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 2026-27 Onwards

Shree Warana Vibhag Shikshan Mandal's

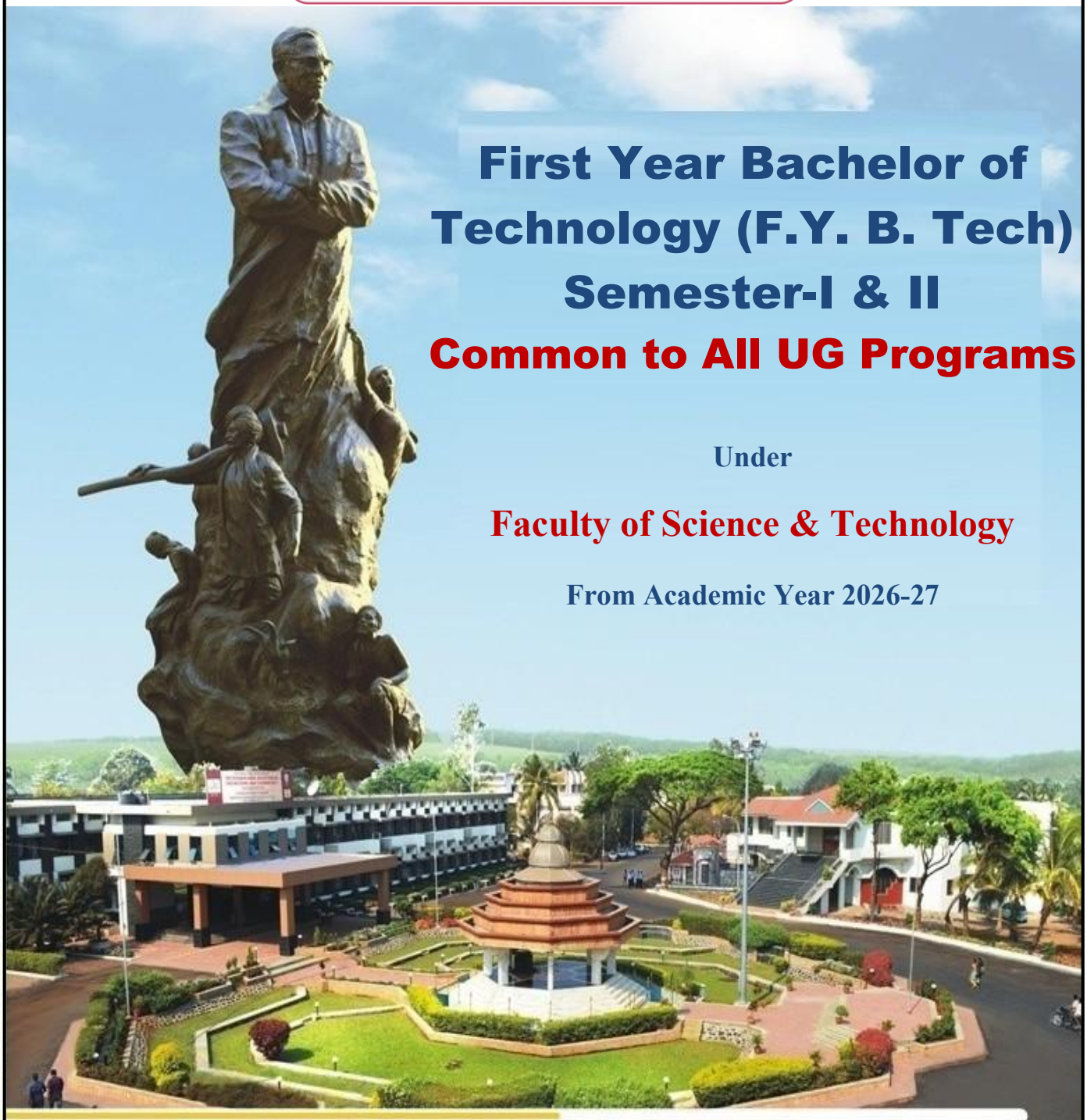
TATYASAHEB KORE INSTITUTE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS), WARANANAGAR, KOLHAPUR

TKIET
Estd. 1983



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 2026-27

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 2026-27. 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
IE	Internal Evaluation
MSE	Mid Semester Examination
ESE	End Semester Examination
ISA	In-Semester Assessment (Term Work)
OE	Oral Examination
POE	Practical & Oral Examination
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

The examination will be conducted semester wise and will be consisting of either/ all of the following (As prescribed in thes tructure):

A. For theory courses the examination scheme includes, Internal Evaluation (IE), Mid Semester Exam (MSE) and End Semester Examination (ESE).

B. For laboratory / tutorial courses the examination scheme includes following

1) In Sem Assessment (ISA)
and/or

2) Practical and Oral Examination (POE) or Oral Examination (OE)

A. Theory Course Assessment Methods:

1) Each theory course consists of 6 units with few exceptional courses.

