

Shree Warana Vibhag Shikshan Mandal's

**WARANA UNIVERSITY,
WARANANAGAR**

(A State Public University established under Section 3 (6) of MPUA, 2016)

॥ विद्या सर्वस्य भूषणम् ॥



Warana University

Established:2025

**Structure & Syllabus For
First Year Bachelor of Technology (F.Y. B. Tech)
Semester- I and II
(Common to All UG Programs)**

UNDER

Faculty of Science & Technology

(As Per National Education Policy – 2020)

With Effect from Academic Year 2025-26 Onwards



Shree Warana Vibhag Shikshan Mandal's
TATYASAHEB KORE INSTITUTE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS), WARANANAGAR, KOLHAPUR



Lead Institute of



WARANA UNIVERSITY, WARANANAGAR
(A State Public University)



First Year Bachelor of Technology (F.Y. B. Tech) Semester-I & II

Common to All UG Programs

Under

Faculty of Science & Technology

From Academic Year 2025-26

Structure and Syllabus as per NEP Policy 2020

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Preface

The National Education Policy (NEP) 2020 has marked a significant transformation in India's education system, aiming to align higher education with the evolving needs of the 21st century. Warana University is firmly committed to the effective implementation of NEP 2020 in its true spirit, with a strong emphasis on holistic, multidisciplinary, and outcome-based education in accordance with the guidelines of the Government of Maharashtra.

We are pleased to present the First Year B. Tech Syllabus, meticulously crafted to align with the core philosophy of NEP 2020, effective from the Academic Year 2025-26. This curriculum is designed to provide students with a robust foundation in Mathematics and Sciences, while simultaneously integrating Vocational and Skill Enhancement courses, the Indian Knowledge System (IKS), and Co-curricular activities. Our goal is to nurture well-rounded engineers who possess both technical excellence and the adaptability required for global demands.

Special emphasis has been given to experiential learning, where theoretical concepts are reinforced through practical laboratory work, project-based learning, and industry-oriented activities. The syllabus also promotes research, innovation, and entrepreneurship, encouraging students to engage in creative and investigative pursuits from the early stages of their academic journey.

We extend our sincere gratitude to the Chairpersons and members of the various Boards of Studies for their dedicated efforts in designing this forward-looking curriculum.

At Warana University, we believe this syllabus will empower our students with the critical thinking, creativity, and technical proficiency necessary to excel in their professional lives. Warana University looks forward to supporting students in this transformative and enriching academic journey.

Program Outcomes

1. **Engineering Knowledge** Graduates will possess a strong foundation in engineering fundamentals and apply this knowledge to identify, analyze, and solve complex engineering problems. They will be able to understand and apply principles of mathematics, science, and engineering to a variety of real-world situations.
2. **Problem Analysis and Solution Design** Graduates will be able to critically analyze engineering problems and design effective solutions. Using their skills in problem-solving and analytical thinking, they will develop innovative solutions while considering factors such as feasibility, sustainability, and societal impact.
3. **Design and Development of Solutions** Graduates will be able to design and develop solutions for complex engineering problems by selecting and applying appropriate engineering design principles, tools, and techniques. They will also consider ethical, cultural, and environmental aspects in their designs, contributing to sustainable solutions.
4. **Investigation and Research** Students will be equipped with the skills to conduct in-depth investigations and research into engineering problems, using appropriate research methodologies, experiments, and data analysis. This ability will help them to evaluate solutions, optimize designs, and innovate within their field.
5. **Modern Tool Usage** Graduates will be proficient in using modern engineering tools, technologies, and software relevant to their specialization. They will understand the limitations and appropriate application of these tools in solving engineering problems and designing systems, products, and processes.
6. **The Engineer and Society** Graduates will be aware of the impact of engineering solutions on society, the environment, and public safety. They will be equipped to practice engineering in a socially responsible manner, adhering to professional ethics, and contributing positively to the welfare of society.
7. **Environment and Sustainability** Graduates will understand the importance of sustainability and the need to consider environmental impact when designing solutions. They will be capable of creating engineering solutions that promote environmental sustainability, using renewable resources, and minimizing waste and pollution.
8. **Ethics and Professionalism** Graduates will demonstrate professional ethics in their engineering practices, showing integrity, accountability, and social responsibility. They will follow industry standards, uphold ethical decision-making, and work in a manner that reflects the values of the engineering profession.
9. **Teamwork and Communication** Graduates will have strong interpersonal skills, working effectively in multidisciplinary teams. They will communicate ideas and solutions clearly, both in written and oral forms, and be able to collaborate with peers, colleagues, and stakeholders in a professional manner.
10. **Life-Long Learning** Graduates will have a mindset of continuous improvement and lifelong learning. They will be capable of adapting to new technological advancements, seeking out opportunities for professional development, and staying current with industry trends throughout their careers.
11. **Leadership and Innovation** Graduates will demonstrate leadership qualities, take initiative in projects, and contribute to innovative solutions within their field. They will foster creativity, encourage new ideas, and embrace challenges with an entrepreneurial mindset.

Duration

- The Bachelor of Technology (B.Tech.) Programme is a full-time undergraduate programme of four years' duration.
- The programme is structured into eight semesters, with each academic year comprising two semesters. Each semester includes theory courses, laboratory work, skill-based training, project components, and industry-oriented activities as prescribed in the curriculum.
- First Year B.Tech. consists of the first and second semesters, which provide foundational knowledge in basic sciences, engineering principles, and professional skills required for subsequent years of study.

