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)

Of

Computer Science and Business Systems (CSBS)

Semester- I and II

Sponsored By

Tata Consultancy Services (TCS)

(As Per National Education Policy – 2020)

With Effect from Academic Year 2025-26 Onwards

Shree Warana Vibhag Shikshan Mandal's

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

Estd. 1983

Lead Institute of

WARANA UNIVERSITY, WARANANAGAR

(A State Public University)

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

Computer Science & Business Systems

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Structure and Syllabus as per NEP Policy 2020

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Preface

The Bachelor of Technology in Computer Science and Business Systems (CSBS) program, sponsored by Tata Consultancy Services (TCS), has been designed to address the growing need for professionals who possess not only strong foundations in Computer Science but also an understanding of business domains, management principles, and communication skills. This unique interdisciplinary program aims to bridge the gap between technology and business by nurturing graduates who are industry-ready, adaptable, and capable of driving innovation in the digital economy.

The curriculum emphasizes core computing subjects, data science, artificial intelligence, and emerging technologies, while also integrating courses on economics, management, finance, and business communication. This blend enables students to develop both technical expertise and business acumen, equipping them to analyse real-world challenges, design technology-enabled solutions, and contribute effectively to organizational growth.

Aligned with the vision of TCS and academic institutions, the program aspires to produce graduates who demonstrate professional ethics, entrepreneurial mindset, leadership qualities, and lifelong learning orientation. With its holistic approach, the CSBS program prepares students to become globally competent professionals, capable of shaping the future of technology-driven businesses and contributing to sustainable development.

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

Program Specific Outcomes

PSO 1 – Computing Competence
Apply core concepts of computer science, programming, and emerging technologies to design and develop efficient software and system solutions.

PSO 2 – Business Integration
Integrate management, economics, and analytics knowledge with computing skills to analyze business problems and support effective decision-making.

PSO 3 – Professional & Ethical Practice
Demonstrate innovation, teamwork, communication, entrepreneurship, and ethical responsibility in developing technology-enabled business solutions.

Duration

- The B.Tech in Computer Science and Business Systems (CSBS) is a full-time undergraduate program of 4 years.
- The program is divided into 8 semesters, each consisting of coursework, laboratory sessions, projects, and industry-oriented activities.
- In addition to classroom learning, students undergo industry interaction, internships, and project-based training, facilitated by TCS and the institute..

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, examinations, assignments, and project reports is English.
- All technical and business communication, including interactions with industry mentors (TCS-supported programs), will be carried out in English to ensure global employability.
- Students are also encouraged to strengthen business communication skills and professional English throughout the program.

Abbreviations

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

Examination & Evaluation Pattern

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.

<u>Calculation of SGPA and CGPA:</u>

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)**

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

- 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 Computer Science &Business Systems

Curriculum Structure and Evaluation Scheme of Semester-I

Category	Course Code	Course Title	Teaching Scheme					Examination & Evaluation Scheme			
			L	T	P	CH	C	Component	Marks	Min for Passing	
BSC	2601UCBSBSC102	Introductory Topics in Statistics, Probability and Calculus	3	1	--	4	4	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UCBSBSC105	Physics for Computing Science	3*	--	--	3	2	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UCBSBSC105T	Physics for Computing Science Lab	--	--	2	2	1	ISA	25	10	10
ESC	2601UCBSESC101	Discrete Mathematics	3	--	--	3	3	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UCBSESC103	Fundamentals of Computer Science	3	--	--	3	3	IE	20	24	40
								MSE	20	-	
								ESE	60	16	
	2601UCBSESC103P	Fundamentals of Computer Science Lab	--	--	2	2	1	ISA	25	10	30
								POE	50	20	
	2601UCBSESC104	Principles of Electrical Engineering	3	--	--	3	3	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UCBSESC104P	Principles of Electrical Engineering Lab	--	--	2	2	1	ISA	25	10	30
								POE	50	20	
HSSM	2601UCBSHSM106	Business Communication & Value Science – I	2	--	--	2	2	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
HSSM	2601UCBSHSM106T	Business Communication & Value Science – I Lab	--	--	2	2	1	ISA	25	10	10
			17	**01**	**08**	**26**	**21**	**--**	**800**		