2) The weightage for different evaluation tools are IE 20%, MSE 20%, and ESE 60%. The nature of IE is mentioned in the following table

I. Internal Evaluation (IE) [20%]:

a) Use any two evaluation tools from the following list (10 marks each). However, the first and second evaluation tools selected must be different.

b) The evaluation tools shall be selected by the subject teacher/mentor in consultation with the Head of Department (HOD), considering the level/year of study of the students and the nature of the course.

c) Evaluation Tool–1 shall cover Units 1, 2, and 3, whereas Evaluation Tool–2 shall cover Units 4, 5, and 6.

Year	Evaluation Tools Available (Course Teacher has to choose any 2)
1st Year (Sem I & II)	Home Assignment, Class Assignment, Open Book Test, Quiz, MCQ Test

II. Mid Semester Exam (MSE) [20%]:

a) MSE examination should be monitored by the Central Examination Coordinator after approximately half of the semester is completed. The MSE will be of 50 marks. However, the marks obtained by the student shall be proportionately converted into 20 marks for final assessment.

b) The syllabus for the MSE shall cover Unit 1, Unit 2, and Unit 3.

c) Nature of Question Paper for MSE:

i) The MSE will be conducted for 50 Marks with a duration of 1.5 Hours.

ii) The question paper shall comprise one question each on Unit 1, Unit 2, and Unit 3.

iii) Of the three questions, any one question shall carry 18 Marks, and the remaining two questions shall carry 16 Marks each (18 + 16 + 16 = 50 Marks).

iv) All three questions shall be compulsory. However, each question may provide internal options. total marks carrying such internal options do not exceed 35% of the total 50

Marks (i.e., not exceeding approximately 17 Marks).

v) Questions shall be framed so as to assess different cognitive levels of Bloom's Taxonomy (viz. Remember, Understand, Apply, Analyze, Evaluate, and Create).

III. End Semester Exam (ESE) [60%]:

a) ESE will be based on the entire syllabus and will be conducted for 60 marks and duration of each exam will be 2 hours.

b) For the End Semester Examination (ESE), Units 1, 2, and 3 shall carry 30% weightage, whereas Units 4, 5, and 6 shall carry 70% weightage.

c) ESE question paper setting shall be as per the format given below.

Nature of Question Paper

Total Marks: 60
Time: 02 Hours

All questions are compulsory

Q. No.			Marks	BL	CO
1	Attempt the following.		18		
	a	Unit -1			
	b	Unit -2			
	c	Unit -3			
3	Attempt any two of the following.		14		
	a	Unit -4			
	b	Unit -4			
	c	Unit -4			
4	Attempt any two of the following.		14		
	a	Unit -5			
	b	Unit -5			
	c	Unit -5			
5	Attempt any two of the following.		14		
	a	Unit -6			
	b	Unit -6			
	c	Unit -6			

* For specific courses, the nature of the question paper may vary based on the pedagogical and assessment requirements of the respective course with approval of concerned HOD.

* Questions shall be framed so as to assess different cognitive levels of Bloom's Taxonomy (viz. Remember, Understand, Apply, Analyze, Evaluate, and Create).

B. Laboratory/Tutorial Course Assessment Methods:

I. In Sem Assessment (ISA):

Laboratory/Tutorial Work Assessment Criteria

Assessment Criteria Description	Weightage
Assessment of Journal (Punctuality) / Laboratory Experiments Journal Writing / Performance in Lab	40%
Assessment of Regular Notebook /Survey report about Lab Course / Interview related to Lab work / Oral based on Lab Course / Individual Industrial Visit for Lab Course	20%
Seminar Based on Laboratory Work / Demonstration Based on Laboratory Work / Implementation on Lab Safety & Discipline / Lab Experiment Model Preparation	20%
Regular Attendance for Lab	20%

* Course teacher can use above mentioned criteria and weightage or he may use modified criteria and weightage as per the nature of content in syllabus of his concerned practical/tutorial course.

II. Oral Examination (OE):

OE Assessment Criteria

Assessment Criteria Description	Weithtage
Understanding of concepts	25%
Analytical/Problem solving ability	25%
Innovative/Critial thinking	25%
Ability to communicate/express	25%

* The course teacher may use the above-mentioned assessment criteria and weightage or may adopt modified criteria and weightage as deemed appropriate to meet the pedagogical and assessment requirements of the respective course.

III. Practical Oral Examination (POE):

POE Assessment Criteria

Assessment Criteria Description	Weithtage
Experiment planning & execution	60%
Experimental writeup	20%
Performance in oral (Viva-Voce)	20%

* Course teacher can use above mentioned weightage of marks or he may decide the weightage for POE as per the nature of content in syllabus of his concerned practical course.