Eligibility

1. Educational Qualification:

The candidate shall have passed the Higher Secondary Certificate (HSC) examination or its equivalent examination with:

- Physics and Mathematics as compulsory subjects, and
- Any one of the following subjects: Chemistry / Biotechnology / Biology / Technical or Vocational Subject / Computer Science / Information Technology / Informatics Practices / Agriculture / Engineering Graphics / Business Studies.

The candidate shall have obtained:

- At least 45% marks (minimum 134 marks) in the above subjects taken together for Open Category candidates.
- At least 40% marks (minimum 119 marks) for candidates belonging to Reserved Categories, EWS, and Persons with Disability (PwD).

2. Entrance Examination Requirement:

The candidate shall have obtained a non-zero score in MHT-CET OR JEE (Main).

3. Alternative Qualification (Diploma Route):

The candidate shall have passed a Diploma in Engineering and Technology and obtained:

- At least 45% marks for Open Category candidates.
- At least 40% marks for Reserved Categories, EWS, and Persons with Disability (PwD).

Medium of Instruction

The medium of instruction for the First Year B.Tech. program shall be English.

Abbreviations

Acronym	Full Form
ISE	In-Semester Examination
ISE-I	In-Semester Examination-I
ISE-II	In-Semester Examination-II
ESE	End Semester Examination
ISA	In-Semester Assessment (Term Work)
L	Lecture
T	Tutorial
P	Practical
CH	Contact Hours
C	Credit
BSC	Basic Science Course
ESC	Engineering Science Course
PCC	Program Core Courses
HSSM	Humanities Social Science and Management
VSEC	Vocational and Skill Enhancement Course
CC	Co-curricular course
AEC	Ability Enhancement Course
IKS	Indian Knowledge System
MAC	Mandatory Audit Course

Examination & Evaluation Pattern

Evaluation tools used for the evaluation of a student for each course is as follows:

For Theory Courses	In-Semester Examination (ISE) And End Semester Examination (ESE)
For Lab / Tutorial Courses	In-Semester Assessment (ISA) And / Or Practical and Oral Examination (POE)

Refer course structure for specific evaluation tools used for each course.

In-Semester Examination (ISE)

The In-Semester Examination (ISE) will be conducted at the departmental level. There will be two tests in each semester for every theory course: ISE-I and ISE-II.

- Each test will be of 40 marks.
- The duration of each test will be 1 hour and 30 minutes.

The total ISE marks will be calculated as the average of ISE-I and ISE-II. These rules may be modified from time to time as per the guidelines of the concerned regulatory authorities.

- ISE-I will cover Unit I and Unit II.
- ISE-II will cover Unit III and Unit IV.

■ Minimum Passing Criteria

Students must score a minimum of 40% marks in the ISE. If a student fails to secure the minimum required marks, he/she must appear for a Make-up Examination.

The Make-up Examination will be conducted in the same semester for:

- Students who fail to secure minimum passing marks.
- Students who were absent due to valid reasons such as medical issues, natural calamities, or participation in NSS, NCC, or similar activities (subject to verification of absence and recommendation from the Head of Department).

▪ **Special Provision**

If a failed student appears for three tests (including the Make-up test) and scores more than 16 marks when calculating the average of the best two out of the three tests, the student will be awarded the minimum passing marks of 16 only.

For students absent with valid reasons:

- If absent in one test, the average of the attempted test and the Make-up test will be considered.
- If absent in two tests, the decision will be taken after reviewing the reasons and based on the recommendation of the Head of Department.

End Semester Examination (ESE):

The End Semester Examination (ESE) will be conducted for 60 marks and will be based on the entire syllabus. The duration of each examination will be 2 hours.

Weightage of Units

The weightage of units in the ESE question paper will be as follows:

- a) Units that are not covered in ISE-I or ISE-II will carry 30% weightage each.
- b) Units that are covered in ISE-I and ISE-II will carry 10% weightage each.

Backlog Examination

Students who fail in the End Semester Examination (ESE) of either the odd or even semester within an academic year will be allowed to appear for the Backlog Examination, which will be conducted along with the regular ESE of the respective semester.

▪ **Re-Examination of ESE**

A Re-Examination (Make-up Examination) for all courses (UG and PG), including both theory and laboratory courses, will be conducted once a year before the commencement of the odd semester of the next academic year.

- A one-grade penalty will be applied to students appearing for the Make-up/Re-Examination.
- However, no grade penalty will be applied if a student secures a 'P' grade in the Make-up/Re-Examination.
- Grace marks will not be awarded for the Make-up/Re-Examination.
- Exception: Grace marks may be considered if the student is appearing for the ESE for the first time.

- **Eligibility Criteria for ESE**

To be eligible for the End Semester Examination (ESE), a student must:

- Secure at least 40% marks in ISE and ISA of the concerned course.
- Fulfil the attendance requirements as per the norms of Warana University, Warananagar.

If a student does not meet these requirements, he/she will not be eligible to appear for the ESE.

