MOOC / NPTEL/YouTube Links

WebLinks/VideoLecturesaretobeprovidedtoTheoryandPractical/Experiments

Practical1.http://nptel.ac.in/courses/

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEMAC109A** Course Name: **Democracy, Elections and Good Governance**

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 00 Hours/Week	00	ISE: 00 Marks ESE: 0 Marks

Prerequisites, if any: Student should have completed 12th grade in any stream.

Course Objectives:

The objective of the course is

1) To make the pupils aware of the importance of democracy. What constitutes democracy, what is its importance from the point of view of the role of individual and what exactly can an individual get if he performs his role well in the society.
2) To make the individual understand the different aspects of democracy and its implications in the overall development of the state.
3) To help students, upon entering the college, enrol themselves as voters and encourage and enthuse other members of the society to participate not only in election process but also electoral and political process in general.

Course Outcomes: After successful completion of the course, student will be able to

CO1	The rationale of the study is to make the pupils aware of the importance of democracy. What constitutes democracy
CO2	The rationale of the study is to make the pupils aware of the importance of democracy. What constitutes democracy
CO3	The rationale of the study is to make the pupils aware of the importance of democracy. What constitutes democracy

Course Description:

Democracy, Elections and Good Governance is non-credit, self-study audit course. A separate examination of 50 marks will be conducted at the end of the semester. Student must score minimum 40% (20M) marks in the examination.

Course Content

Unit-1	**Democracy in India**	

Dimensions of Democracy: Social, Economic and Political, Decentralization: Grass root Level Democracy– Challenges before Democracy: women and marginalized sections of the society

Unit-2	**Election to Local Self Government Bodies**	

73rd and 74th Constitutional Amendment Acts: Institutions at the local level and Role of State Election commission, Local Body Elections: Urban & Rural, Duties of an Individual towards electoral process

Unit-3	**Good Governance**	
Meaning and concept, Government and Governance, Good Governance initiatives in India.		
Learning Resources:		
Reference Books 5) **Democracy, Elections and Good Governance in India** by Rede G. D., Rohit S. Shelar, Jyoti Chaudhary & Saurav Singl 6) __ **Indian Polity by** *M. Laxmikanth* 7) __ **Democracy and Governance in India by** Subhash C. Kashyap 8) __ **Good Governance: Concepts and Approaches** by Dr. B. L. Fadia & Kuldeep Fadia		

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y.B.Tech)

Course Code:2501UFYEBSC110 Course Name:Engineering Chemistry

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 03 Hours/Week	03	ISE: 40 Marks ESE: 60 Marks

Prerequisites, if any:
1)Students should have knowledge about basic chemistry related to periodic table, chemical bonding, metals and non metals.
2) Basic concepts of reaction mechanism and state of matter.
3) Basic concepts offuelandcorrosion.

Course Objectives: The objective of the course is to

1) Developaninterestamongthestudentsregardingappliedandengineeringchemistry.
2) Studythedifferentwaterqualityparametersand itsapplicationsinengineeringfield.
3) Apply the instrumental methods for analysis of different chemical substances.
4) Analyzecharacteristicsoffuels and use proper material for engineering application.
5) Apply the appropriate method to prevent corrosion.
6) Understand basic concepts of phase.

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Use** relevant water treatment process to solve industrial problems.
CO2	**Illustrate** the analytical instrumental techniques for chemical analysis.
CO3	**Select** relevant engineering materials for applications.
CO4	**Select** proper fuels for domestic and industrial use.
CO5	**Use** corrosion preventive measures in domestic and industrial application.
CO6	**Explain** phase and chemical equilibrium.

Course Description:
This course aims to impart fundamental knowledge of instrumental methods, engineering materials (composite, polymer), phase rule and applied knowledge of water purification methods, fuel and prevention techniques of corrosion, this will help the students to select and use relevant materials and methods which will be economical and eco-friendly.

Course Content

Unit1	**Water** Introduction, Impurities in natural water, Water quality parameters, Hardness ofwater, Types of hardness, Units of hardness. Ill effects of hard water in steamgeneration in boilers – Sludge & Scale formation. Numericalonhardness,treatmentofhardwater-ionexchangeandreverseosmosis	07 Hrs
Unit2	**Instrumental methods of chemical analysis** Introduction of instrumental methods,	06 Hrs

	Spectrometry:Introduction, Laws of spectrometry Lamberts law and Beer–Lambert's law, Single beam spectrophotometer – schematic, working and applications. Chromatography: Introduction, types, gas – Liquid Chromatography (GLC) – basic principle, instrumentationandapplications. Advantages and disadvantages of instrumental methods.	
Unit3	**Engineering materials** Macromolecules: Polymers: Introduction, Polymerization reactions – Addition and condensation polymerization, Plastics – industrially important plastics Poly vinyl chloride, Phenol formaldehyde, Urea formaldehyde & Epoxy resin, Conducting polymers Composite materials Introduction, Composition, Properties and Uses of Fiber reinforced plastics (FRP) and Glass reinforced plastic(GRP)	07 Hrs
Unit4	**Fuels** Introduction, Definition, Classification, Properties of fuels. Characteristics ofgood fuels, Comparison between solid,liquid and gaseousfuels, Calorificvalue(higherandlower),BombcalorimeterandBoy'scalorimeter.NumericalonBombandBoy'scalorimeter Fuel Cells:Definition, Classification of fuel cells, Working of Solid oxide fuelcell(SOFC),Limitationsandapplications offuelcells.	07 Hrs
Unit 5	**Corrosion and it's Prevention** Introduction, Causes, Classification, Factors affecting rate of corrosion, Corrosion prevention methods – Proper design and material selection, Catholic protection, Protective coatings – Metallic coatings such as Hot dipping – Galvanizing and Tinning , Electroplating , Metal Spraying.	07 Hrs
Unit6	**Chemical Equilibrium** Introduction, Heterogeneous equilibrium, Mathematical statement of phase Rule, Terminology, Phase diagram, One component system example – Water system. Two component system example – lead - silver, Applications and Limitations of phase rule.	05 Hrs

Learning Resources:

Text Books

1.TextbookofEngineering ChemistrybyS.S.Daraand S.S.Umare,S.Chandand CompanyLit.,NewDelhi

2. TextbookofEngineeringChemistrybyShashiChawla,DhanpatRai&Co.(Pvt.)Lit,Delhi

3. TextbookofEngineering ChemistrybyDr.Mrs.JayshreeParikh,Tech-MaxPublicationPune.

Reference Books

1.Engineering Chemistry by Jain and Jain, Dhanpat Rai Publishing Company Ltd., New Delhi.

2.A Textbook of Engineering Chemistry by C. P. Murthy, C. V. Agarwal and A. Naidu, BS Publications, Hyderabad

3.Instrumental Methods of Chemical Analysis by Chatwaland Anand, Himalaya Publishing House, New Delhi

4.Engineering Chemistry by Renu Bapna and Renu Gupta, MacMillan Publishers (India) Ltd,Delhi.

5.Engineering Chemistry by Dr. A. K. Pahari and Dr. B. S. Chauhan, Laxmi Publications (P) Ltd, New Delhi.

e-Books

1) TextbookofEngineeringChemistrybyShashiChawla,DhanpatRai&Co.(Pvt.)Lit,Delhi
2) TextbookofEngineering ChemistrybyS.S.Daraand S.S.Umare,S.Chandand CompanyLit.,NewDelhi
3) Engineering Chemistry by Jain and Jain, Dhanpat Rai Publishing Company Ltd., New Delhi.