Passing criteria:

1) Passing with a minimum of 40% marks in the ESE for theory course is mandatory. The duration of the ESE examination will be 2:00 hours, and for certain courses (as mentioned in the syllabus), it will be 2:30 hours. Passing with a minimum of 40% marks in IE for theory course is mandatory. In addition to passing in ESE & IE combined passing with a minimum of 40% marks in MSE, IE, and ESE is required. There is no separate passing requirement for MSE.

2) If a student fails to secure the required combined 40% marks in a course, the student shall be declared failed in that course. To pass the course, the student must reappear for the End Semester Examination (ESE) and obtain sufficient marks to satisfy the combined 40% passing requirement. The marks obtained in the Mid Semester Examination (MSE) and Internal Evaluation (IE) are final and shall not be revised, improved, or re-evaluated after the completion of the respective semester. Therefore, a student who falls short of the required combined 40% marks must secure the necessary additional marks through the ESE only.

3) Separate passing with a minimum of 40% marks in ISA and/or POE/OE for laboratory course is mandatory.

4) Student should clear all first year passing heads before admits to third year and clear all second year passing heads before admits to fourth year.

5) Aggregate of a particular year (both thesemesters) shall be considered as a separate head of passing for the result of that concerned year and 45% aggregate score is mandatory. The student not fulfilling this criterion can improve the score of 45% aggregate through appearing in re-examination for maximum of three theory courses.

6) If student fails to improve thescore of 45% aggregate through appearing in re-examination then he/she can improve the score of 45% aggregate by re- appearing in subsequent concern odd semesters (3, 5, 7) or concern even semesters (4, 6, 8) ESE of theory course examination in next academic year.

Eligibility criteria for End Semester Examination:

A student shall secure a minimum **40%** marks in **IE** and **ISA** of a particular course and minimum **75%** attendance for lectures and lab sessions otherwise he/she shall not be eligible for ESE.

Grading System:

The Semester Grade Point Average (SGPA) shall be calculated for each semester and Cumulative Grade Point Average (CGPA) shall be calculated at the end of all semesters.

The standard of passing shall be in accordance with the following table:

Table1: Conversion of Marks out of 100 to grade point (Passing: 40)

Sr. No	Marks Range out of 100	Grade point	CGPA	Letter Grade
1	Detained	0 (zero)	–	D: Detained
2	Absent	0 (zero)	–	AB: Absent
3	0 – 39	0 (zero)	0.0 – 4.20	F: Fail
4	40 – 44	4	4.21 – 4.72	P: Pass
5	45 – 49	5	4.73 – 5.25	C: Average
6	50 – 59	6	5.26 – 5.78	B: Above Average
7	60 – 69	7	5.79 – 6.31	B+: Good
8	70 – 79	8	6.32 – 7.54	A: Very Good
9	80 – 89	9	7.55 – 8.77	A+: Excellent
10	90-100	10	Above 8.77	O: Outstanding

***** Conversion of marks out of 150, 75, 50, 25 etc. should be converted using above table.

Note: The award of the final Grade for the degree of B.Tech. shall be calculated based on CGPA.

Calculation of SGPA and CGPA:

1. Semester Grade Point Average **(SGPA)**

$$\boldsymbol{SGPA} = \frac{\sum(Course\ credits\ \times Grade\ points\ obtained)\ of\ a\ Semester}{\sum(Course\ credits)\ of\ respective\ Semester}$$

2. Cumulative Grade Point Average **(CGPA)**

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

- Marks obtained > = 0.5 shall be rounded off to next higher digit.
- The SGPA & CGPA shall be rounded off to 2 decimal points.
- CGPA will be calculated cumulatively from Sem. I to Sem. VIII for regular students and from Sem. III to Sem. VIII for lateral entry students.

Note: An equivalent certificate of CGPA to percentage of marks will be provided to student on candidate's demand after remitting prescribed fees by Warana University.