Nature of Question Paper: General (For all subject except Engineering Mechanics & Computer Aided Engineering Drawing)

Q. No.		Marks	BL	CO
1	Attempt any Four	8		
a	Unit -1			
b	Unit -2			
c	Unit -3			
d	Unit -4			
e	Unit -1/2/3/4			
f	Unit -1/2/3/4			
2	Attempt All	16		
a	Unit -1			
b	Unit -2			
c	Unit -3			
d	Unit -4			
3	Attempt any Three	18		
a	Unit -5			
b	Unit -5			
c	Unit -5			
d	Unit -5			
4	Attempt any Three	18		
a	Unit -6			
b	Unit -6			
c	Unit -6			
d	Unit -6			

Nature of Question Paper: Engineering Mechanics

Q. No.		Marks	BL	CO
1	Attempt any Two (Unit 1 to 4)	6		
a		3		
b		3		
c		3		
2	Attempt all (Unit 1 to 4)	18		
a		9		
b		9		
3	Attempt the following	18		
a	Unit -5	10		
b	Unit -5	8		
	OR			
b	Unit -5	8		
4	Attempt any Three	18		
a	Unit -6	10		
b	Unit -6	8		
	OR			
b	Unit -6	8		

Nature of Question Paper: Engineering Mechanics

Q. No.		Marks	BL	CO
1	Attempt All (Unit 1 to 4)	24		
a		8		
b		8		
c		8		
2	Attempt the following	18		
a	Unit -5	10		
b	Unit -5	8		
	OR			
b	Unit -5	8		
3	Attempt the following	18		
a	Unit -6	10		
b	Unit -6	8		
	OR			
b	Unit -6	8		

In Semester Assessment (ISA):

ISA for laboratory courses will be conducted as a continuous assessment throughout the semester. The assessment will be based on the following:

1. Performance in laboratory work.
2. Submission of experiments in the form of a properly maintained journal or report.
3. Timely completion of assigned experiments.
4. Attendance in laboratory sessions.
5. Understanding of the experiments conducted, evaluated through methods such as quizzes, oral examinations, case studies, field work, surveys, open-book tests, model preparation, programming, projects, or any other criteria specified by the course teacher.

Practical Oral Examination (POE):

POE for laboratory courses will be conducted immediately after the end of the semester. The duration of the practical examination will be as specified in the curriculum structure. The POE will be conducted jointly by an Internal Examiner and an External Examiner.

The examination may be conducted in any one of the following ways:

1. Oral Examination Only

Both the Internal and External Examiners will ask questions based on the practical content of the course to assess the student's practical knowledge.

2. Practical Examination Only

Students will be required to perform a given experiment, complete a workshop task, prepare a drawing, or develop a computer program, as applicable. In this case, the student's performance will be evaluated by the External Examiner only.

3. Practical and Oral Examination

Students will first perform a given practical task. This will be followed by an oral examination (viva voce) based on the practical content of the course. The student's performance will be evaluated jointly by both the Internal and External Examiners.

Grading System

The University follows a **10-Point Grading System** to evaluate student performance.

- **Conversion of Marks into Grades**

In every semester, the marks you get in each subject (out of 100) are converted into **grade points** as per the table below. You need at least **40% marks** to pass a subject.

Marks Obtained (Out of 100)	Grade Point	Letter Grade	Meaning
Absent	0	AB	Absent
0 – 39	0	F	Fail
40 – 44	4	P	Pass
45 – 49	5	C	Average
50 – 59	6	B	Above Average
60 – 69	7	B+	Good
70 – 79	8	A	Very Good
80 – 89	9	A+	Excellent
90 – 100	10	O	Outstanding

Note:

1. If decimal marks are 0.5 or more, they will be rounded off to the next higher number. (Example: 59.5 will become 60)
2. For courses of 50 marks or 200 marks, marks will be converted proportionally to 100 marks before assigning grade points.

- **Calculation of Semester Grade Point Average (SGPA)**

SGPA is calculated at the end of each semester. It shows your average performance in one semester.

$$SGPA = \frac{\sum(\text{Credit} \times \text{Grade Point}) \text{ for each course of a Semester}}{\sum(\text{Credits}) \text{ for a Semester}}$$

- **Calculation of Cumulative Grade Point Average (CGPA)**

CGPA is calculated after completing multiple semesters. CGPA reflects the overall academic performance of the student in the program.

$$CGPA = \frac{\sum \left(\frac{\text{Total Credits of a Semester} \times \text{SGPA of Respective Semester}}{\text{Total Credits of a Semester}} \right) \text{ of all semesters}}{\sum(\text{Course Credits}) \text{ of all Semesters}}$$

Note: The SGPA & CGPA shall be rounded off to 2 decimal points.



First Year B. Tech

Curriculum Structure and Evaluation Scheme of Semester-I for Group A

Course Category	Course Code	Course Title	Teaching and Credit Scheme					Examination and Evaluation Scheme			
			L	T	P	CH	C	Comp onent	Marks	Min for Passing	
BSC	2501UFYEBSC101	Engineering Physics	3	-	-	3	3	ISE	40	16	40
								ESE	60	24	
	2501UFYEBSC101T	Engineering Physics Lab	-	-	1	2	1	ISA	25	10	
	2501UFYEBSC102	Engineering Mathematics-I	3	-	-	3	3	ISE	40	16	40
								ESE	60	24	
2501UFYEBSC102T	Engineering Mathematics-I Tutorial	-	1	-	1	1	ISA	25	10		
ESC	2501UFYEESC103	Basic Electrical and Electronics Engineering	2	-	-	2	2	ISE	40	16	40
								ESE	60	24	
	2501UFYEESC103T	Basic Electrical & Electronics Engineering Lab	-	-	1	2	1	ISA	25	10	
	2501UFYEESC104	Basic Civil Engineering	2	-	-	2	2	ISE	40	16	40
								ESE	60	24	
	2501UFYEESC104T	Basic Civil Engineering Lab	-	-	1	2	1	ISA	25	10	
	2501UFYEESC105	Computer Aided Engineering Drawing	2	-	-	2	2	ISE	40	16	40
ESE								60	24		
2501UFYEESC105T	Computer Aided Engineering Drawing Lab	-	-	1	2	1	ISA	25	10		
HSSM	2501UFYEHSSM106	Communication Skills	1	-	-	1	1	ISE	50	20	
	2501UFYEHSSM106T	Communication Skills lab	-	-	1	2	1	ISA	25	10	
CC	2501UFYECC107T	Cyber Security Lab	-	-	1	2	1	ISA	50	20	
VSEC	2501UFYEVSEC108T	Manufacturing Techniques Lab	-	-	1	2	1	ISA	50	20	
MAC	2501UFYEMAC109A	Democracy, Elections and Good Governance*	-	-	-	-	-	-	-	-	
Total			13	1	7	28	21		800		