MOOC / NPTEL/YouTube Links

1.https://www.researchgate.net/publication/343294128_Water_Quality_Parameters
https://nptel.ac.in/courses/105104102

2.https://archive.nptel.ac.in/courses/102/107/102107028/

3.https://onlinelibrary.wiley.com/journal/2365709X
https://nptel.ac.in/courses/113/105/113105057/

4.https://www.energy.gov/eere/fuelcells/types-fuel-cells
http://www.nptelvideos.in/2012/11/engineering-chemistry-1.html

5.https://www.electrochem.org/corrosion-science/
https://nptel.ac.in/courses/113/108/113108051/

6.https://www.britannica.com/science/phase-rulehttps://nptel.ac.in/courses/113/104/113104068/
http://www.nitttrc.edu.in/nptel/courses/video/112104248/L17.html

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y.B.Tech)

Course Code: 2501UFYEBSC110T **Course Name: Engineering Chemistry Lab**

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 25 Marks

Prerequisites, if any:

1. Students should have knowledge about basic chemistry related to periodic table, chemical bonding, metals and non metals.
2. Basic concepts of reaction mechanism and state of matter.
3. Basic concepts offuelandcorrosion.

Course Objectives:

The objective of the course is to ,

1) Developaninterestamongthestudentsregardingappliedandengineeringchemistry.
2) Studythedifferentwaterqualityparametersand itsapplicationsinengineeringfield.
3) Apply the instrumental methods for analysis of different chemical substances.
4) Analyzecharacteristicsoffuels and use proper material for engineering application.
5) Apply the appropriate method to prevent corrosion.
   Understand basic concepts of phase.

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Use** relevant water treatment process to solve industrial problems.	
CO2	**Illustrate** the analytical instrumental techniques for chemical analysis.	
CO3	**Select** relevant engineering materials for applications.	
CO4	**Select** proper fuels for domestic and industrial use.	
CO5	**Use** corrosion preventive measures in domestic and industrial application.	
CO6	**Explain** phase and chemical equilibrium.	

Course Description:

This course aims to impart fundamental knowledge of instrumental methods, engineering materials (composite, polymer), phase rule and applied knowledge of water purification methods, fuel and prevention techniques of corrosion, this will help the students to select and use relevant materials and methods which will be economical and eco-friendly.

Course Content

Sr. No.	Topic of Practical/Experiment/Tutorial	Assigned Hours
1	Determination of acidity of water	2
2	Determination of total alkalinity of water sample.	2
3	Determination of chloride content of water by Mohr's method.	2
4	Determination of temporary and permanent hardness of water sample by EDTA method.	2

5	Determination of moisture content in a given coal sample by proximate analysis	2
6	Determination of volatile content in a given coal sample by proximate analysis	2
7	Determination of ash content in a given coal sample by proximate analysis	2
8	Preparation of urea-formaldehyde resin	2
9	Preparation of phenol-formaldehyde resin	2
10	Determination of percentage of copper in brass by iodometry.	2
11	Estimation of zinc in brass solution	2
12	Determination of rate of corrosion of aluminium by weight loss method in acidic and basic medium	2
13	Determination of amount of copper present in unknown sample by colorimeter	2
14	Demonstration of paper chromatography	2

**Suggested list of practicals is given in the above table. Students need to perform minimum 10 practicals to fulfill the ISA evaluation.*

Learning Resources:

Text Books

1.TextbookofEngineering ChemistrybyS.S.Daraand S.S.Umare,S.Chandand CompanyLit.,NewDelhi

2. TextbookofEngineeringChemistrybyShashiChawla,DhanpatRai&Co.(Pvt.)Lit,Delhi

3. TextbookofEngineering ChemistrybyDr.Mrs.JayshreeParikh,Tech-MaxPublicationPune.

Reference Books

1.Engineering Chemistry by Jain and Jain, Dhanpat Rai Publishing Company Ltd., New Delhi.

2.A Textbook of Engineering Chemistry by C. P. Murthy, C. V. Agarwal and A. Naidu, BS Publications, Hyderabad

3.Instrumental Methods of Chemical Analysis by Chatwaland Anand, Himalaya Publishing House, New Delhi

4.Engineering Chemistry by Renu Bapna and Renu Gupta, MacMillan Publishers (India) Ltd,Delhi.

5.Engineering Chemistry by Dr. A. K. Pahari and Dr. B. S. Chauhan, Laxmi Publications (P) Ltd, New Delhi.

e-Books

1) TextbookofEngineeringChemistrybyShashiChawla,DhanpatRai&Co.(Pvt.)Lit,Delhi
2) TextbookofEngineering ChemistrybyS.S.Daraand S.S.Umare,S.Chandand CompanyLit.,NewDelhi
3) Engineering Chemistry by Jain and Jain,Dhanpat Rai Publishing Company Ltd., New

Delhi.

MOOC / NPTEL/YouTube Links

VLab Link:

1. **Experimentname-**DeterminationofViscosity(**LabName-**Viscosityvirtuallab) http://vlab.amrita.edu/?sub=2&brch=190&sim=339&cnt=1
2. **Experiment name-**Water Analysis-Physical Parameter(**Lab Name-** InorganicChemistry virtual lab) http://vlab.amrita.edu/?sub=2&brch=193&sim=575&cnt=1
3. **Experiment name-**Water Analysis-Chemical Parameter(**Lab Name-** Inorganic Chemistry virtual lab) http://vlab.amrita.edu/?sub=2&brch=193&sim=1548&cnt=1
4. **Experimentname-**AcidBaseTitration(**LabName-**InorganicChemistryvirtual lab) http://vlab.amrita.edu/?sub=2&brch=193&sim=352&cnt=1
5. **Experimentname-**SoilAnalysis(**LabName-**InorganicChemistryvirtuallab) http://vlab.amrita.edu/?sub=2&brch=193&sim=1549&cnt=1
6. **Experiment name-** Alloy Analysis (Brass) (**Lab Name –** Inorganic Chemistryvirtual lab) http://vlab.amrita.edu/?sub=2&brch=193&sim=1255&cnt=1
7. **Experiment name –** Spectrophotometry (Physical Chemistry virtual lab) http://vlab.amrita.edu/?sub=2&brch=190&sim=338&cnt=1

Tatyasaheb Kore Institute of Engineering and Technology

First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEPCC111** Course Name: **Computer Programming in C**

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 02 Hours/Week	02	ISE: 40 Marks ESE: 60 Marks

Prerequisites, if any:

1. Basic knowledge of Computers.
2. Computational Mathematics.

Course Objectives: The objective of the course is to

1. Understand the basics of problem solving techniques
2. Provide an insight into structured programming constructs in C
3. Give details of modular programming

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Define** algorithm, flowchart and implementing programs in C- languages
CO2	**Select** appropriate operators in programming expressions for implementing simple C- Programs.
CO3	**Explain** Decision Making and Branching statements for implementing Programs.
CO4	**Illustrate** appropriate looping statements for implementing Programs.
CO5	**Develop C** programming language for applications of 1-D and 2-D Arrays.
CO6	**Make use of** modular programming using functions in C-Language.

Course Description:

This Course is designed to build programming skills in First year B.Tech students. The programming skills will be helpful to all branches of Engineering.