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	Component	Mark	Min for Passing
BSC	2601UFYEBSC101	Engineering Physics	3	-	-	3	3	IE	20	8
								MSE	20	-
								ESE	60	24
	2601UFYEBSC101T	Engineering Physics Lab	-	-	1	2	1	ISA	25	10
	2601UFYEBSC102	Engineering Mathematics-I	3	-	-	3	3	IE	20	8
								MSE	20	-
								ESE	60	24
	2601UFYEBSC102T	Engineering Mathematics-I Tutorial	-	1	-	1	1	ISA	25	10
ESC	2601UFYEESC103	Basic Electrical and Electronics Engineering	2	-	-	2	2	IE	20	8
								MSE	20	-
								ESE	60	24
	2601UFYEESC103T	Basic Electrical & Electronics Engineering Lab	-	-	1	2	1	ISA	25	10
	2601UFYEESC104	Basic Civil Engineering	2	-	-	2	2	IE	20	8
								MSE	20	-
								ESE	60	24
	2601UFYEESC104T	Basic Civil Engineering Lab	-	-	1	2	1	ISA	25	10
	2601UFYEESC105	Computer Aided Engineering Drawing	2	-	-	2	2	IE	20	8
								MSE	20	-
								ESE	60	24
	2601UFYEESC105T	Computer Aided Engineering Drawing Lab	-	-	1	2	1	ISA	25	10
HSSM	2601UFYEHSSM1061/ 2601UFYEHSSM1062	Communication Skills / German Language I	1	-	-	1	1	IE	15	6
								MSE	20	-
								ESE	40	16
	2601UFYEHSSM1061T/ 2601UFYEHSSM1062T	Communication Skills lab / German Language I Lab	-	-	1	2	1	ISA	25	10
CC	2601UFYECC107T	Artificial Intelligence & Cyber Security Lab	-	-	1	2	1	ISA	25	10
VSEC	2601UFYEVSEC108T	Manufacturing Techniques Lab	-	-	1	2	1	ISA	50	20
MAC	2601UFYEMAC109A	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	Component	Mark	Min for Passing	
BSC	2601UFYEBSC110	Engineering Chemistry	3	-	-	3	3	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UFYEBSC110T	Engineering Chemistry Lab	-	-	1	2	1	ISA	25	10	
	2601UFYEBSC201	Engineering Mathematics-II	3	-	-	3	3	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UFYEBSC201T	Engineering Mathematics- II Tutorial	-	1	-	1	1	ISA	25	10	
PCC	2601UFYEPCC111	Computer Programming in C	2	-	-	2	2	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UFYEPCC111T	Computer Programming in C Lab	-	-	1	2	1	ISA	25	10	
ESC	2601UFYEESC112	Engineering Mechanics	2	-	-	2	2	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UFYEESC112T	Engineering Mechanics Lab	-	-	1	2	1	ISA	25	10	
	2601UFYEESC113	Basic Mechanical Engineering	2	-	-	2	2	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UFYEESC113T	Basic Mechanical Engineering Lab	-	-	1	2	1	ISA	25	10	
IKS	2601UFYEIKS114T	Indian Knowledge System	1	-	-	1	1	ISA	25	10	
HSSM	2601UFYEHSSM2021/ 2601UFYEHSSM2022	Employability Enhancement Skills / German Language II	1	-	-	1	1	IE	15	6	30
								MSE	20	-	
								ESE	40	16	
	2601UFYEHSSM2021T/ 2601UFYEHSSM2022T	Employability Enhancement Skills Lab / German Language II Lab	-	-	1	2	1	ISA	25	10	
CC	2601UFYECC115T	Inquisitive Learning	-	-	1	2	1	ISA	25	10	
								Presentation	25	10	
Total			**14**	**1**	**6**	**27**	**21**		**800**		

First Year B. Tech

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	Component	Marks	Min % for Passing
BSC	2601UFYEBSC110	Engineering Chemistry	3	-	-	3	3	IE	20	8
								MSE	20	-
								ESE	60	24
										40
	2601UFYEBSC110T	Engineering Chemistry Lab	-	-	1	2	1	ISA	25	10
	2601UFYEBSC102	Engineering Mathematics-I	3	-	-	3	3	IE	20	8
								MSE	20	-
								ESE	60	24
										40
	2601UFYEBSC102T	Engineering Mathematics- I Tutorial	-	1	-	1	1	ISA	25	10
PCC	2601UFYEPCC111	Computer Programming in C	2	-	-	2	2	IE	20	8
								MSE	20	-
								ESE	60	24
										40
	2601UFYEPCC111T	Computer Programming in C Lab	-	-	1	2	1	ISA	25	10
ESC	2601UFYEESC112	Engineering Mechanics	2	-	-	2	2	IE	20	8
								MSE	20	-
								ESE	60	24
										40
	2601UFYEESC112T	Engineering Mechanics Lab	-	-	1	2	1	ISA	25	10
	2601UFYEESC113	Basic Mechanical Engineering	2	-	-	2	2	IE	20	8
								MSE	20	-
								ESE	60	24
										40
	2601UFYEESC113T	Basic Mechanical Engineering Lab	-	-	1	2	1	ISA	25	10
HSSM	2601UFYEHSSM1061/ 2601UFYEHSSM1062	Communication Skills / German Language I	1	-	-	1	1	IE	15	6
								MSE	20	-
								ESE	40	16
										30
	2601UFYEHSSM1061T/ 2601UFYEHSSM1062T	Communication Skills lab / German Language I Lab	-	-	1	2	1	ISA	25	10
IKS	2601UFYEIKS114T	Indian Knowledge System	1	-	-	1	1	ISA	25	10
CC	2601UFYECC115T	Inquisitive Learning	-	-	1	2	1	ISA	25	10
								Presentation	25	10
MAC	2601UFYEMAC109A	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	2601UFYEBSC101	Engineering Physics	3	-	-	3	3	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UFYEBSC101T	Engineering Physics Lab	-	-	1	2	1	ISA	25	10	
	2601UFYEBSC201	Engineering Mathematics-II	3	-	-	3	3	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UFYEBSC201T	Engineering Mathematics-II Tutorial	-	1	-	1	1	ISA	25	10	
ESC	2601UFYEESC103	Basic Electrical and Electronics Engineering	2	-	-	2	2	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UFYEESC103T	Basic Electrical & Electronics Engineering Lab	-	-	1	2	1	ISA	25	10	
	2601UFYEESC104	Basic Civil Engineering	2	-	-	2	2	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UFYEESC104T	Basic Civil Engineering Lab	-	-	1	2	1	ISA	25	10	
	2601UFYEESC105	Computer Aided Engineering Drawing	2	-	-	2	2	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UFYEESC105T	Computer Aided Engineering Drawing Lab	-	-	1	2	1	ISA	25	10	
HSSM	2601UFYEHSSM2021/ 2601UFYEHSSM2022	Employability Enhancement Skills / German Language II	1	-	-	1	1	IE	15	6	30
								MSE	20	-	
								ESE	40	16	
	2601UFYEHSSM2021T/ 2601UFYEHSSM2022T	Employability Enhancement Skills Lab / German Language II Lab	-	-	1	2	1	ISA	25	10	
CC	2601UFYECC107T	Artificial Intelligence & Cyber Security Lab	-	-	1	2	1	ISA	25	10	
VSEC	2601UFYEVSEC108T	Manufacturing Techniques Lab	-	-	1	2	1	ISA	50	20	
Total			**13**	**1**	**7**	**28**	**21**		**800**		