First Year B. Tech

Curriculum Structure and Evaluation Scheme of Semester-II for Group A

Course Category	Course Code	Course Title	Teaching and Credit Scheme					Examination and Evaluation Scheme			
			L	T	P	CH	C	Comp onent	Mark	Min for Passing	
BSC	2501UFYEBSC110	Engineering Chemistry	3	-	-	3	3	ISE	40	16	40
								ESE	60	24	
	2501UFYEBSC110T	Engineering Chemistry Lab	-	-	1	2	1	ISA	25	10	
	2501UFYEBSC201	Engineering Mathematics-II	3	-	-	3	3	ISE	40	16	40
								ESE	60	24	
2501UFYEBSC201T	Engineering Mathematics- II Tutorial	-	1	-	1	1	ISA	25	10		
PCC	2501UFYEPCC111	Computer Programming in C	2	-	-	2	2	ISE	40	16	40
								ESE	60	24	
	2501UFYEPCC111T	Computer Programming in C Lab	-	-	1	2	1	ISA	25	10	
ESC	2501UFYEESC112	Engineering Mechanics	2	-	-	2	2	ISE	40	16	40
								ESE	60	24	
	2501UFYEESC112T	Engineering Mechanics Lab	-	-	1	2	1	ISA	25	10	
	2501UFYEESC113	Basic Mechanical Engineering	2	-	-	2	2	ISE	40	16	40
								ESE	60	24	
2501UFYEESC113T	Basic Mechanical Engineering Lab	-	-	1	2	1	ISA	25	10		
IKS	2501UFYEIKS114T	Indian Knowledge System	1	-	-	1	1	ISA	50	20	
HSSM	2501UFYEHSSM202	Employability Enhancement Skills	1	-	-	1	1	ISE	50	20	
	2501UFYEHSSM202T	Employability Enhancement Skills Lab	-	-	1	2	1	ISA	25	10	
CC	2501UFYECC115T	Inquisitive Learning	-	-	1	2	1	ISA	25	20	
								POE	25		
Total			14	1	6	27	21		800		



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Curriculum Structure and Evaluation Scheme of Semester-I for Group B

Course Category	Course Code	Course Title	Teaching and Credit Scheme					Examination and Evaluation Scheme			
			L	T	P	CH	C	Comp onent	Marks	Min for Passing	
BSC	2501UFYEBSC110	Engineering Chemistry	3	-	-	3	3	ISE	40	16	40
								ESE	60	24	
	2501UFYEBSC110T	Engineering Chemistry Lab	-	-	1	2	1	ISA	25	10	
	2501UFYEBSC102	Engineering Mathematics-I	3	-	-	3	3	ISE	40	16	40
								ESE	60	24	
2501UFYEBSC102T	Engineering Mathematics- I Tutorial	-	1	-	1	1	ISA	25	10		
PCC	2501UFYEPCC111	Computer Programming in C	2	-	-	2	2	ISE	40	16	40
								ESE	60	24	
	2501UFYEPCC111T	Computer Programming in C Lab	-	-	1	2	1	ISA	25	10	
ESC	2501UFYEEESC112	Engineering Mechanics	2	-	-	2	2	ISE	40	16	40
								ESE	60	24	
	2501UFYEEESC112T	Engineering Mechanics Lab	-	-	1	2	1	ISA	25	10	
	2501UFYEEESC113	Basic Mechanical Engineering	2	-	-	2	2	ISE	40	16	40
								ESE	60	24	
2501UFYEEESC113T	Basic Mechanical Engineering Lab	-	-	1	2	1	ISA	25	10		
HSSM	2501UFYEHSSM106	Communication Skills	1	-	-	1	1	ISE	50	20	
	2501UFYEHSSM106T	Communication Skills Lab	-	-	1	2	1	ISA	25	10	
IKS	2501UFYEIKS114T	Indian Knowledge System	1	-	-	1	1	ISA	50	20	
CC	2501UFYECC115T	Inquisitive Learning	-	-	1	2	1	ISA	25	20	
POE								25			
MAC	2501UFYEMAC109A	Democracy, Elections and Good Governance*	-	-	-	-	-	-	-	-	
Total			14	1	6	27	21	--	800	--	