First Year B. Tech Computer Science &Business Systems

Curriculum Structure and Evaluation Scheme of Semester-II

Category	Course Code	Course Title	Teaching Scheme					Examination & Evaluation Scheme			
			L	T	P	CH	C	Component	Marks	Min for Passing	
BSC	2601UCBSBSC201	Linear Algebra	3	1	--	4	4	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UCBSBSC202	Statistical Methods	3	--	--	3	3	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UCBSBSC202T	Statistical Methods Lab	--	--	2	2	1	ISA	25	10	
ESC	2601UCBSESC204	Principles of Electronics Engineering	2	--	--	2	2	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UCBSESC204P	Principles of Electronics Engineering Lab	--	--	2	2	1	ISA	25	10	
								POE	50	20	
PCC	2601UCBSPCC203	Data Structures and Algorithms	3	--	--	3	3	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
	2601UCBSPCC203P	Data Structures and Algorithms Lab	--	--	2	2	1	ISA	25	10	
								POE	50	20	
CC	2601UCBSCC205	Fundamentals of Economics	2	--	--	2	2	IE	20	8	40
								MSE	20	-	
								ESE	60	24	
HSSM	2601UCBSHSSM206	Business Communication & Value Science – II	2	--	--	2	2	IE	10	5	30
								MSE	15	-	
								ESE	50	20	
	2601UCBSHSSM206T	Business Communication &Value Science II-Lab	2	--	--	2	1	ISA	25	10	
VSEC	2601UCBSVSEC207T	Web Designing	--	--	2	2	1	ISA	25	10	
			15	**01**	**10**	**26**	**21**	**--**	**800**		

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B.Tech)		
Course Code: 2601UCBSBSC102 Course Name: Introductory Topics in Statistics, Probability and Calculus		
Teaching Scheme	**Credit**	**Evaluation Scheme**
Lectures: 03 Hours/Week **Tutorial 01 Hours/Week**	**04**	**IE: 20 Marks** **MSE 20 Marks** **ESE: 60 Marks**

Prerequisites, if any:
Basic concepts of differentiation, integration, and probability.

Course Objectives: The objective of the course is to

1)	Apply differentiation for optimization, solve integration problems for area and mass.
2)	To provide students with a framework that will help them to choose the appropriate descriptive methods in various data analysis situations.
3)	To analyse distributions and relationships of real-time data.
4)	Students will apply these methods to solve real-world mathematical problems.

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

		Bloom's Level
CO1	Examine how to make the function maximum or Minimum connected with partial derivative.	Analyse
CO2	Make use of double and triple integration to find area and mass.	Apply
CO3	Understand concepts of statistics and probability.	Understand
CO4	Analyse and evaluate probability distributions.	Evaluate
CO5	Apply statistical techniques to real problems.	Apply

Course Description:
This course covers key statistical concepts, including data types, probability distributions, and sampling techniques. It focuses on measures of central tendency, dispersion, and the analysis of random variables. The students will also learn topics from calculus and apply these methods to solve complex mathematical problems.

Course Content

Unit-1	**Differential Calculus**	**6 Hours**
Introduction, Definition: -Differentiation, Rules for Differentiation, Definition: - Partial Differentiation, Partial Differentiation of first order and higher order, Partial Differentiation of some standard function and composite function, Maxima and Minima of function of two variables		
Unit-2	**Integral Calculus**	**6 Hours**
Introduction, Basic Concept of definite and Indefinite integral, Rules for integration, Double		

integral, Triple integral, Application of double integral: -Area and Mass.

Unit-3	Introduction to statistics	6 Hours

Definition, Data, various types of data, Graphical Representation of data. Measures of Location: Mean, Median, Mode and simple properties, Measures of Dispersion: Variance, Standard Deviation, Coefficient of Variation. Bivariate data, Marginal and Conditional frequency distribution.

Unit-4	Probability & Random variable	6 Hours

Definition of Probability with Properties, Random Variable and types of Random Variable, Probability Distribution, Discrete and Continuous Probability Distribution, mathematical expectation and its properties, Moment generating function and their properties.

Unit-5	Probability Distributions	6 Hours

Binomial Distribution, Poisson Distribution, Geometric Distribution, Normal Distribution, Uniform Distribution.

Unit-6	Sampling Techniques	6 Hours

Random sampling. Random Sampling from Finite and Infinite populations. Standard Error. Simple random sampling with and without replacement. Chi-square Distribution test, t – Distribution test, F-Distribution test.

Learning Resources:

Text Books

1)	Higher Engineering Mathematics - B. S. Grewal - Khanna Publication, Delhi
2)	Introduction of Probability Models– S. M. Ross - Academic Press, N.Y.
3)	Fundamentals of Statistics - I & II - A. Goon, M. Gupta and B. Dasgupta - World Press

Reference Books

1)	Applied Mathematics – 1st & 2nd edition - P. N. Wartikar and J. N. Wartikar- Vidyarthi Prakashan.
2)	A first course in Probability– S. M. Ross - Prentice Hall.
3)	Probability and Statistics for Engineers– 4th edition – I. R. Miller, J.E. Freund and R - PHI
4)	Introductions to the Theory of Statistics- A. M. Mood, F.A. Graybill ,D.C. Boes - McGraw Hill Education

e-Books

1)	***Probability and Statistical Inference*** — Hogg, Tanis & Zimmerman
2)	***Probability and Statistics for Engineering and the Sciences*** — Jay L. Devore
3)	***Probability, Statistics, and Random Processes for Engineers*** — Stark & Woods