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

Course Code:2601UFYEBSC101 Course Name: Engineering Physics

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 03 Hours/Week	**03**	**IE: 20 Marks** **MSE 20 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 Fraunhoffer diffraction by double slit, Resolving power of plane transmission grating, Polarization of light, double refraction, Huygens' theory of double refraction, Specific Rotation, Quarter wave plate and half wave plate, Laurent's half shade polarimeter, Numerical.		
Unit-6	**LASER and Nuclear Physics**	**6 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 Kittle, Introduction to Solid State Physics - Wiley India Pvt. Ltd.
6) Alan Giambattista and others- Fundamentals of physics, Tata Mc. Graw Hills
7) Vijay Kumari- Engineering Physics, Vikas Publications
8) Resnick Halliday, Physics Volume-I, Krane -John Wiley & Sons Pub.
9) Resnick Halliday, Physics Volume-II, Krane -John Wiley & Sons Pub.
10) Hitendra K. Malik, A. K. Singh – Engineering Physics - Tata Mc. Graw Hills Education Private Ltd.
11) A. Beiser – Concepts of Modern Physics - Tata Mc. Graw Hills
12) L. J. Schiff – Quantum Mechanics - Tata Mc. Graw Hills

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: 2601UFYEBSC101T 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: 2601UFYEBSC102 Course Name: Engineering Mathematics-I

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 03 Hours/Week	**03**	**ISE: 20 Marks** **MSE 20 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 θ and cos θ in powers of sin θ and /or cos θ, 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:2601UFYEBSC102TCourse 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 sinnθ and cosnθ in powers of sinθ and cosθ
CO4	**Estimating** the value of a function for the given value of the independent variable
CO5	**Solve** system of linear equations using numerical methods
CO6	**Calculate** partial derivative and apply it to find extreme values of function of two variable

Course Description:

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

Course Content

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

Learning Resources:

Text Books

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

Reference Books

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

MOOC / NPTEL/YouTube Links

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

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

Course Code: 2601UFYEESC103 Course Name: Basic Electrical and Electronics Engineering

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 02 Hours/Week	**02**	**ISE: 20 Marks** **MSE: 20 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'sLaw, generation of sinusoidal voltage, Analysis of pure Resistive, Inductive, Capacitive circuits, Analysis of series R-L, R-C, R-L-C circuits. (NumericaltreatmentonseriesR-L,R-C,R-L-Ccircuits)		
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–c engage learning.
2) B. H. Deshmukh, Electrical Engineering Concepts and applications
3) Robert L. Boysted and Louis Nashelsky, Electronics devices and circuit theory– Pearson education

Reference Books

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

MOOC / NPTEL/YouTube Links

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

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

Course Code: 2601UFYEESC103T 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: 2601UFYEESC104 Course Name: Basic Civil Engineering

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 02 Hours/Week	**02**	**ISE: 20 Marks** **MSE: 20 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**	**05 Hrs**

	Planning	
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, DhanpatRai Publications