First Year B. Tech

Curriculum Structure and Evaluation Scheme of Semester-II for Group B

Course Category	Course Code	Course Title	Teaching and Credit Scheme					Examination and Evaluation Scheme			
			L	T	P	CH	C	Component	Marks	Min for Passing	
BSC	2501UFYEBSC101	Engineering Physics	3	-	-	3	3	ISE	40	16	40
								ESE	60	24	
	2501UFYEBSC101T	Engineering Physics Lab	-	-	1	2	1	ISA	25	10	
	2501UFYEBSC201	Engineering Mathematics-II	3	-	-	3	3	ISE	40	16	40
								ESE	60	24	
2501UFYEBSC201T	Engineering Mathematics-II Tutorial	-	1	-	1	1	ISA	25	10		
ESC	2501UFYEESC103	Basic Electrical and Electronics Engineering	2	-	-	2	2	ISE	40	16	40
								ESE	60	24	
	2501UFYEESC103T	Basic Electrical & Electronics Engineering Lab	-	-	1	2	1	ISA	25	10	
	2501UFYEESC104	Basic Civil Engineering	2	-	-	2	2	ISE	40	16	40
								ESE	60	24	
	2501UFYEESC104T	Basic Civil Engineering Lab	-	-	1	2	1	ISA	25	10	
	2501UFYEESC105	Computer Aided Engineering Drawing	2	-	-	2	2	ISE	40	16	40
ESE								60	24		
2501UFYEESC105T	Computer Aided Engineering Drawing Lab	-	-	1	2	1	ISA	25	10		
HSSM	2501UFYEHSSM202	Employability Enhancement Skills	1	-	-	1	1	ISE	50	20	
	2501UFYEHSSM202T	Employability Enhancement Skills Lab	-	-	1	2	1	ISA	25	10	
CC	2501UFYECC107T	Cyber Security Lab	-	-	1	2	1	ISA	50	20	
VSEC	2501UFYEVSEC108T	Manufacturing Techniques Lab	-	-	1	2	1	ISA	50	20	
Total						28	21		800		

Tatyasaheb Kore Institute of Engineering and Technology First Year 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 Hrs
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 Hrs
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 Hrs
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 Hrs
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 Hrs
Introduction, Theories of light, Interference of light and types, Diffraction of light and types, Construction of diffraction grating, Theory of Fraunhofer 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 Hrs
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 Kittel, 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

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.

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 $\sin n\theta$ 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

Unit-1	Matrices and Solution of Linear System Equations	7 Hrs
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 Hrs
Eigen Values, Properties of Eigen Values, Eigenvectors, Properties of Eigen vectors, Cayley-Hamilton's theorem (Without proof)		
Unit-3	Complex Numbers	7 Hrs
De Moivre's Theorem (Without proof), Roots of complex numbers by using De Moivre's Theorem, Expansion of $\sin \theta$ and $\cos \theta$ in powers of $\sin \theta$ and /or $\cos \theta$, Circular functions of a complex variable, Hyperbolic and Inverse Hyperbolic Functions- definitions.		
Unit-4	Finite Differences	6 Hrs
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 Hrs
Gauss elimination method, Gauss-Jordan method, Jacobi's iteration method, Gauss-Seidel iteration method.		
Unit-6	Partial Differentiation and its Application	8 Hrs
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:2501UFYEBSC102TCourse Name: Engineering Mathematics-I Tutorial		
Teaching Scheme	Credit	Evaluation Scheme
Tutorial: 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 Jordan 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: 2501UFYEEESC103 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	5 Hrs
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)		
Unit-2	Title of Unit	4 Hrs
Concept of MMF, reluctance, magnetic flux, Magnetic flux density, magnetic field strength, Comparison of Electric & magnetic circuit, Analysis of Series magnetic circuits.		
Unit-3	Title of Unit	5 Hrs
Introduction of Diode and V-I characteristics, Rectifier configuration, Analysis of Half Wave		

Rectifier, Full wave Rectifier and Bridge Rectifier, Introduction of Transistor.		
Unit-4	Title of Unit	5 Hrs
Faradays laws, Lenz's Law, generation of sinusoidal voltage, Analysis of pure Resistive, Inductive, Capacitive circuits, Analysis of series R-L, R-C, R-L-C circuits. (Numerical treatment on series R-L, R-C, R-L-C circuits)		
Unit-5	Title of Unit	4 Hrs
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.		
Unit-6	Title of Unit	5 Hrs
Construction, operating principle, types, EMF Equation, Turns Ratios, Ideal transformer, Power losses. (Numerical treatment on EMF Equation)		
Learning Resources:		
Text Books		
1) P.V. Prasad and S. Shivan Raju– Electrical Engineering Concepts and applications–cengage 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
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

- 1) P.V.Prasad and S.Shivan Raju – Electrical engineering concepts and applications – cenagage 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
- 2) Nagarath I.J. and D.P.Kothari – Basic Electrical Engineering (2001) – Tata McGraw Hill.
- 3) 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		
1) Learn the brief introduction of all aspects under civil engineering.		
2) 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	05 Hrs
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	05 Hrs
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	03 Hrs
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	05 Hrs

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	04 Hrs
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	04 Hrs
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, 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		
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: 2501UFYEESC104TCourse Name: Basic Civil Engineering Lab		
Teaching Scheme	Credit	Evaluation Scheme
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=IKa6b55t5M9k58ld>