MOOC / NPTEL/YouTube Links

1)	***NPTEL: Introduction to Probability and Statistics (class central info page)*** — likely has YouTube playlist of all lectures: https://www.classcentral.com/course/youtube-introduction-to-probability-and-statistics-47427
2)	***NPTEL Probability and Statistics (IIT Kharagpur)*** — video course playlist info: https://www.classcentral.com/course/youtube-probability-and-statistics-47803
3)	***Advanced Probability Theory (IIT Delhi)*** — NPTEL full lecture series: https://www.classcentral.com/course/youtube-advanced-probability-theory-47693
4)	***NPTEL Prep – Probability and Statistics videos list***: https://www.nptelprep.in/courses/111105041/videos

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-

Tatyasaheb Kore Institute of Engineering and Technology Second Year of Bachelor of Technology (S.Y. B.Tech)		
Course Code: 2601UCBSBSC105 Course Name: Physics for Computing Science		
Teaching Scheme	**Credit**	**Evaluation Scheme**
Lectures: 03* Hours/Week	**02**	**ISE: 20 Marks** **MSE: 20 Marks** **ESE: 60 Marks**

Prerequisites, if any:
Fundamentals of quantum mechanics, Oscillations, optics, semiconductors, nature of radiation, electromagnetism, and thermodynamics.

Course Objectives: The objective of the course is to

1)	To understand the principles of quantum mechanics.
2)	To discuss various advanced engineering materials and their properties
3)	To understand the periodic motion, oscillation and its characteristics.
4)	To discuss various properties of material for engineering applications.
5)	To familiarize with the phenomenon of light and their engineering applications.
6)	To explain various characteristics of LASER and types of Optical Fiber with applications

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

		Bloom's Level
CO1	Summarize the knowledge of basic quantum mechanics to understand Dualism and their phenomenon.	Understand
CO2	Demonstrate the different crystal structure understanding crystal physics.	Apply
CO3	Apply the theory and phenomenon oscillations to produce various motion by using oscillators	Apply
CO4	Define the fundamental concepts of Electromagnetism, Thermodynamics and Band theory for engineering applications.	Remember
CO5	Illustrate the different phenomena of light.	Understand
CO6	Explain the concepts with applications of LASER and Fiber Optics.	Understand

Course Description:
This course explores advanced topics in physics, including oscillations, interference, diffraction, and polarization. It covers lasers, fiber optics, crystallography, semiconductor physics, quantum mechanics, electromagnetism, and thermodynamics. Students will gain an understanding of both theoretical concepts and practical applications in these areas.

Course Content

Unit-1	**Quantum Mechanics:**	**6 Hours**

Introduction, Plank's quantum theory, Matter waves, de Broglie wavelength, Heisenberg uncertainty principle, time-independent and time-dependent Schrodinger's wave equation, Physical significance

of wave function, Particle in a one-dimensional potential box.		
Unit-2	**Crystallography**	**6 Hours**
Basic terms, Types of crystal systems, Bravais Lattices, Miller Indices, d spacing, Atomic packing factor for SC, BCC, FCC and HCP structures, X-ray diffraction.		
Unit-3	**Oscillation**	**6 Hours**
Periodic motion, simple harmonic motion, characteristics of simple harmonic motion, the vibration of the simple spring-mass system, Resonance - definition, damped harmonic oscillator, heavy, critical and light damping, energy decay in a damped harmonic oscillator, quality factor, forced mechanical and electrical oscillators.		
Unit-4	**Electromagnetism, Thermodynamics and Semiconductor Physics**	**7 Hours**
Electromagnetism: Continuity equation for current densities, Maxwell's equation in vacuum and non-conducting medium. **Thermodynamics**: Zeroth law of thermodynamics, First law of thermodynamics, Application of First law, Second law of thermodynamics, concept of Engine, Entropy, Change in entropy in reversible and irreversible processes. **Semiconductor**: Conductor, Semiconductor and Insulator, Origin of Band theory, Basic Concept of the Band theory.		
Unit-5	**Interference, Diffraction and Polarization of Light**	**5 Hours**
Interference: Theory of Interference fringes, types of interference, Fresnel's prism, Newton's rings, **Diffraction:** Types of diffraction, the difference between interference and diffraction, Fraunhofer diffraction at single slit plane diffraction grating, Temporal and spatial coherence. **Polarization:** Concepts of production of a polarized beam of light from two SHM acting at a right angle, plane, elliptical and circularly polarized light, Brewster's law, Double Refraction.		
Unit-6	**LASER and Fiber Optics**	**6Hours**
LASER Einstein's theory of matter radiation interaction and A and B coefficients; Amplification of light by population inversion, Different types of lasers, Ruby Laser, CO2 and Neodymium YAG (Neodymium doped Yirtium Aluminum Garnet); Properties of LASER beams (Monochromaticity, Coherence, Directionality and brightness, LASER speckles), and Applications of LASER in Engineering. **Fiber Optics** Fiber optics, Principle, Advantages, and application, types of optical fibers.		
Learning Resources:		
Text Books		