Course Content		
Unit-1	**Basics of C programming**	04 Hrs
Basics of programming: Program development steps, Algorithms / Pseudo code, flowchart, History and Importance of C, Structure of C- Program, A sample C programs, Keyword and Identifier, Basic data types and sizes, Constants		
Unit-2	**Operators and Expressions in C**	04 Hrs
Introduction, Arithmetic Operators, Relation Operator, Logical Operator. Assignment Operators, Increment and Decrement Operators, Conditional Operator , Bitwise Operator, Special Operators, Arithmetic Expressions , Evaluation of Expressions, Precedence of Arithmetic Operators, Some Computational Problems .		
Unit-3	**Decision Making and Branching Statements**	04 Hrs
Decision Making and Branching : Introduction, Decision Making with IF Statement, Simple if Statement,if. Else Statement, Nested if....else Statement ,else...if Ladder, Switch statement, The?: Operator, The goto statement. Example programs		
Unit-4	**Decision Making and Looping**	04 Hrs
Introduction, while statement, do-while statement, for statement: Simple loop, Additional feature of for loop, Nesting of for loop, jumps in loops, break and continue. Example programs.		
Unit-5	**Arrays**	04 Hrs
Introduction, Definitions of Array, Assigning and Entering value to an array, Accessing array elements/ Read data from an Array, Array Elements in Memory, 1-Dimensional, 2-Dimensional, and Programs on Array operations, basic operations on		

matrices.

Unit-6	User Defined Function	04 Hrs

Introduction, Need for User-defined functions, A multifunction program/Modular program, Prototype of Function/Function Declaration ,Definition/ Implementation of Functions, Return Values and their types, Function Calls, Category of function, Function Arguments: Call by Value. Example programs.

Learning Resources:

Text Books

1) C the Complete Reference by Herbert Schild (Tata McGraw Hill) 4th Edition.
2) The C Programming Language- Brian W. Kernighan, Dennis Ritchie 2nd Edition.

Reference Books

1) E. Balaguruswamy, "Programming in ANSI C", Tata McGraw Hill, 5th edition,2010.
2) Let Us C By Yashavant P. Kanetkar, 5th Edition.

e-Books

1) Programming in ANSI C" – E. Balagurusamy
2) The C Programming Language" – Brian W. Kernighan & Dennis M. Ritchie

MOOC / NPTEL/YouTube Links

1) NPTEL – Programming in C (IIT Kanpur / IIT Kharagpur)
2) YouTube – Neso Academy (C Programming Playlist)

Tatyasaheb Kore Institute of Engineering and Technology

First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code:**2501UFYEPCC111T** Course Name: **Computer Programming in C Lab**

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical 02 Hours/Week	01	ISA: 25 Marks

Prerequisites, if any:

1. Basic knowledge of Computers.
2. Computational Mathematics.

Course Objectives: The objective of the course is to

1. To understand basic programming concepts using the C language.
2. To gain hands-on experience in writing, compiling, and debugging C programs.
3. To develop logical thinking and problem-solving skills for engineering applications.

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Define** algorithm, flowchart and implementing programs in C language.
CO2	**Select** appropriate operators in programming expressions for implementing simple C programs.
CO3	**Explain** decision making and branching statements for implementing programs.
CO4	**Illustrate** appropriate looping statements for implementing programs.
CO5	**Develop C** programming language for applications of 1-D and 2-D arrays.
CO6	**Makeuse of** modular programming using functions in C language

Course Description:

This Course is designed to build programming skills in First year B.Tech students. The programming skills will be helpful to all branches of Engineering. The student will learn basic programming concepts from declaring a

variable, conditional statements, looping to the concepts of arrays

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Hours
1	Write a Program to Demonstrate how to read and display the value in all Basic data type variables. Example:WAP to display the details of the Student Like: 1. Roll_No of Student 2. Division of Student 3. Height and Weight of Student.	2 Hrs
2	Write a C Program to demonstrate the working of Arithmetic operations using arithmetic operators in C.	2 Hrs
3	Write a C Program to do the following using relational operators and branching statement: a. Read two integers and check if they are equal or not. b. Print the greater of Two numbers.	2 Hrs
4	Write a Program to enter student marks through keyboard and find grade using the conditional operator. grades are 1. Honor- 90 above 2. Distinction-80 to 89 3. Grade A+ - 70 to 79 4. Grade A - 60 to 69 5. Grade B - 50 to 59 6. Pass Grade - 40 to 49 Fail - Below 40	2 Hrs
5	Write a C Program to demonstrate Switch Statement and Constant Variable by finding the area of Circle, Rectangle, Square and Triangle considers each as a different case.	2 Hrs
6	Write a C Program to demonstrate looping statements. a. Find the Factorial by given a number. b. Count total number of digits for a given integer number. c. Find the Sum of Digits in a given number. Reverse the given integer number and display the same on the output screen.	2 Hrs

7	Write a C program to read N numbers in an integer array and Print it in reverse order.	2Hrs
8	Write a C program to read N numbers in an array and display the sum of array elements.	2Hrs
9	Write a program to read two matrices and store the addition Of two matrices in the third matrix.	2Hrs
10	Write a C Program to swap two numbers using call by value.	2Hrs

Learning Resources:

Text Books

1) C the Complete Reference by Herbert Schild (Tata McGraw Hill) 4th Edition.
2) The C Programming Language- Brian W. Kernighan, Dennis Ritchie 2nd Edition.

Reference Books

1) E. Balaguruswamy, "Programming in ANSI C", Tata McGraw Hill, 5th edition, 2010.
2) Let Us C By Yashavant P. Kanetkar, 5th Edition.

e-Books

1) "Programming in ANSI C" – E. Balagurusamy
2) The C Programming Language" – Brian W. Kernighan & Dennis M. Ritchie

MOOC / NPTEL/YouTube Links

1) NPTEL – Programming in C (IIT Kanpur / IIT Kharagpur)
2) YouTube – Neso Academy (C Programming Playlist)

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEESC112** Course Name: **Engineering Mechanics**

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 02 Hours/Week	02	ISE:40 Marks ESE:60 Marks

Prerequisites, if any: Learner should knowsecondaryschoolmathematics. Learnersshouldknowthe"Mechanics"sectionfromPhysics also Students should know Newton's Laws of Motion, force, mass, acceleration

Course Objectives: The objective of the course is to

1) Understand the vector mechanics
2) Visualize concept of equilibrium and its Imaginary existence.
3) Apply equilibrium conditions for Various Cases.
4) Find support reactions of beams

Course Outcomes: After successful completion of the course, student will be able to

CO1	Analyze a system of forces, compute resultant force and moment.
CO2	Draw correct free body diagrams and determine reaction forces at supports.
CO3	Solve for support reactions on simply supported beams under various loading.
CO4	Determine the centroids and centres of gravity of standard and composite shapes
CO5	Compute area moments of inertia and radii of gyration using first principles, parallel & perpendicular axis theorems.
CO6	Analyse collisions / impacts of rigid bodies (elastic, inelastic) using momentum and energy principles.

Course Description: This course is designed to provide basic understanding about the different types of forces, moments and their effects on structural elements, which will analyse different structural systems. Students should get enough knowledge about equilibrium condition, in which entire stability depends.