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 – Tickle’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
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, Solid using AutoCAD	
CO3	Create orthographic projection using AutoCAD	
CO4	Visualize and develop surfaces of solids using AutoCAD.	
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 using AutoCAD	10
2	Draw the projections of planes using AutoCAD	8
3	Draw the projections of solids using AutoCAD	8
4	Imagine and draw the orthographic views using AutoCAD	8
5	Draw development of the surfaces of the solids using AutoCAD.	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. 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, WILEY 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 – Tickle’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 Communication - 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:		
Text Books		
1) Communication Skills Meenakshi Raman and Sangeeta Sharma Oxford University Press 1st 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		
1) chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ncert.nic.in/vocational/pdf/kees101.pdf 2) chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://baou.edu.in/assets/pdf/BCADES_201_slm.pdf		
MOOC / NPTEL/YouTube Links		
1) https://www.youtube.com/results?search_query=introduction+in+english 2) https://www.youtube.com/watch?v=zAlt3VbkL6g 3) https://www.youtube.com/watch?v=0l69KEx7GQo 4) https://www.youtube.com/watch?v=smgyeUomfyA 5) https://www.youtube.com/watch?v=GY3ADgnWLos 6) https://www.youtube.com/watch?v=yRwmr7CqnrY 7) https://www.youtube.com/watch?v=eIho2S0ZahI		

8) 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 Grammar
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	02
7	Conducting & Attending Meeting	02
8	Practice on Business Correspondence	02

Learning Resources:

Reference Books

- 1) Communication Skills Meenakshi Raman and Sangeeta Sharma Oxford University Press 1st 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

- 1) <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ncert.nic.in/vocational/pdf/kees101.pdf>
- 2) chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://baou.edu.in/assets/pdf/BCADES_201_slm.pdf

MOOC / NPTEL/YouTube Links

- 1) https://www.youtube.com/results?search_query=introduction+in+english
- 2) <https://www.youtube.com/watch?v=zAIt3VbkL6g>
- 3) <https://www.youtube.com/watch?v=0l69KEx7GQo>
- 4) <https://www.youtube.com/watch?v=smgYeUomfyA>
- 5) <https://www.youtube.com/watch?v=GY3ADgnWLos>
- 6) <https://www.youtube.com/watch?v=yRwmr7CqnrY>
- 7) <https://www.youtube.com/watch?v=eIho2S0Zahl>
- 8) 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
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 al 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
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 the students 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 tools necessary in smithy welding and sheet metal working and apply them practically.	
CO2	Learn the techniques, skills, and modern engineering tools necessary for fitting and carpentry operations and Possess knowledge of measurement and measuring instrument.	
CO3	Demonstrate proficiency in using various tools to complete small products, enhancing precision fitting & assembly skills for fabricating components.	
Course Description: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical 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 operations like, 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 electrode classification and coding, welding joints, and preparation of welding component.	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:		
Text Books		
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, New Delhi		
MOOC / NPTEL/YouTube Links		
1) .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: 00 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

- 1) Democracy, Elections and Good Governance in India by Rede G. D., Rohit S. Shelar, Jyoti Chaudhary & Saurav Singl
- 2) Indian Polity by *M. Laxmikanth*
- 3) Democracy and Governance in India by Subhash C. Kashyap
- 4) 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 of fuel and corrosion.		
Course Objectives: The objective of the course is to 1) Develop an interest among the students regarding applied and engineering chemistry. 2) Study the different water quality parameters and its applications in engineering field. 3) Apply the instrumental methods for analysis of different chemical substances. 4) Analyze characteristics of fuels 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	07 Hrs
Introduction, Impurities in natural water, Water quality parameters, Hardness of water, Types of hardness, Units of hardness. Ill effects of hard water in steam generation in boilers – Sludge & Scale formation. Numerical on hardness, treatment of hard water- ion exchange and reverse osmosis		
Unit2	Instrumental methods of chemical analysis	06 Hrs
Introduction of instrumental methods, 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, instrumentation and applications. Advantages and disadvantages of instrumental methods.		
Unit3	Engineering materials	07 Hrs
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)		
Unit4	Fuels	07 Hrs
Introduction, Definition, Classification, Properties of fuels. Characteristics of good fuels, Comparison between solid, liquid and gaseous fuels, Calorific value (higher and lower), Bomb calorimeter and Boy's calorimeter. Numerical on Bomb and Boy's calorimeter Fuel Cells :Definition, Classification of fuel cells, Working of Solid oxide fuel cell (SOFC), Limitations and applications of fuel cells.		
Unit 5	Corrosion and its Prevention	07 Hrs
Introduction, Causes, Classification, Factors affecting rate of corrosion, Corrosion prevention methods – Proper design and material selection, Cathodic protection, Protective coatings – Metallic coatings such as Hot dipping – Galvanizing and Tinning, Electroplating, Metal Spraying.		
Unit6	Chemical Equilibrium	05 Hrs
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.		
Learning Resources:		
Text Books 1) Text book of Engineering Chemistry by S. S. Dara and S. S. Umare, S. Chand and Company Lit., New Delhi. 2) Text book of Engineering Chemistry by Shashi Chawla, Dhanpat Rai & Co. (Pvt.) Lit, Delhi 3) Text book of Engineering Chemistry by Dr. Mrs. Jayshree Parikh, Tech-Max Publication Pune.		
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 Chatwal and 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.		