1)	Concepts Of Physics (Fifth edition) ABeiser McGraw Hill International.
2)	Fundamentals Optics (Fifth edition) AjoyGhatak, Tata McGraw Hill Sears &Zemansky University Physics, Addison –Wesley Fundamentals of Optics ,(Third Edition) Jenkins &White, McGraw-Hill.

Reference Books

1)	R. K. Gaur & Gupta S. L, Engineering Physics –DhanapatRai Publication
2)	B. L. Theraja -Modern Physics - S. Chand & Company Ltd., Delhi
3)	Subramanyam&BrijLal, A Text Book of Optics –S. Chand & Company (P.) Ltd.
4)	M. N. Avadhanulu& P. G. Kshirsagar - A Text Book of Engineering Physics -S. ChandPublication. B. K. Pandey and S. Chaturvedi- Engineering Physics, Cengage Learning.
5)	R. K. Gaur & Gupta S. L, Engineering Physics –DhanapatRai Publication

e-Books

1)	http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
2)	https://en.wikipedia.org/wiki/Fundamentals_of_ Physics

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://nptel.ac.in/courses/115/105/115105083/
6)	https://nptel.ac.in/courses/115/102/115102124/

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-
CO6	3	2	-	-	-	-	-	-	-	-	-

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

Course Code:2601UCBSBSC105T Course Name: Physics for Computing Science-Lab

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

Prerequisites, if any:
Prior knowledge of measurement instruments, calculator operations, drawing of graphs and their calculations.

Course Objectives: The objective of the course is to

1) To introduce fundamental concepts of oscillations, wave phenomena, and quantum mechanics.
2) To provide an understanding of semiconductor physics, electromagnetism, and thermodynamics with engineering applications.

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

CO1	Understand basic principles of oscillations, interference, and diffraction, and their applications.
CO2	Apply concepts of lasers, fiber optics, and crystallography in practical and engineering contexts.
CO3	Analyze quantum mechanics, electromagnetism, and thermodynamics to solve real-world physics problems.

Course Description:
The aim of this course is to make the students gain practical knowledge to co-relate with the theoretical studies and to use the principle in the right way to implement the modern technology.
The experiments are selected from various areas of Physics like Measurements, Wave Optics, Lasers, Solid state physics and Basic Electronics. Physics for Computing science Laboratory manual is written in a simple scientific language with aim, apparatus, theory, diagrams, formula, graph 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	Measurement in Physics	**2**
2	Resistor and Capacitor Codes	**2**
3	Determination of Wave length of LASER light by diffraction method.	**2**
4	Determination of laser and optical fiber parameters.	**2**
5	Magnetic field along the axis of current carrying coil.	**2**
6	Determination of Hall coefficient of semiconductor.	**2**

7	Determination of Planks Constant by using LED.	**2**
8	Determination of wavelength of light by Newton's Ring method.	**2**
9	Determination of Stefan's Constant.	**2**
10	Study of the Seven Crystal System	**2**
11	Miller Indices	**2**
12	Measurement of Band Gap Energy	**2**

Learning Resources:

Text Books

1. Physics Lab Manual, TKIET Warananagar
2. 2.Madhusudhan Rao, Engineering Physics Lab Manual, Scitech Publication
3. 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) https://www.prit.ac.in/virtual-labs
2) http://vlabs.iitkgp.ernet.in/be/index.html#
3) https://www.youtube.com/watch?v=NAjd1knWDSA
4) https://www.youtube.com/watch?v=gPnhtRs-0Os
5) http://emv-au.vlabs.ac.in/electricity-magnetism/Circular_Coil/experiment.html
6) https://mpv-au.vlabs.ac.in/modern-physics/Hall_Effect_Experiment/
7) https://mpv-au.vlabs.ac.in/modern-physics/Determination_of_Plancks_Constant/
8) https://lo-au.vlabs.ac.in/laser-optics/Newtons_Rings_Wavelength_of_light/
9) https://bop-iitk.vlabs.ac.in/exp/stefans-law/
10) http://vlab.amrita.edu/?sub=1&brch=282&sim=370&cnt=1
11) https://bop-iitk.vlabs.ac.in/exp/energy-band-gap/simulation.html

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B.Tech)		
Course Code: 2601UCBSESC101 Course Name: Discrete Mathematics		
Teaching Scheme	**Credit**	**Evaluation Scheme**
Lectures: 03 Hours/Week	**03**	**IE: 20 Marks** **MSE: 20 Marks** **ESE: 60 Marks**

Prerequisites, if any:
Basic knowledge of algebra and introductory mathematics is required.