Course Content

Unit-1	**FundamentalsofStatics**	05
Basic Concepts and Fundamental Laws, Force, System of Forces, Resultant, Equilibrant, Resolution and Composition of Forces, Moment and Couple, Varignon's Theorem, Law of Moments		
Unit-2	**Equilibriumof Forces**	05
Basicconcept ofequilibrium,Equilibriumconditions, Lami's Theorem,FreeBodyDiagram,Equilibriumofspheres.		
Unit-3	**EquilibriumofBeams**	04
TypesofLoads,Typesofsupports, types of beam, AnalysisofSimplebeams,Supportreactions.		
Unit-4	**Centroid**	05
Centroid and Centre of Gravity, Centroid of Standard shapes, Numerical on centroid of given diagram		
Unit-5	**Moment ofInertia**	05
Moment ofInertiaofStandardshapesfrom firstprinciple,Parallelandperpendicularaxistheorem,MomentofInertiaofplainandcompositefigures,RadiusofGyration		

Unit-6	**Impactand Collisionofelasticbodies**	04

Impact,Types of Impact, Law of conservation of Momentum, Coefficient of Restitution ,Numericalon Direct central Impact and Impact on fixed plane.

Learning Resources:

Text Books

1) Engineering Mechanics by R. S. Khurmi, S. Chand Publications.
2) Engineering Mechanics by R. K. Bansal and Sanjay Bansal
3) Engineering Mechanics by S. S. Bhavikatti, New Age International Pvt. Ltd
4) Engineering Mechanics by D.P.Sharma, Pearson Education

Reference Books

1)Engineering Mechanics by Manoj K Harbola, Cengage Learning
2)Vector Mechanics for Engineers Vol.I and II by F. P. Beer and E. R. Johnston, Tata Mc -Graw Hill
3)Engineering Mechanics by K. I. Kumar, Tata Mc -Graw Hill Publication
4)Engineering Mechanics by Irving H. Shames, Prentice Hall of India, New Delhi.
5)Fundamentals of Engineering Mechanics by S. Rajasekaran, G. Sankarasubramanian, Vikas Publishing House

e-Books

1)https://www.dbooks.org/engineering-mechanics-statics-5669311255/?utm_source=chatgpt.com

MOOC / NPTEL/YouTube Links

1	https://www.youtube.com/watch?v=nGfVTNfNwnk
2	https://www.youtube.com/watch?v=nkg7VNW9UCc
3	https://www.youtube.com/watch?v=6u_rjLjv-MY
4	https://www.youtube.com/watch?v=Fudcc0JoXdo
5	https://www.youtube.com/watch?v=ljDIIMvx-eg
6	https://www.youtube.com/watch?v=aiT5mcuXf5Y

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code **2501UFYEESC112T** Course Name **Engineering Mechanics Lab**

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 25 Marks

Prerequisites, if any: Learners should know secondary school mathematics
Learners should know the "Mechanics" section from Physics.

Course Objectives: The objective of the course is to

1) Understand the vector mechanics.
2) Visualize concept of equilibrium and its imaginary existence.
3) Apply equilibrium conditions for various cases.
4) Find support reactions of beams

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Determine**theresultantofconcurrentcoplanarforcesystemgraphically.
CO2	**Analyze**theforcethegivenforcesystem.
CO3	**Verify**thelaw ofmomentofgivenforcesystem.
CO4	**Determine**thesupportreactionsofthegivenbeam.

Course Description:
This course is designed to provide basic understanding about the different types of forces, moments and their effects on structural elements, which will analyze different structural systems. Students should get enough knowledge about equilibrium condition, in which entire stability depends.

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Hours
1	Lawofpolygonofforces	02 Hrs
2	Jibcrane	02 Hrs
3	Bellcranklever	02 Hrs
4	SupportReactionsofBeam	02 Hrs
5	TofindResultantbyGraphicalMethod	02 Hrs
6	TofindSupportReactionsbyGraphicalMethod	02 Hrs
7	Assignmentonfinding Resultant	02 Hrs
8	AssignmentonEquilibriumofSphere	02 Hrs
9	AssignmentonFindingsupportreactionsofbeam	02 Hrs
10	AssignmentonfindingCentroid ofgivenshape	02 Hrs
11	Assignmenton findingMomentofInertiaofgivenshape	02 Hrs
12	Assignmentonimpact ofelasticbodies	02Hrs

Learning Resources:

Text Books

1) Engineering Mechanics by R. S. Khurmi, S. Chand Publications.
2) Engineering Mechanics by R. K. Bansal and Sanjay Bansal

Engineering Mechanics by S. S. Bhavikatti, New Age International Pvt. Ltd

3) Engineering Mechanics by D.P.Sharma, Pearson Education__

Reference Books

1) Engineering Mechanics by Manoj K Harbola, Cengage Learning
2) Vector Mechanics for Engineers Vol.I and II by F. P. Beer and E. R. Johnston, Tata Mc -Graw Hill
3) Engineering Mechanics by K. I. Kumar, Tata Mc -Graw Hill Publication
4) Engineering Mechanics by Irving H. Shames, Prentice Hall of India, New Delhi.

MOOC / NPTEL/YouTube Links

Sr. No.	Experiment Name	YouTube Video Link
1	Law of Polygon of Forces	https://youtu.be/hik9rkoBpqI
2	Jib Crane	https://youtu.be/o4PjLoCDRGk
3	Bell Crank Lever	https://youtu.be/U5MMgLfSHvA
4	Support Reactions of Beam	https://youtu.be/9w1c4pR1dQ4

Tatyasaheb Kore Institute of Engineering and Technology

First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEESC113** Course Name**: Basic Mechanical Engineering**

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 02Hours/Week	02	ISE: 40 Marks ESE: 60 Marks

Prerequisites, if any: 1) Mathematics

2) Basics ofThermodynamics

3)Basicsofenergysources

Course Objectives: The objective of the course is to

1) Acquire basic knowledge of mechanical engineering
2) Impart knowledge of basic conceptst of thermodynamics applied to industrial application
3) Understand principle of energy converse on system and power plants
4) Understand and identify power transmission devices with their functions

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Describe** the basic concepts of thermodynamics and solve SFEE problems.
CO2	**Demonstrate** working of IC Engine.
CO3	**Explain** working of VCRS and VARS
CO4	**Explain** the principles, construction and working of various power plants.
CO5	**Summarize** the working of energy converting and power transmission devices.
CO6	**Illustrate** the basic manufacturing processes.

Course Description: Basic Mechanical Engineering course is offered as the basic science course. This course describes the scope of mechanical engineering in multidisciplinary industries and important phenomenon to runtheworld.ThiscoursedescribestheapplicationsofMechanicalEngineeringinmanyrelative fields.

Course Content		
Unit-1	**Thermodynamics**	05Hrs
Introduction, Thermodynamic System, types, thermodynamics State, Process, Cycle, thermodynamic equilibrium, forms of energy, Heat, work, Internal Energy, First Law of Thermodynamics, Zeroth law, Application of First Law to steady Flow processes (Numerical Treatment), Limitations of First Law, PMM- I.		
Unit-2	**Introductionto ICEngine**	04Hrs
Introduction, Classification of IC engines, functions of major components of IC engine and terms used in IC engine, Construction and Working of four stroke S.I. and C.I. engines, Construction and Working Two strokes engines, Applications.		
Unit-3	**IntroductiontoRefrigeration&AirConditioning**	04Hrs
Introduction, Applications of Refrigeration & air conditioning, Refrigerant types and Properties, terms used in Refrigeration & air conditioning, working of Vapour compression Refrigeration system(VCRS), vapour absorption Refrigeration system (VARS) and Window Air Conditioning. (Descriptive Treatment only).		
Unit-4	**EnergySourcesandpowerplants**	04Hrs
Introduction to Renewable and non-renewable energy sources, construction, working, advantages, disadvantage and application of following power plants - Photo voltaic cell, Wind Power plant, Hydroelectric power plant, Steam Power plant, Bio-gas plant, Bio-Diesel (Descriptive Treatment only).		
Unit-5	**MechanicalPowerTransmissionandEnergyconversion devices**	04Hrs
Introduction, Type of Belt and types of belt drives (Descriptive Treatment only), slip of belt and creep of belt, chain drive –construction, working, applications and comparison with belt drive, Types of gears, its importance and applications, types of gear Trains and its applications, Construction, working and applications of centrifugal Pump.		
Unit-6	**ManufacturingProcesses**	05Hrs
Introduction to manufacturing processes and their classification, Casting Process-Steps involved in basic casting processes and applications of castings Metal removing processes- Lathe operations, milling & drilling machine operations Metal Joining Processes-Arc welding process, its working and applications, soldering and brazing processes and their applications.		