Reference Books

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

MOOC / NPTEL/YouTube Links

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

E Books

1) https://share.google/FC30NwdMCPmF4DqD8

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

Course Code:2601UFYEESC104T Course 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=IKa6b55t5M9k581d

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

Course Code: 2601UFYEESC105 Course Name: Computer Aided Engineering Drawing

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 03 Hours/Week	**02**	**ISE: 20 Marks** **MSE: 20 Marks** **ESE: 60 Marks**

Prerequisites, if any:

Basic Engineering Drawing Knowledge, Computer Basics, Visualization Ability etc

Course Objectives: The objective of the course is to

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

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

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

Course Description:

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

Course Content

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

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

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

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

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

Orthographic projection system, First angle projection methods, Concept of Projection –Projection

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

Learning Resources:

Text Books

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

Reference Books

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

e-Books

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

MOOC/NPTEL/YouTube Links

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

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

Course Code:2601UFYEESC105T 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, SolidusingAutoCAD
CO3	**Create** orthographic projectionusingAutoCAD
CO4	**Visualize** and develop surfaces of solids usingAutoCAD.

Course Description:

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

Course Content

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

Learning Resources:

Text Books

1) Engineering Drawing by N. D. Bhatt, Charotor Publication House, Bombay
2) Machine Drawing by N. D. Bhatt, Charotor Publication House, Bombay.
3) Engineering Drawing and Graphics Using AutoCAD by T. Jeyapoovan, Vikas Publication.

A text book of Engineering Drawing by R. K. Dhawan, S. Chand and Co.

Reference Books

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

e-Books

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

MOOC/NPTEL/YouTube Links

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

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

Course Code:2601UFYEHSSM1061 Course Name: Communication Skills

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 01 Hours/Week	**01**	**IE: 15 Marks**
		MSE: 20 Marks
		ESE: 40 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

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

e-Books

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=eIho2S0ZahI
8) www.mindtools.com

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

Course Code:2601UFYEHSSM1061T Course Name: Communication Skills Lab

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

Prerequisites, if any:

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

Course Objectives: The objective of the course is to

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

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

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

Course Description:

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

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Hours
1	Ice breaking: Introducing Yourself, star of my life	02
2	Practice on writing General Applications	02
3	Grammar Activities	02
4	Vocabulary Building Exercises	02
5	Vocabulary Building Exercises	02
6	Conducting & Attending Meeting	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 Press1st Edition, 2016
2) Communication Skills for Engineers S. Mishra & C. Muralikrishna, Pearson
3) Basic Communication Skills for Technology Andrea J. Rutherford Pearson Education Asia, Delhi, 2002
4) Mastering Communication Nicky Stanton Palgrave Master Series
5) Speaking Effectively: Developing Speaking Skills for Business English Jeremy Comfort, et al.Cambridge University Press Reprint, 2011
6) Basic Correspondence and Report Writing: A Practical Approach to Business and Technical Communication, R. C. Sharma and Krishna Mohan Tata McGraw-Hill Publishing Co. Ltd., India, 5th Edition, 2017
7) Written Communication in English Saran Freeman Orient Longman
8) The Oxford Guide to Writing and Speaking J. Seely Oxford University Press, India 3rd Edition, 2013
9) High School English Grammar and Composition, Wren and Martin, Blackie, 2000
10) Essential English Grammar (Elementary & Intermediate) Raymond Murphy Cambridge University Press (CUP)
11) English Language Laboratories, Nira Konar, PHI Learning 2014

e-Books

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=eIho2S0ZahI
8) www.mindtools.com

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

Course Code:2601UFYEHSSM1062 Course Name: German Language (Sem-I)

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 01 Hours/Week	**01**	**IE: 15 Marks**
		MSE: 20 Marks
		ESE: 40 Marks

Prerequisites, if any:

1) Adequate knowledge of basic grammar of English language
2) Intermediate level vocabulary of English language
3) Communicate moderately using English language

Course Objectives: The objective of the course is to

1) Acquaint students with basic German Grammar
2) Assist students in developing Vocabulary for basic daily routine topics
3) Understand the slow spoken German and to extract the necessary information out of it
4) Read and understand the basic German texts, notices, e-mails, etc

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

		Bloom's Taxonomy
CO1	Make use of everyday expressions and basic phrases aimed at the satisfaction of needs of a concrete type.	Understand
CO2	Express him/herself and others and ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has etc.	Understand
CO3	Make use of the basic grammar concepts correctly.	Apply
CO4	Demonstrate reading and writing skills.	Apply

Course Description:

This course exposes a learner to LSRW skills of German language. The course takes a student's German language skills to basic level with situational conversations. The course helps learners in creating cross-cultural sensitization and adaptability skills. Here, a student prepares himself for international level German language examination.