Text Books

- 1) Text book of Engineering Chemistry by Shashi Chawla, Dhanpat Rai & Co. (Pvt.) Lit, Delhi
- 2) Text book of Engineering Chemistry by S. S. Daraand S. S. Umare, S. Chand and Company Lit., New Delhi
- 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
- 2) <https://nptel.ac.in/courses/105104102>
- 3) <https://archive.nptel.ac.in/courses/102/107/102107028/>
- 4) <https://onlinelibrary.wiley.com/journal/2365709X>
- 5) <https://nptel.ac.in/courses/113/105/113105057/>
- 6) <https://www.energy.gov/eere/fuelcells/types-fuel-cells>
- 7) <http://www.nptelvideos.in/2012/11/engineering-chemistry-1.html>
- 8) <https://www.electrochem.org/corrosion-science/>
- 9) <https://nptel.ac.in/courses/113/108/113108051/>
- 10) <https://www.britannica.com/science/phase-rulehttps://nptel.ac.in/courses/113/104/113104068/>
- 11) <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 of fuel and corrosion.

Course Objectives: The objective of the course is to,

- 1) Develop an interest among the students regarding applied and engineering chemistry.
- 2) Study the different water quality parameters and its applications in engineering field.
- 3) Apply the instrumental methods for analysis of different chemical substances.
- 4) Analyze characteristics of fuels 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

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) Text book of Engineering Chemistry by S. S. Dara and S. S. Umare, S. Chand and Company Lit., New Delhi
- 2) Text book of Engineering Chemistry by Shashi Chawla, Dhanpat Rai & Co. (Pvt.) Lit, Delhi
- 3) Text book of Engineering Chemistry by Dr. Mrs. Jayshree Parikh, Tech-Max Publication Pune.

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 Chatwal and 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) Textbook of Engineering Chemistry by Shashi Chawla, Dhanpat Rai & Co. (Pvt.) Lit, Delhi
- 2) Textbook of Engineering Chemistry by S. S. Dara and S. S. Umare, S. Chand and Company Lit., New Delhi
- 3) Engineering Chemistry by Jain and Jain, Dhanpat Rai Publishing Company Ltd., New Delhi.

MOOC / NPTEL/YouTube Links VLab Link:

- 1) Experiment name-Determination of Viscosity ([Lab Name](http://vlab.amrita.edu/?sub=2&brch=190&sim=339&cnt=1)-Viscosity virtual lab)
<http://vlab.amrita.edu/?sub=2&brch=190&sim=339&cnt=1>
- 2) Experiment name-Water Analysis-Physical Parameter ([Lab Name](#)-Inorganic Chemistry)

- 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) Experiment name-Acid Base Titration (Lab Name-Inorganic Chemistry virtual lab) <http://vlab.amrita.edu/?sub=2&brch=193&sim=352&cnt=1>
- 5) Experiment name-Soil Analysis (Lab Name-Inorganic Chemistry virtual lab) <http://vlab.amrita.edu/?sub=2&brch=193&sim=1549&cnt=1>
- 6) Experiment name- Alloy Analysis (Brass) (Lab Name – Inorganic Chemistry virtual 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: 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 Content		
Unit-1	Differential equation of first order first degree and Applications	8 Hrs
- 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 Hrs
- Eulers Method - Eulers modified Method - Runge-Kutta Method of order four - Taylor Series Method		
Unit-3	Multiple Integrations	8 Hrs
- 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 Hrs
• 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 Hrs
• Gamma Function and properties • Beta function and properties • Differentiation Under Integral Sign (with constant limits only)		
Unit-6	Numerical Integration	7 Hrs
• 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,40 th 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:

- 1) Trigonometric identities and Logarithmic identities
- 2) Differentiation and integration formulae
- 3) 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 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 and Weddles rule	2

Learning Resources:	
Text Books	
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, Vidyarthi Griha 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: 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 go to 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
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	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. 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	
2	Write a C Program to demonstrate the working of Arithmetic operations using arithmetic operators in C.	2	
3	Write a C Program to do the following using relational operators and branching statement: 1. Read two integers and check if they are equal or not. 2. Print the greater of Two numbers.	2	

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 7. Fail - Below 40	2
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
6	Write a C Program to demonstrate looping statements. Find the Factorial by given a number. Count total number of digits for a given integer number. Find the Sum of Digits in a given number. Reverse the given integer number and display the same on the output screen.	2
7	Write a C program to read N numbers in an integer array and Print it in reverse order.	2
8	Write a C program to read N numbers in an array and display the sum of array elements.	2
9	Write a program to read two matrices and store the addition Of two matrices in the third matrix.	2
10	Write a C Program to swap two numbers using call by value.	2

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 know secondary school mathematics. Learners should know the “Mechanics” section from Physics 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	Fundamentals of Statics	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	Equilibrium of Forces	05
Basic concept of equilibrium, Equilibrium conditions, Lami’s Theorem, Free Body Diagram, Equilibrium of spheres.		
Unit-3	Equilibrium of Beams	04
Types of Loads, Types of supports, types of beam, Analysis of Simple beams, Support reactions.		
Unit-4	Centroid	05
Centroid and Centre of Gravity, Centroid of Standard shapes, Numerical on centroid of given diagram		
Unit-5	Moment of Inertia	05
Moment of Inertia of Standard shapes from first principle, Parallel and perpendicular axis theorem, Moment of Inertia of plain and composite figures, Radius of Gyration		

Unit-6	Impact and Collision of elastic bodies	04
Impact, Types of Impact, Law of conservation of Momentum, Coefficient of Restitution , Numerical on 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
Practical: 02 Hours/Week	01	ISA: 25 Marks
Prerequisites, if any: 1) Learners should know secondary school mathematics 2) 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 the resultant of concurrent coplanar force system graphically.	
CO2	Analyze the force the given force system.	
CO3	Verify the law of moment of given force system.	
CO4	Determine the support reactions of the given beam.	
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	Law of polygon of forces	02
2	Jib crane	02
3	Bell crank lever	02
4	Support Reactions of Beam	02
5	To find Resultant by Graphical Method	02
6	To find Support Reactions by Graphical Method	02
7	Assignment on finding Resultant	02
8	Assignment on Equilibrium of Sphere	02
9	Assignment on Finding support reactions of beam	02
10	Assignment on finding Centroid of given shape	02
11	Assignment on finding Moment of Inertia of given shape	02