Learning Resources:

Text Books

1) Basic Mechanical Engineering by S. N. Sapali, Nirali Prakashan
2) Basic Mechanical Engineering by R. B. Patil, B. L. Singhal, Tech-Max publication
3) Basic Mechanical Engineering by P. G. Deshpande, Mahalaxmi Publications
4) Basic Mechanical Engineering by by S. D. Ambatkar, TechKnowledge Publications

Reference Books

1) Thermal Engineering by R.K. Rajput, Laxmi Publication, Delhi, ISBN-13-978-8131808047,9th edition.
2) Elements of Heat Engine Vol. I ,II ,III by Pateland Karam chandani , Acharya Book Depot.
3) Power Plant Engineering by Aroraand Domkunwar, Dhanpat RaiandSons
4) Elements of Workshop Technology, Vol. I and II by Hajara Choudhari

e-Books

1) https://mrcet.com/downloads/digital_notes/EEE/BME%20DIGITAL%20NOTES.pdf__
2) https://pmec.ac.in/wp-content/uploads/2025/04/Basic-Mechanical-Engineering-23ES1006.pdf
3) https://cdn1.byjus.com/wp-content/uploads/2022/08/TN-Board-Class-12-Basic-Mechanical-Engineering-Textbook.pdf

MOOC / NPTEL/YouTube Links

1) https://nptel.ac.in/courses/112/105/112105123/
2) https://nptel.ac.in/courses/112/103/112103262/
3) https://nptel.ac.in/courses/112/107/112107208/
4) https://nptel.ac.in/courses/121/106/121106014/
5) https://nptel.ac.in/courses/112/105/112105234/
6) https://nptel.ac.in/courses/112/107/112107219/

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEESC113T** Course Name: **Basic Mechanical Engineering Lab**

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 25 Marks

Prerequisites, if any: Theory knowledge of types and components of IC engine.
Theory knowledge of types and component so free frigerati on an dair conditioning system.
Theory knowledge of types of energy sources

Course Objectives: The objective of the course is to

1. Understand working of IC engine with the help of demo models.
2. Understand working of refrigeration and air condition in system with models.
3. Understandthefunctionsofpowertransmittingdeviceswiththedemomodels.
4. UnderstandtheworkingandoperationsofLatheMillingandDrillingmachines in machine shop.

Course Outcomes: After successful completion of the course, student will be able to

CO1	Describe the working of IC engine
CO2	Classify Renewable and non-renewable energy sources
CO3	Explain different mechanisms for power transmission systems
CO4	Understand various basic operations of Lathe, Milling and Drilling machines

Course Description: As this subject has huge scope in various industries, so in labs the concept, construction, working and demonstration of various machines, equipmentan devices is observed and understood with the help of various models.

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Hours
1	Solving SFEE numericals of first law of thermodynamics.	4Hrs
2	Demonstration of I.C. engine (SI. CI, 2 stroke and 4 stroke)	4 Hrs
3	Demonstration of vapour compression refrigeration system (VCRS), VARS and window air conditioner.	4Hrs
4	Demonstration of various power plants such as Windmill / Biogas / Hydroelectric Power Plant etc.	4Hrs
5	Demonstration of belt drive, chain drive, gear trains and centrifugal pump	4 Hrs
6	Demonstration of casting, metal removal and metal joining processes	4 Hrs

Learning Resources:

Text Books

1) Basic Mechanical Engineering by S. N. Sapali, Nirali Prakashan
2) Basic Mechanical Engineering by R. B. Patil, B. L. Singhal, Tech-Max publication
3) Basic Mechanical Engineering by P. G. Deshpande, Mahalaxmi Publications
4) Basic Mechanical Engineering by by S. D. Ambatkar, TechKnowledge Publications

Reference Books

1) ThermalEngineering byR.K. Rajput,LaxmiPublication, Delhi, ISBN-13-978-8131808047,9th edition.
2) ElementsofHeat EngineVol.I,II,III byPateland Karamchandani,AcharyaBookDepot.
3) PowerPlantEngineeringbyAroraandDomkunwar,DhanpaRaiandSons
4) Elements of WorkshopTechnology, Vol.IandIIbyHajaraChoudhari

e-Books

1. https://mrcet.com/downloads/digital_notes/EEE/BME%20DIGITAL%20NOTES.pdf__
2. https://pmec.ac.in/wp-content/uploads/2025/04/Basic-Mechanical-Engineering-23ES1006.pdf
3. https://cdn1.byjus.com/wp-content/uploads/2022/08/TN-Board-Class-12-Basic-Mechanical-Engineering-Textbook.pdf

MOOC / NPTEL/YouTube Links

1. https://nptel.ac.in/courses/112/105/112105123/
2. https://nptel.ac.in/courses/112/103/112103262/
3. https://nptel.ac.in/courses/112/107/112107208/
4. https://nptel.ac.in/courses/121/106/121106014/
5. https://nptel.ac.in/courses/112/105/112105234/
6. https://nptel.ac.in/courses/112/107/112107219/

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code:2501UFYEIKS114T Course Name: Indian Knowledge System (IKS)

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 01 Hour/Week	01	ISA 50 Marks

Prerequisites, if any:

Course Objectives: The objective of the course is to:

1. To make students conscious about the Traditional knowledge and its importance
2. To inculcate the importance of protecting traditional knowledge and kinds of traditional knowledge
3. To furnish information about the various sectors in traditional knowledge and protection of IKS
4. To kindle in them the Significance of historical places in the vicinity
5. To make them aware of the importance and benefits of Yoga and Meditation

Course Outcomes: After successful completion of the course, student will be able to

CO1	Understand the concept of Traditional knowledge and its importance.
CO2	Understand the traditional knowledge in different sectors.
CO3	Understand and perform yoga and meditation for the balanced life style
CO4	Understand the concepts of Intellectual property to protect the traditional knowledge.
CO5	Know the need and importance of protecting traditional knowledge.

Course Description:

Indian Knowledge Systems (IKS) is an innovative cell under Ministry of Education (MoE) at AICTE, New Delhi, to facilitate the students with the concepts of Indian traditional knowledge and to make them understand the Importance of roots of knowledge system. It is established to promote interdisciplinary research on all aspects of IKS, preserve and disseminate IKS for further research and societal applications. It will actively engage for spreading the rich heritage of our country and traditional knowledge in the field of Arts and literature, Agriculture, Basic Sciences, Engineering & Technology, Architecture, Management, Economics, etc.