Course Content

Unit-1	Basic Introduction of the language and basic introduction	06 Hrs

- Greetings,
- To Introduce oneself,
- speaking about yourself and others,
- numbers,
- age, E-mail address
- Personal Pronomen und Verb conjugation

Unit-2	Freunde, Kollegen und ich	08 Hrs

- Speaking about Hobbies,
- to have an informal appointment,
- learning weekdays,
- months and seasons
- Speaking about professions,
- work and worktimes,
- learning to fill up a profile in German

Unit-3	In Hamburg	06 Hrs

- Learning to name the famous places, buildings in a city,
- learning definite/ indefinite and negative articles in German,
- to name the modes of transportation
- To describe the way, to understand the texts with international words.

Unit-4	Guten Appetit	04 Hrs

- To speak about food,
- to plan a shopping,
- conversation with the shopkeeper

Unit-5	Guten Appetit	04 Hrs

- Conversation about the food,
- about likes and dislikes,
- to understand the “wh” questions.
- Reading comprehension passage

Learning Resources:

Reference Books

1) Studio D – A 1, Cornelsen Verlag, Goyal Publishing House, New Delhi.
2) Tangram aktuell A 1, Goyal Publishing House, New Delhi.
3) Lagune A 1, Goyal Publishing House, New Delhi.
4) Netzwerk A 1, Goyal Publishing House, New Delhi.

e-Books

1) *https://www.klett-sprachen.de/digitales/quizfragen-fuer-kahoot/daf-daz/netzwerk-neu/c-2847?srsltid=AU7gw4WnCg4taEVL-5hNZL57f5Tb7DzwwIN-eqYSpfy0HLH88E2oUzi*

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	3	-	1			
CO2	-	-	-	-	-	-	-	-		3	-	1			
CO3	-	-	-	-	-	-	-	-	-	3	-	1			
CO4	-	-	-	-	-	-	-	2	2	3	-	1			

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

Course Code:2601UFYEHSSM1062T Course Name: German Language Lab (Sem-I)

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

Prerequisites, if any:

1) Adequate knowledge of basic grammar of English language
2) Intermediate level vocabulary of English language
3) Communicate moderately using English language

Course Objectives: The objective of the course is to

1) Acquaint students with basic German Grammar
2) Assist students in developing Vocabulary for basic daily routine topics
3) Understand the slow spoken German and to extract the necessary information out of it
4) Read and understand the basic German texts, notices, e-mails, etc

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

		Bloom's Taxonomy
CO1	Make use of everyday expressions and basic phrases aimed at the satisfaction of needs of a concrete type.	Understanding
CO2	Express him/herself and others and ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has etc.	Understanding & Applying
CO3	Make use of the basic grammar concepts correctly.	Creating

Course Description:

This course exposes a learner to LSRW skills of German language. The course takes a student's German language skills to advanced level with situational conversations. The course helps learners in creating cross-cultural sensitization and adaptability skills. Here, a student prepares himself for German language examination.

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Hours	Cognitive levels of attainment as per Bloom's
1	Introduction in German and asking about basic personal questions to other in Formal and informal way	04	Applying
2	Speaking about hobbys. What one likes the most, what one likes and what one doesn't like	02	Applying
3	Grammar Activities	04	Remembering
4	To speak about Working/studying schedule in German	02	Applying
5	To narrate about own village/town/ city in German	02	Remembering

6	To ask about prices and quantities in Supermarket	04	Applying
7	To speak about own meals, food likes and dislikes	02	Remembering
8	To understand “Wh questions” and to react on the same.	02	Applying

Learning Resources:

Reference Books

1) Studio D – A 1, Cornelsen Verlag, Goyal Publishing House, New Delhi.
2) Tangram aktuell A 1, Goyal Publishing House, New Delhi.
3) Lagune A 1, Goyal Publishing House, New Delhi.
4) Netzwerk A 1, Goyal Publishing House, New Delhi.

e-Books

1) *https://www.klett-sprachen.de/digitales/quizfragen-fuer-kahoot/daf-daz/netzwerk-neu/c-2847?srsltid=AU7gw4WnCg4taEVL-5hNZL57f5Tb7DzwwIN-eqYSpfy0HLH88E2oUzi*

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1							2								
CO2							2			2					
CO3							2								

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

Course Code:2601UFYECC107T Course Name: Artificial Intelligence & Cyber Security Lab

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

Prerequisites, if any:

1) Fundamental knowledge of Computer
2) Fundamental knowledge of Mobile Application.
3) Awareness of internet.