Course Objectives: The objective of the course is to

1)	To build a strong mathematical foundation for advanced Computer Science studies.
2)	To cover discrete mathematics, including discrete objects and countable sets.
3)	To develop logical thinking and reasoning skills for computer science.
4)	To apply discrete math concepts to real-world computing problems.
5)	To enhance problem-solving abilities through mathematical reasoning.

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

		Bloom's Level
CO1	Explain the principles of Boolean algebra and its significance in digital logic design.	Understand
CO2	Describe mathematical logic, truth tables, and their applications to programming and hardware design.	Understand
CO3	Apply concepts from abstract algebra to analyze and demonstrate the properties of algebraic structures.	Apply
CO4	Analyze existing concepts and techniques in graph theory and trees to solve network problems.	Analyse
CO5	Examine different counting principles to determine and solve various combinatorial configurations.	Understand

Course Description:
This course explores discrete mathematics, including logic, combinatorics, graph theory, and algebra. It develops skills in logical reasoning, problem-solving, and mathematical proofs. Students will apply these concepts to real-world computing challenges.

Course Content

Unit-1	**Boolean Algebra**	**06 Hours**

Introduction to Boolean algebra, truth tables, basic logic gates, basic postulates of Boolean algebra, principle of duality, canonical forms, Karnaugh maps.

Unit-2	**Mathematical Logic**	**08 Hours**

Propositional calculus — propositions and connectives, syntax.
Semantics — truth assignments and truth tables, validity and satisfiability, tautology.
Adequate set of connectives, equivalence and normal forms.
Compactness and resolution.
Formal reducibility — natural deduction system and axiom system.

Soundness and completeness.		
Unit-3	**Abstract Algebra**	**04 Hours**
Sets, relations, groups, semigroups, monoids, subgroups, Abelian groups, cyclic groups, rings, integral domains, and fields.		
Unit-4	**Graph Theory**	**06 Hours**
Graphs and digraphs, complements, isomorphism, adjacency matrix. Connectedness and reachability. Eulerian paths and circuits in graphs and digraphs. Hamiltonian paths and circuits in graphs and tournaments.		
Unit-5	**Trees**	**06 Hours**
Trees, planar graphs, Euler's formula, dual of a planar graph, independence number and clique number, chromatic number, graph colouring, rooted trees, prefix codes, and Huffman coding method.		
Unit-6	**Combinatorics**	**06 Hours**
Introduction to basic counting principles, formulas for nPr and nCr, balls and bins problems, pigeonhole principle, recurrence relations, generating functions, and introduction to proof techniques — mathematical induction.		

Learning Resources:

Text Books

1)	**Discrete Mathematics and Its Applications** — Kenneth H. Rosen,KhannaPublishers.
2)	**Modern Algebra** — A. R. Vashistha, Krishna Prakashan
3)	**Applied Combinatorics** — Alan Tucker, Wiley
4)	**A Textbook on Discrete Mathematics** — C. V. Sastry, Rakesh Nai, Wiley

Reference Books

1)	**Introduction to Linear Algebra** — Gilbert Strang
2)	**Introductory Combinatorics** — R. A. Brualdi, North-Holland, New York
3)	**Graph Theory with Applications to Engineering and Computer Science** — N. Deo, Prentice Hall, Englewood Cliffs
4)	**Introduction to Mathematical Logic (Second Edition)** — E. Mendelsohn, Van Nostrand, London

e-Books

1)	Discrete Mathematics — Kenneth Rosen (Lecture Notes & Resources) https://www.cs.bham.ac.uk/~mdr/teaching/modules04/java2/Rosen.pdf
2)	Discrete Mathematics — MIT OpenCourseWare (Notes + Readings) https://ocw.mit.edu/courses/6-042j-mathematics-for-computer-science-spring-2015/

MOOC / NPTEL/YouTube Links

1)	https://nptel.ac.in/courses/106106094
2)	https://nptel.ac.in/courses/106102184
3)	https://nptel.ac.in/courses/106101090
4)	https://nptel.ac.in/courses/111106086

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	-	-	-	-	-	-	-	-	-
CO2	3	3	-	-	-	-	-	-	-	-	-
CO3	3	3	-	-	-	-	-	-	-	-	-
CO4	3	3	-	-	-	-	-	-	-	-	-
CO5	3	3	-	-	-	-	-	-	-	-	-

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B.Tech)		
Course Code: 2601UCBSESC103 Course Name: Fundamentals of Computer Science		
Teaching Scheme	**Credit**	**Evaluation Scheme**
Lectures: 03 Hours/Week	**03**	**IE: 20 Marks**
		MSE: 20 Marks **ESE: 60 Marks**

Prerequisites, if any:

1. Basic knowledge of algorithm
2. Basic knowledge of mathematical formula (arithmetical and logical)
3. Basic knowledge of logical thinking

Course Objectives: The objective of the course is to

1) To understand fundamental Programming Concepts And Structures.
2) To devlop Skills in Writing and Managing Functions And Data Structures.
3) To apply programming techniques to solve real-world problems and work with system interface.