12	Assignment on impact of elastic bodies	02
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.		
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 of Thermodynamics
- 3) Basics of energy sources

Course Objectives: The objective of the course is to

- 1) Acquire basic knowledge of mechanical engineering
- 2) Impart knowledge of basic concepts 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 run the world. This course describes the applications of Mechanical Engineering in many relative 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	Introduction to IC Engine	04Hrs
Introduction, Classification of IC engines, functions of major components of IC engine and terms used in IC engine, Construction and Working of four strokes S.I. and C.I. engines, Construction and Working Two stroke engines, Applications.		

Unit-3	Introduction to Refrigeration & Air Conditioning	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	Energy Sources and power plants	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	Mechanical Power Transmission and Energy conversion 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	Manufacturing Processes	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 S. D. Ambatkar, Tech Knowledge 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 Patel and Karam chandani, Acharya Book Depot. 3) Power Plant Engineering by Arora and Domkunwar, Dhanpat Rai and Sons 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: 2501UFYEEESC113T Course Name: Basic Mechanical Engineering Lab

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

Prerequisites, if any:

- 1) Theory knowledge of types and components of IC engine.
- 2) Theory knowledge of types and components of refrigeration and air conditioning system.
- 3) 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) Understand the functions of power transmitting devices with the demo models.
- 4) Understand the working and operation of Lathe Milling and Drilling machines 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, equipment and 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.	4
2	Demonstration of I.C. engine (SI, CI, 2 stroke and 4 stroke)	4
3	Demonstration of vapour compression refrigeration system (VCRS), VARS and window air conditioner.	4
4	Demonstration of various power plants such as Windmill / Biogas / Hydroelectric Power Plant etc.	4
5	Demonstration of belt drive, chain drive, gear trains and centrifugal pump	4
6	Demonstration of casting, metal removal and metal joining processes	4

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 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 Patel and Karamchandani, Acharya Book Depot. 3) Power Plant Engineering by Arora and Domkunwar, Dhanpa Rai and Sons 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: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 Hrs
• 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 Hrs
• 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 Hrs

• 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 Hrs
• 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		
Text Books		
1) Introduction to Indian Knowledge System: Concepts and Applications by B. Mahadevan, Vinayak Rajat Bhat, and Nagendra Pavana R.N. 2) Roots of Wisdom: Understanding Indian Knowledge System by Dr. Alok Tripathi. 3) Indian Knowledge Systems (IKS): A Legacy of Wisdom and Innovation by Dr. Dheeraj Mehrotra.		
e-Books		
4) https://iksindia.org/ebook.php 5) https://pcte.edu.in/wp-content/uploads/2025/03/E-Book-1.pdf		
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: 2501UFYEHSSM202Course 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	03 Hrs
• Importance of Planning and Managing Career (SWOC Analysis) • Job Application and Resume/CV/Bio data • Group Discussion • Corporate Etiquettes & Manners		
Unit-2	Behavioural Skills	05 Hrs
• Understanding Self: Self Esteem • Personality Types and Traits • Time Management & Stress Management • Positive Attitude Building • Emotional Intelligence		

Unit-3	Technical Writing Skills	04 Hrs
• Importance and Objectives of Technical Writing • Structure and Types of Reports (Investigation and Accident Report) • Corporate Email Writing: Dos & Don'ts		
Unit-4	Developing Presentation Skills	02 Hrs
• Techniques of Public Speaking • Speeches for Various Occasions: • Welcome Speech, Introduction of a Guest, Vote of Thanks • Mock Personal Interview		
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 5) www.buisnesscommunicationskills.com, 6) www.kcitraing.com www.mindtools.com 7) https://uk.indeed.com/career-advice/career-development/behavioral-skills		

- 8) www.slite.com/learn/technical-writing
- 9) www.in.indeed.com/career-advice/finding-a-job/what-does-technical-writer-do
- 10) <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
2	Group Discussion	02
3	Debate	02
4	Extempore or Pep talk	02
5	Speeches for Various Occasions	02
6	Email Writing	02
7	Practice on Technical Writing	02
8	Mock Interview	02
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 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
- 5) www.buisnesscommunicationskills.com,
- 6) www.kcitraing.com www.mindtools.com
- 7) <https://uk.indeed.com/career-advice/career-development/behavioral-skills>
- 8) www.slite.com/learn/technical-writing
- 9) www.in.indeed.com/career-advice/finding-a-job/what-does-technical-writer-do
- 10) <https://www.oxfordsummercourses.com/articles/how-to-improve-your-presentation-skills>
- 11) www.buisnesscommunicationskills.com,
- 12) www.kcitraing.com, www.mindtools.com

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.

Evaluation and Assessment Sheet

(To be filled in by mentor)

Sr. No.	Details	Maximum Marks	Marks Obtained
1.	Problem Identification (Idea Inception)	05	
2.	Problem Analysis (Requirement Gathering)	05	
3.	Proposed Solution (Model/Design/Process/prototype)	05	
4.	Report	10	
5.	Presentation	25	
Total Marks		50	