Course Content

Unit-1	**Introduction to Traditional Knowledge**	(03 Hours)

- Define Traditional Knowledge (TK),
- Nature and characteristics
- Scope and importance, Types of traditional knowledge
- Traditional knowledge Vs western knowledge

Unit-2	**Traditional Knowledge in Different Sectors**	(03 Hours)

- Traditional knowledge in agricultural sector
- Need of meditation and its benefits in behavior pruning
- Need and Importance of Yoga in educational sector

Unit-3	**Traditional Knowledge and Intellectual Property**	(03 Hours)

- Systems of traditional knowledge protection,
- Legal concepts for the protection of traditional knowledge
- History and development of Warana industrial and educational complex

Unit-4	**Protection of Traditional Knowledge**	(03 Hours)

- The need for protecting traditional knowledge
- Significance of TK Protection
- Role of Government to harness TK
- Significance and protection of historical places in the vicinity of TKIET, Warana

Learning Resources:

Reference Books

1) *Traditional Knowledge System in India* by Amit Jha ,Atlantic publishers, 2002
2) *Knowledge Traditions and Practices of India* by Kapil Kapoor, Michel Danino
3) *Traditional Knowledge System and Technology in India* by Basanta Kumar Mohanta and Vipin Kumar Singh, Pratibha Prakashan ,2012.
4) *Traditional Knowledge System in India*, by Amit Jha, 2009

e-Books

1) **https://iksindia.org/ebook.php**
2) https://pcte.edu.in/wp-content/uploads/2025/03/E-Book-1.pdf
3) ***Introduction to Indian Knowledge System: Concepts and Applications*** by B. Mahadevan, Vinayak Rajat Bhat, and Nagendra Pavana R.N.
4) *Roots of Wisdom: Understanding Indian Knowledge System* by Dr. Alok Tripathi.
5) *Indian Knowledge Systems (IKS): A Legacy of Wisdom and Innovation* by Dr. Dheeraj Mehrotra.

MOOC / NPTEL/YouTube Links

1)https://iksindia.org/lectures-and-videos.php
2)https://www.youtube.com/watch?v=LZP1StpYEPM
3)http://nptel.ac.in/courses/121106003/
4)https://onlinecourses.swayam2.ac.in/ntr26_ed18/preview

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: 2501UFYECC115T **Course Name: Inquisitive Learning (IL)**

Teaching Scheme	Credit	Evaluation Scheme
Practical: 02 Hour/Week	01	ISA : 25 Marks Presentation:25Mark

Prerequisites, if any:

1) Basic problem-solving and logical reasoning skills acquired through prior academic learning.
2) Elementary communication skills for teamwork, documentation, and presentation.
3) Interest and readiness for hands-on, inquiry-based learning and project work.

Course Objectives: The objective of the course is to:

1) **Identify real-world problems** and frame meaningful inquiry-based project ideas through observation and questioning.
2) **Apply design thinking and problem-solving methodologies** to plan, design, and develop functional models or prototypes.
3) **Demonstrate hands-on experimentation and innovation skills** using appropriate tools, materials, and technologies.
4) **Work effectively in teams** by collaborating, managing tasks, and contributing responsibly to project execution.
5) **Communicate project outcomes clearly and professionally** through reports, presentations, and model/prototype demonstrations.

Course Outcomes: After successful completion of the course, student will be able to

CO1	Identify real life problems through rigorous literature survey from societal need point of view.
CO2	Analyze the identified problems through technological perspective.
CO3	Proposed suitable solution to contribute society using fundamental knowledge of engineering through modern tools.
CO4	Use of technology to demonstrate proposed work in oral & written form.
CO5	Develop ability to work as an individual and as a team member and inculcate attitude of this for lifelong learning.

Course Description:

Inquisitive Learning is a project-based, experiential course designed to cultivate curiosity, creativity, and problem-solving skills among students. The subject encourages learners to move beyond rote learning by actively identifying real-world problems and exploring innovative solutions through inquiry and experimentation. Students work individually or in teams to conceptualize, design, and develop a model or prototype, thereby gaining hands-on experience in applying theoretical knowledge to practical situations. The course emphasizes design thinking, teamwork, and effective communication, preparing students for multidisciplinary challenges and fostering a mindset of lifelong learning and innovation.

Group Structure:

Working in supervisor/mentor – monitored groups. The students Should plan, manage and complete a task/project/activity which addresses the stated problem.

a. There should be team/group of 5 -6 students
b. A supervisor/mentor teacher assigned to individual groups

Selection of Project/Problem:

The problem-based project oriented model for learning is recommended. The model begins with the identifying of a problem, often growing out of a question or "wondering". This formulated problem then stands as the starting point for learning. Students design and analyze the problem within an articulated interdisciplinary or subject frame. A problem can be theoretical, practical, social, technical, symbolic, cultural and/or scientific and grows out of students' wondering within different disciplines and professional environments. A chosen problem has to be exemplary. The problem may involve an interdisciplinary approach in both the analysis and solving phases .By exemplarity, a problem needs to refer back to a particular practical, scientific, social and/or technical Department of First Year B. Tech. domain. The problem should stand as one specific example or manifestation of more general learning outcomes related to knowledge and/or modes of inquiry. There are no commonly shared criteria for what constitutes an acceptable project. Projects vary greatly in the depth of the questions explored, the clarity of the learning goals, the content and structure of the activity.

a. A few hands-on activities that may or may not be multidisciplinary
b. Use of technology in meaningful ways to help them investigate, collaborate, analyze, synthesize and present their learning.
c. Activities may include-Solving real life problem, investigation /study and Writing reports of in depth study, field work.

Assessment:

The institution/head/mentor is committed to assessing and evaluating both student performance and program effectiveness. Progress of Inquisitive learning is monitored regularly on weekly basis.

Weekly review of the work is necessary. During process of monitoring and continuous assessment AND evaluation the individual and team performance is to be measured. Inquisitive learning is monitored and continuous assessment is done by supervisor/mentor and authorities. Students must maintain an institutional culture of authentic collaboration, self-motivation, peer-learning and personal responsibility. The institution/department should support students in this regard through guidance/orientation programs and the provision of appropriate resources and services. Supervisor/mentor and Students must actively participate in assessment and evaluation processes.

a. Group may demonstrate their knowledge and skills by developing a public product and/or report and/or presentation.

b. Individual assessment for each student (Understanding individual capacity, role and involvement in the project)
c. Group assessment (roles defined, distribution of work, intra-team communication and togetherness)
d. Documentation and presentation

Evaluation and Continuous Assessment:

It is recommended that the all activities are to be record and regularly, regular assessment of work to be done and proper documents are to be maintained at college end by both students as well as mentor (you may call it Inquisitive learning work book).Continuous Assessment Sheet (CAS) is to be maintained by all mentors/department and institutes. Recommended parameters for assessment, evaluation and weightage:

a. Idea Inception (10%)
b. Outcomes of Inquisitive learning / Problem Solving Skills/ Solution provided/ Final product (Individual assessment and team assessment) (20%)
c. Documentation (Gathering requirements, design & modeling, implementation/execution, use of technology and final report, other documents) (20%)
d. Demonstration (Presentation, User Interface, Usability etc) (50%)

Inquisitive learning workbook will serve the purpose and facilitate the job of students, mentor and project coordinator. This workbook will reflect accountability, punctuality, technical writing ability and work flow of the work undertaken.

Recommended Guidelines and Phases:

It is learning through activity. Following are the recommended guidelines that will work as an initiator and facilitator in process of completion of Inquisitive learning.