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

CO1	**Identify** and use Fundamental Programming Concepts And Data Types
CO2	**Apply** Control Flow Statements like loops And Conditional in Programs.
CO3	**Understand** the use and Management of functions,including recursion and scope.
CO4	**Utilize** pointers and arrays for efficient data handling and memory Management.
CO5	**Apply** File I/O Operations And interact with Unix System Interface.

Course Description:

Fundamentals Of Computer Science course is offered as the basic science course. This course contains Programming methods and techniques that are typically used in engineering to solve complex engineering problems. This course has six units namely i) General Problem-Solving Concepts And Imperative Languages ii) Control Flow With Discussion on Structured And Unstructured Programming, iii)Functions And Program Structure with Discussion On Standard Library, iv) Pointers And Arrays, v) Structures, vi)Unix System Interface.

Course Content

Unit-1	**General Problem-Solving Concepts And Imperative Languages**	**7 Hours**

Algorithms,and flowchart for problem solving with sequential logic structure, Decisions and Loops. Imperative Languages: Introduction to Imperative Languages; Syntax And Constructs of specific Language(ANSI C). Types Of operators And Expression With Discussion With Variable Naming and Hungarian Notation: variable names ,data types and sizes (little endian Big endian), Constants, Declarations, Airthmetic Operators, Reletional Operatoes,logical operators,type conversion,Increment Decrement Operators ,Bitwise operators , Assignment Operators , Assignment operators and expressions, precedence and order of evaluation , proper variable naming and Hungarian notations.

Unit-2	**Control Flow With Discussion on Structured And Unstructured Programming**	**6 Hours**
Statements And Blocks, If-else-if, switch, loops- While, do, for, break and continue, Goto Lables, Structured Adb un-Structured Programming.		
Unit-3	**Functions And Program Structure with Discussion On Standard Library**	**6 Hours**
Basics of Functions, Parameter Passing and Returning Type, C main Return As Integer, External, Auto, Local, Static, Register Variables, Scope Rules, Block Structure, Initialization, Recursion, Pre-Processor, Standars Library Functions and Return Types.		
Unit-4	**Pointers And Arrays**	**6 Hours**
Pointer and address, pointer and Functions arguments, Pointer and Arrays, Address Arithmetic, character pointers and functions, pointer arrays, pointer to pointer, multidimensional array and row/column major formats, initialization of pointer arrays, command line arguments, pointer to functions, complicated declarations and how they are evaluated.		
Unit-5	**Structures**	**6 Hours**
Bacic Structures : Structures and Functions, Array Of Structures, Pointer Of Structures, Self-referal Structures, Table Look up, Typedef, Union , Bit-fields **Input And Output** : Standard I/O, formatted input- scanf , variable length argument list, file Access including FILE Structure, fopen, stdin, stdout and stderr, Error Handling including exit, perror and error.h, Line I/O, releted miscellaneous functions.		
Unit-6	**Unix System Interface**	**6 Hours**
Flie Desriptor , low level i/o –read and write, open, create, close and unlink, Random accsee- lessk, Discussion on Listing Directory, Storage allocator Programming Method: Debugging, Macros, User Defined Header , User Defined Library Function, make file utility.		
Learning Resources:		
Text Books 1) B .W .Kernighan and D. M. Ritchi , " The C Programming Language" , Second Edition ,PHI. 2) B. Gottfried, "Programming in C", second edition, schaum outline series.		
Reference Books • Herbert Schildt,"C:The Complete Referance", Fourth Edition, McGraw Hill • Yashwant Kanitkar, ""Let us C" ,BPB Publication		
MOOC / NPTEL/YouTube Links 1) https://nptel.ac.in/courses/106104128 2) Introduction To Programming In C - Course (nptel.ac.in)		

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

Course Code: 2501UCBSESC103P Course Name: Fundamentals of Computer Science Lab

Teaching Scheme	Credit	Evaluation Scheme
Practical: 02 Hours/Week	01	ISA: 25 Marks POE: 50 Marks

Prerequisites, if any:

4. Basic knowledge of algorithm
5. Basic knowledge of mathematical formula (arithmetical and logical)
6. Basic knowledge of logical thinking

Course Objectives: The objective of the course is to

1. To Devlop Proficiency in fundamental C Programming Constructs And Techniques.
2. To Implement robust input validiation and error handling in C Programs.
3. To enhance Problem-solving Skills through Practical programming Challenges.