Course Objectives:

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

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

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

Course Description:

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

Course Content

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

Learning Resources:

Text Books

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

Reference Books

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

e-Books

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

MOOC / NPTEL/YouTube Links

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

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

Course Code:2601UFYEVSEC108T 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:2601UFYEMAC109A 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:2601UFYEBSC110 Course Name: Engineering Chemistry

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 03 Hours/Week	**03**	**ISE: 20 Marks** **MSE: 20 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) Developaninterestamongthestudentsregardingappliedandengineeringchemistry.
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 it's Prevention	07 Hrs

Introduction, Causes, Classification, Factors affecting rate of corrosion, Corrosion prevention methods – Proper design and material selection, Catholic protection, Protective coatings – Metallic coatings such as Hot dipping – Galvanizing and Tinning , Electroplating , Metal Spraying.

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. Daraand S. S. Umare, S. Chandand 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) 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: 2601UFYEBSC110T 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) Developaninterestamongthestudentsregardingappliedandengineeringchemistry.
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. Daraand 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 Chatwaland Anand, Himalaya Publishing House, New Delhi
4) Engineering Chemistry by Renu Bapna and Renu Gupta, MacMillan Publishers (India) Ltd,Delhi.
5) Engineering Chemistry by Dr. A. K. Pahari and Dr. B. S. Chauhan, Laxmi Publications (P) Ltd, New Delhi.

e-Books

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

MOOC / NPTEL/YouTube Links VLab Link:

1) Experiment name-Determination of Viscosity (Lab Name-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: 2601UFYEBSC201 Course Name: Engineering Mathematics-II

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 03 Hours/Week	**03**	**ISE: 20 Marks** **MSE: 20 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,40th Edition.

Reference Books

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

MOOC / NPTEL/YouTube Links

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

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

Course Code: 2601UFYEBSC201T 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: 2601UFYEPCC111 Course Name: Computer Programming in C

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 02 Hours/Week	**02**	**ISE: 20 Marks** **MSE: 20 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:2601UFYEPCC111T 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: 2601UFYEESC112 Course Name: Engineering Mechanics

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 02 Hours/Week	**02**	**ISE: 20 Marks** **MSE: 20 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 2601UFYEESC112T 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**theresultantofconcurrentcoplanarforcesystemgraphically.
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: 2601UFYEESC113 Course Name: Basic Mechanical Engineering

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 02Hours/Week	**02**	**ISE: 20 Marks** **MSE: 20 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 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 Pateland 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: 2601UFYEESC113T 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) Understandthefunctionsofpowertransmittingdeviceswiththedemomodels.
4) UnderstandtheworkingandoperationsofLatheMillingandDrillingmachines in machine shop.

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

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

Course Description:

As this subject has huge scope in various industries, so in labs the concept, construction, working and demonstration of various machines, 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 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:2601UFYEIKS114T Course Name: Indian Knowledge System (IKS)

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 01 Hour/Week	01	ISA 25 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:2601UFYEHSSM2021 Course Name: Employability Enhancement Skills

Teaching Scheme	Credit	Evaluation Scheme
Lectures: 01 Hours/Week	**01**	**ISE: 15 Marks**
		MSE 20 Marks
		ESE: 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:2601UFYEHSSM2021T 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
3) Press 2016 1st Edition
4) Lesikar, R. V. and Pettit, J. ,D. Basic Business Communication, McGraw-Hill International Edition, Singapore 10th Edition, 2006
5) Managing Soft Skills for Personality Development by B.N. Ghosh, Tata McGraw Hill,
6) 2012.
7) Bikram K. Das, Kalyani Samantray, "An Introduction to Professional English and Soft
8) Skills" Cambridge University Press New Delhi.
9) Comfort, Jeremy, et al. (2011) Speaking Effectively: Developing Speaking Skills for Business English. Cambridge: Cambridge University Press. (Reprint)
10) Sharma, R. C. and Krishna Mohan, Basic Correspondence and Report Writing: A Practical Approach to Business and Technical Communication, Tata McGraw-Hill Publishing Company Limited, India ,5th Edition, 2017
11) Business Correspondence & Report-writing by R. C. Sharma & Krishna Mohan, Tata McGraw-Hill Education
12) Dr. Abha Singh, "Behavioural Science" Wiley India Pvt.Ltd
13) Soft Skills by K. Alex, S. Chand and Company, 2013

e-Books

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

MOOC / NPTEL/YouTube Links

1) https://onlinecourses.swayam2.ac.in/ntr26_ed53/preview
2) https://onlinecourses.nptel.ac.in/noc26_hs73/preview
3) https://onlinecourses.nptel.ac.in/noc26_hs01/preview
4) https://onlinecourses.nptel.ac.in/noc26_hs55/preview
5) www.buisnesscommunicationskills.com,
6) www.kcitraing.com www.mindtools.com
7) https://uk.indeed.com/career-advice/career-development/behavioral-skills
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:2601UFYECC115T Course Name: Inquisitive Learning (IL)

Teaching Scheme	Credit	Evaluation Scheme
Practical: 02 Hour/Week	**01**	**ISA: 25 Marks** **OE: 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	