1. Get groups of students registered preferably 4-6 students per group.
2. Assign mentor to each group.
3. Provide guidelines for title identification (Problem can be some real life situation that needs technology solutions. This situation can be identified by meeting people around, visiting various industries, society, and institutes. The solution can be prototype, model, convertible solutions, survey and analysis, simulation, and similar).
4. Let students submit the problem identified in prescribed format (Title, Problem statement, details of a problem undertaken, and what is need of solution to the problem)
5. Mentor can approve the problem statements based on feasibility and learning outcomes expected for first year engineering students.
6. Mentor is to monitor progress of the task during phases of project work. Broadly phases may

include- requirements gathering, preparing a solution, technology design for the solution. (Optional phases- implementation and testing)

7. Fortnightly monitoring and continuous assessment record is to be maintained by mentor.

8. Get the report submitted at the end of semester.

Tutorials

No.	Practical/Experiment/TutorialTopic	Hrs.	Cognitivelevels of attainment asperBloom's
1	-	-	-
2	-	-	-
3	-	-	-
4	-	-	-
5	-	-	-
6	-	-	-
7	-	-	-
8	-	-	-
9	-	-	-
10	-	-	-

EvaluationandAssessmentSheet(Tobefilled inmymentor)			
Sr.No.	**Details**	**Maximum Marks**	**Marks Obtained**
1.	ProblemIdentification(IdeaInception)	**05**	
2.	ProblemAnalysis(RequirementGathering)	**05**	
3.	ProposedSolution(Model/Design/Process/prototype)	**05**	
4.	Report	**10**	
5.	Presentation	**25**	
TotalMarks		**50**	

Learning Resources:

Text Books

Reference Books
e-Books
MOOC / NPTEL/YouTube Links

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEBSC201** Course Name: **Engineering Mathematics-II**

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 03 Hours/Week	03	ISE: 40 Marks ESE: 60 Marks

Prerequisites, if any: 1. Trigonometric Identities
2. Differentiation and integration formulae
3. Shape of Basic curves like Circle, Parabola, Hyperbola etc.

Course Objectives: The objective of the course is to

1) Model a real life scenario into differential equations and solve them analytically and numerically
2) Learn different methods of solving improper and multiple integral

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Solve** ordinary differential equations of order one and degree one
CO2	**Apply** numerical methods to solve ordinary differential equations of first order and first degree
CO3	**Evaluate** double and triple integrals.
CO4	**Use** double integration to find area , mass of plane lamina.
CO5	**Evaluate** definite integrals using Gamma and Beta functions
CO6	**Estimate** definite integrals using numerical methods

Course Description:

Course Content

Unit-1	**Differential equation of first order first degree and Applications**	8

Exact Differential Equation,
Reducible to Exact Differential Equations,
Linear Differential Equation,
Reducible to Linear,
Application to orthogonal trajectory (Cartesian and Polar)

Unit-2	**Numerical Solution of Differential Equation of order one degree One**	7

Eulers Method
Eulers modified Method
Runge-Kutta Method of order four
Taylor Series Method

Unit-3	**Multiple Integrations**	8
Evaluation of double integral (Cartesian and polar) Change of order of integration (Cartesian and polar) Evaluation of triple integration Change of Cartesian to spherical coordinates		
Unit-4	**Application of Multiple Integrals**	6
Area using double integration Mass of plane lamina using double integration Moment of inertia of plane lamina Volume using triple integration		
Unit-5	**Integral Calculus**	7
Gamma Function and properties Beta function and properties Differentiation Under Integral Sign (with constant limits only)		
Unit-6	**Numerical Integration**	7
Trapezoidal Rule Simpson's(1/3)rule Simpson's(3/8) rule Weddle's rule		

Learning Resources:

Text Books

1) Higher Engineering Mathematics, Dr. B.S.Grewal ,S. Chandand Company,40th Edition.

Reference Books

1) AdvancedEngineeringMathematics",H.K.Das,S.ChandPublication,8thEdition
2) A Text Book of Applied Mathematics",Vol.I and II, P.N. Wartikar and J.N.Wartikar, Vidyarthi Griha Prakashan, Pune.
3) A textbook of Engineering Mathematics, .P.Bali,Iyengar,Laxmi Publications(P) Ltd, New Delhi
4) Advanced Engineering Mathematics ,Erwin Kreyszig, Wiley India Pvt .Ltd

MOOC / NPTEL/YouTube Links

1)https://nptel.ac.in/courses/111/106/111106100/
2)https://nptel.ac.in/courses/111/107/111107063/
3)https://nptel.ac.in/courses/111/105/111105122/
4)https://youtu.be/_cgzqVmvqtQ

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEBSC201T** Course Name: **Engineering Mathematics-II Tutorial**

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 01 Hours/Week	01	ISA: 25 Marks

Prerequisites, if any:
Trigonometric identities and Logarithmic identities
Differentiation and integration formulae
Shapes of basic curves like circle, parabola, ellipse, straight line.

Course Objectives: The objective of the course is to

1) Model a real life scenario into differential equations and solve them analytically and numerically
2) Learn different methods of solving improper and multiple integral.__

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Solve** linear and nonlinear ordinary differential equations of order one and find orthogonal trajectory.
CO2	**Find** numerical solutions of ordinary differential equations of first order and first degree
CO3	**Compute** double and triple integrals
CO4	**Find** area , mass of plane lamina using double integral.
CO5	**Evaluate** definite integrals using Gamma and Beta functions
CO6	**Solve** definite integral numerically.

Course Description:

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Assigned Hours
1	Exact and reducible exact differential equation	2
2	Linear, reducible to linear diff equation and Applications	2
3	Evaluation of double and triple integration	2
4	Change of order of integration	2
5	Area by double integral, Mass of Lamina	2
6	Gamma function and Differentiation under integral sign	2
7	Beta functions and properties	2
8	Euler and Eulers modified method	2

9	Taylor series and Runge Kutta of order four	2
10	Trapezoidal and Simpson (1/3) rule Simpsons (3/8)th andWeddles rule	2

Learning Resources:

1) Higher Engineering Mathematics, Dr. B. S. Grewal, S. Chand and Company, 40th Edition.

Reference Books

1) Advanced Engineering Mathematics", H. K. Das, S. Chand Publication, 8th Edition
2) A Text Book of Applied Mathematics",Vol. I and II, P. N.Wartikar and J. N. Wartikar, VidyarthiGriha Prakashan, Pune.
3) A textbook of Engineering Mathematics, N. P. Bali, Iyengar, Laxmi Publications (P) Ltd, New Delhi.
4)Advanced Engineering Mathematics,ErwinKreyszig, Wiley India Pvt. Ltd

MOOC / NPTEL/YouTube Links

1) **https://nptel.ac.in/courses/111/106/111106100/**
2) https://nptel.ac.in/courses/111/107/111107063/
3) https://nptel.ac.in/courses/111/105/111105122/
4) **https://youtu.be/_cgzqVmvqtQ**

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEHSSM202**Course Name: **Employability Enhancement Skills**

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 01 Hours/Week	01	ISE: 50 Marks

Prerequisites, if any:

1) Basic knowledge about English Vocabulary
2) Communication in simple English

Course Objectives: The objective of the course is

1) To make students conscious about Recruitment procedure and ethics at workplace
2) To inculcate the importance of Behavioural Skills in day to day communication
3) To enhance the writing skills with technical report writing practice
4) To prepare students to deliver speeches of various types / occasions

Course Outcomes: After successful completion of the course, student will be able to

CO1	**Understand** the procedure of recruitment drive
CO2	**Use** interpersonal skills with precision and competence in different scenario
CO3	**Prepare** technical reports for professional purposes
CO4	**Articulate** prepared speeches to express ideas, thoughts and emotions

Course Description:

Employment Enhancement Skills course has correlation with the Sem- I course Communication Skills. After learning the basics of language in the first semester, this course concentrates on the personality development, interpersonal skills and expectation from an industry. Hence the included models in the syllabus have the direct co-relation with employability of the students. This course would definitely boost personality and interpersonal skills of the learners.