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

CO1	To apply Varous C Programming Constructs to Write and Debug programs That effectively solve Specified Problems..
CO2	To analyze and manipulate data through string and file handling.
CO3	To createmodular and error resistant C Programs using User-defined Libraries, showcasing their ability to design and implement complex solutions.

Course Description:

Fundamentals Of Computer Science course is offered as the basic science course. This course contains Programming methods and techniques that are typically used in engineering to solve complex engineering problems. This course has six units namely i) General Problem-Solving Concepts and Imperative Languages ii) Control Flow with Discussion on Structured and Unstructured Programming, iii) Functions and Program Structure with Discussion on Standard Library, iv) Pointers and Arrays, v) Structures, vi) Unix System Interface.

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Assigned Hours
1	Write a C program to display a specified pattern using nested loops.	2
2	Create a C Program that Prints Its Own Source Code as output.	2
3	Devlope C Program That Demonstrate the use of arrays with both simple recursive function.	2
4	Implement A C program to count the number of lines,words and characters in a given text file.	2
5	Write a C program that utilize Structures and Pointers to	2

	manage and manipulate complex data.	
6	Create a Multi-file C Program that employs user-defined libraries to enhance code organisation.	**2**
7	Devlop a C program that Accepts Single Alphabetical Characters, sorting them and terminating ona non-alphabetical input.	**2**
8	Write a C Program that checks another c program for common syntax errors, including unbalanced paranthesis and quotes.	**2**
9	Implement C Program that Performs Prime Factorisation Of an Integer from command-line input, outputting results of both the console and text file.	**2**
10	Create a c Program that functions as abasic calculator, using functions to perform arithmetic operations based on user input.	**2**

Learning Resources:

Text Books

3) B .W .Kernighan and D. M. Ritchi , " The C Programming Language" , Second Edition ,PHI
4) B. Gottfried, "Programming in C", second edition, schaum outline series

Reference Books

- Herbert Schildt,"C:The Complete Referance", Fourth Edition, McGraw Hill
- Yashwant Kanitkar, ""Let us C" ,BPB Publication

MOOC / NPTEL/YouTube Links

3) https://nptel.ac.in/courses/106104128
4) Introduction To Programming In C - Course (nptel.ac.in)

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B.Tech)		
Course Code: 2601UCBSHSM106 Course Name: Business Communication Value-I		
Teaching Scheme	**Credit**	**Evaluation Scheme**
Lectures: 02 Hours/Week	**02**	**ISE: 20 Marks** **MSE: 20 Marks** **ESE: 60 Marks**

Prerequisites, if any: Basic English HSC level

Course Objectives: The objective of the course is to

1)	To develop communication skills and overcome barriers
2)	To enhance verbal aptitude and grammar
3)	To improve listening, speaking, and business correspondence

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

		Bloom's Level
CO1	Recognize the importance of life skills and values in personal and professional growth	
CO2	Identify personal strengths and areas for improvement to foster self-development	
CO3	Apply life skills effectively in various real-world situations	
CO4	Understand and implement key communication practices across different types of interactions	

Course Description: This course help students develop life skills for a balanced life, encourage self-improvement, and introduce key concepts like values and business communication. Enhancing their English grammar and communication skills will boost their performance in assessments and professional interactions.

Course Content

Unit-1	**Communication and Values**	**05 Hours**

Introduction to Values: Understanding their importance and necessity. Communication Fundamentals: Exploring the significance, process, and levels of communication. Methods of Communication: Distinguishing between verbal and non-verbal forms. Communication Barriers: Identifying obstacles and discovering solutions.

Unit-2	**Communication in Business Context**	**04 Hours**

Overview of Business Communication: Flow/channels of business communication (Internal, External, Vertical, Horizontal, Diagonal, Grapevine), Problems and Solutions

Unit-3	**Verbal Aptitude**	**5 Hours**

Grammar: parts of speech-using articles, conjunctions and prepositions; using appropriate tenses, degree, voice Vocabulary: Affixation, synonyms and antonyms, idioms, confusable-homophones and homonyms. Syntax: types of sentences, spotting errors in sentences with justification

Unit-4	**Enhancing Listening, Speaking, and Thinking Skills**	**5 Hours**

Effective listening: Law of nature- Importance of listening skills, Difference between listening and hearing, process and advantages of listening, poor listening habits, types of listening, strategies for effective listening, listening barriers Effective speaking: Importance, various oral business contexts/situations, preparing effective public speeches, expressing oneself clearly •Thinking as a learning skill.