Course Content

Unit-1	**Recruitment and Career Skills** • Importance of Planning and Managing Career (SWOC Analysis) • Job Application and Resume/CV/Bio data • Group Discussion • Corporate Etiquettes & Manners	03 Hrs
Unit-2	**Behavioural Skills** • Understanding Self: Self Esteem • Personality Types and Traits • Time Management & Stress Management • Positive Attitude Building • Emotional Intelligence	05 Hrs
Unit-3	**Technical Writing Skills** • Importance and Objectives of Technical Writing • Structure and Types of Reports (Investigation and	04 Hrs

	Accident Report) • Corporate Email Writing: Dos & Don'ts	
Unit-4	**Developing Presentation Skills** • Techniques of Public Speaking • Speeches for Various Occasions: • Welcome Speech, Introduction of a Guest, Vote of Thanks • Mock Personal Interview	02 Hrs

Learning Resources:

Reference Books

1. *Communication Skills for Engineers by S. Mishra & C. Muralikrishna (Pearson)*
2. *Communication Skills by Meenakshi Raman and Sangeeta Sharma, Oxford University, Press 2016 1st Edition*
3. *Lesikar, R. V. and Pettit, J. ,D. Basic Business Communication, McGraw-Hill International Edition, Singapore 10th Edition, 2006*
4. *Managing Soft Skills for Personality Development* by B.N. Ghosh, Tata McGraw Hill, 2012
5. *Bikram K. Das, Kalyani Samantray, "An Introduction to Professional English and Soft Skills" Cambridge University Press New Delhi*
6. *Comfort, Jeremy, et al. (2011) Speaking Effectively: Developing Speaking Skills for Business English. Cambridge: Cambridge University Press. (Reprint)*
7. *Sharma, R. C. and Krishna Mohan, Basic Correspondence and Report Writing: A Practical Approach to Business and Technical Communication, Tata McGraw-Hill Publishing Company Limited, India ,5th Edition, 2017*
8. *Business Correspondence & Report-writing by R.C. Sharma & Krishna Mohan,Tata McGraw-Hill Education*
9. *Dr. Abha Singh, "Behavioural Science" Wiley India Pvt. Ltd*
10. *Soft Skills by K. Alex, S. Chand and Company, 2013*

e-Books

1. https://cbseacademic.nic.in/web_material/Curriculum21/publication/secondary/Employability_Skills10.pdf
2. https://bharatskills.gov.in/pdf/E_Books/CTS/ES/English/ES_StudentWB_2ndYearW-NEW.pdf

MOOC / NPTEL/YouTube Links

1.https://onlinecourses.swayam2.ac.in/ntr26_ed53/preview
2.https://onlinecourses.nptel.ac.in/noc26_hs73/preview
3.https://onlinecourses.nptel.ac.in/noc26_hs01/preview
4.https://onlinecourses.nptel.ac.in/noc26_hs55/preview
5www.buisnesscommunicationskills.com,
4.www.kcitraing.com www.mindtools.com
5.https://uk.indeed.com/career-advice/career-development/behavioral-skills
www.slite.com/learn/technical-writing
6.www.in.indeed.com/career-advice/finding-a-job/what-does-technical-writer-do
https://www.oxfordsummercourses.com/articles/how-to-improve-your-presentation-skills

Tatyasaheb Kore Institute of Engineering and Technology
First Year of Bachelor of Technology (F.Y. B.Tech)

Course Code: **2501UFYEHSSM202T** Course Name: **Employment Enhancement Skills Lab**

Teaching Scheme	Credit	Evaluation Scheme
Practical: 02 Hours/Week	01	ISA: 25 Marks

Prerequisites, if any:

1. Basic knowledge about English Vocabulary
2. Communication in simple English

Course Objectives: The objective of the course is to

1. Strengthening Recruitment Skills- Group Discussion & Personal Interview
2. inculcate the Behavioural Skills in day to day communication and corporate environment
3. Preparing students for writing technical reports and delivering speeches on different occasions

Course Outcomes: After successful completion of the course, student will be able to

CO1	Understand the procedure of recruitment drive
CO2	Prepare technical reports for variety of purposes
CO3	Deliver prepared speeches to express ideas, thoughts and emotions
CO4	Use interpersonal skills with precision and competence in different scenario

Course Description:

This course is designed to differentiate between formal and informal communication and language, strategies for communicating in the workplace, using negotiation and diplomacy, and how to be a good promoter of using communication and soft skills complementing to hard skills while getting to be recruited and applying workplace etiquettes.

Course Content

Sr. No.	Topic of Practical/Experiment/Tutorial	Hours
1	SWOC- Analysis	02 Hours
2	Group Discussion	02 Hours
3	Debate	02 Hours
4	Extempore or Pep talk	02 Hours
5	Speeches for Various Occasions	02 Hours
6	Email Writing	02 Hours
7	Practice on Technical Writing	02 Hours
8	Mock Interview	02 Hours

Learning Resources:

Reference Books

1) Communication Skills for Engineers by S. Mishra & C. Murali Krishna (Pearson)

2) Communication Skills by Meenakshi Raman and Sangeeta Sharma, Oxford University

3) Press 2016 1st Edition

4) Lesikar, R. V. and Pettit, J. ,D. Basic Business Communication, McGraw-Hill International Edition, Singapore 10th Edition, 2006

5) *Managing Soft Skills for Personality Development* by B.N. Ghosh, Tata McGraw Hill,

6) 2012.

7) Bikram K. Das, Kalyani Samantray, "An Introduction to Professional English and Soft

8) Skills" Cambridge University Press New Delhi.

9) Comfort, Jeremy, et al. (2011) Speaking Effectively: Developing Speaking Skills for Business English. Cambridge: Cambridge University Press. (Reprint)

10) Sharma, R. C. and Krishna Mohan, Basic Correspondence and Report Writing: A Practical Approach to Business and Technical Communication, Tata McGraw-Hill Publishing Company Limited, India ,5th Edition, 2017

11) Business Correspondence & Report-writing by R. C. Sharma & Krishna Mohan, Tata McGraw-Hill Education

12) Dr. Abha Singh, "Behavioural Science" Wiley India Pvt.Ltd

13) Soft Skills by K. Alex, S. Chand and Company, 2013

e-Books

1. https://cbseacademic.nic.in/web_material/Curriculum21/publication/secondary/Employability_Skills10.pdf
2. https://bharatskills.gov.in/pdf/E_Books/CTS/ES/English/ES_StudentWB_2ndYearW-NEW.pdf

MOOC / NPTEL/YouTube Links

1. https://onlinecourses.swayam2.ac.in/ntr26_ed53/preview
2. https://onlinecourses.nptel.ac.in/noc26_hs73/preview
3. https://onlinecourses.nptel.ac.in/noc26_hs01/preview
4. https://onlinecourses.nptel.ac.in/noc26_hs55/preview
5. www.buisnesscommunicationskills.com,
6. www.kcitraing.com www.mindtools.com
7. https://uk.indeed.com/career-advice/career-development/behavioral-skills www.slite.com/learn/technical-writing
8. www.in.indeed.com/career-advice/finding-a-job/what-does-technical-writer-do https://www.oxfordsummercourses.com/articles/how-to-improve-your-presentation-skills
9. www.buisnesscommunicationskills.com, www.kcitraing.com, www.mindtools.com