Unit-5	**Formal Business Correspondence-1**	**3 Hours**

Principles, structure (elements) Layout (complete block, modified block, semi- block)

Unit-6	**Formal Business Correspondence-2**	**5 Hours**

Types of letters (leave application, enquiry and replies, claim and adjustment

Learning Resources:

Text Books

1)	Communication Skills– 3rd edition - Meenakshi Raman and Sangeeta Sharma – Oxford University Press (OUP)
2)	Communication Skills – 2nd edition - Sanjay Kumar and PushpaLata- Oxford University Press (OUP)_

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, 200
10)	Essential English Grammar (Elementary & Intermediate) Raymond Murphy Cambridge University Press (CUP)
11)	English Language Laboratories, NiraKonar, 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*

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B.Tech)		
Course Code: 2601UCBSESC104 Course Name: Principles of Electrical Engineering		
Teaching Scheme	**Credit**	**Evaluation Scheme**
Lectures: 03 Hours/Week	**03**	**IE: 20 Marks** **MSE 20 Marks** **ESE: 60 Marks**

Prerequisites, if any:
Basic knowledge of current, resistance, series parallel, magnetic circuit.

Course Objectives: The objective of the course is to

1)	To understand fundamental electrical concepts and circuit analysis techniques.
2)	To apply principles of electrostatics, capacitors, and batteries in practical scenarios.
3)	To analyze AC circuits and electromechanical systems, including sensors and measurement techniques.
4)	

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

		Bloom's Level
CO1	Apply knowledge of basic concepts of work, power, energy for energy conversion and calculate current in electrical network using Kirchhoff's laws.	Apply
CO2	Calculate response of electrical circuit using network theorems	Calculate
CO3	Define basic terms of single phase and three phase ac circuits and supply systems.	Describe
CO4	Describe construction, principle of operation, specifications and applications of capacitors and batteries	Describe
CO5	Apply fundamental concepts of magnetic and electro-mechanics for operation of single-phase transformer, illumination and describe types of wiring and earthling system.	Apply

Course Description:
This course covers fundamental concepts in electrical engineering, including DC and AC circuits, electrostatics, capacitors, and batteries. It explores the principles of electro mechanics, sensors, and measurement systems. Students will gain practical knowledge of electrical networks, power analysis, and wiring systems.

Course Content

Unit-1	**Introduction:**	**5 Hours**

Concept of EMF, Potential difference, voltage, current, resistance, voltage source and current sources, ideal and practical sources, concept of dependent and independent sources, Kirchhoff-s laws and applications to network solutions using mesh and nodal analysis (Numerical Treatment:

KCL, KVL-Two Loops)		
Unit-2	**DC Circuits:**	**5 Hours**
Ohm Law, Difference between AC and DC Circuit, Thevenin's theorem, Norton's Theorem, Simplifications of networks using series-parallel, Star/Delta transformation. (Numerical Treatment: Simplifications of networks using series-parallel, Star/Delta transformation))		
Unit-3	**AC Circuits**	**5 Hours**
Faradays law, AC waveform definitions, form factor, peak factor, study of R-L, R-C, RLC series circuit, concept of impedance, admittance, active, reactive, apparent power, definition of power factor, Three-phase balanced AC circuits (Y-Δ and Δ-Y): (Numerical Treatment: RL, RC, RLC Series)		
Unit-4	**Electrostatics**	**5 Hours**
Electrostatic field, electric field strength, concept of permittivity in dielectrics, capacitors in series and parallel, energy stored in capacitors, Principle of batteries, types, construction and working, application. (Numerical Treatment: capacitors in series and parallel).		
Unit-5	**Electro-Mechanics**	**5 Hours**
Self and mutual inductance, Ampere's law, Comparison between magnetic and electric circuits and B-H Curve, Single phase transformer, principle of operation, EMF equation, KVA rating, losses in transformer, efficiency and regulation. (Numerical Treatment: Single phase transformer)		
Unit-6	**Measurements and Sensors**	**5 Hours**
Measuring devices/sensors: Piezoelectric and thermo-couple related to electrical signals, Basic concept of indicating and integrating instruments, Electrical Wiring Different types of lamps like Fluorescent Lamp, Compact Fluorescent Lamp, Sodium Vapour Lamp, Mercury Vapour Lamp., Necessity of earthing, Types of earthing.		

Learning Resources:

Text Books

1)	Electric Machinery (Sixth Edition) A.E. Fitzgerald, KingselyJr Charles, D. Umans Stephen, Tata McGraw Hill.
2)	A Textbook of Electrical Technology, (vol. I), B. L. Theraja, Chand and Company Ltd. Delhi.
3)	Basic Electrical Engineering, V. K. Mehta, S. Chand and Company Ltd., New Delhi.
4)	Theory and problems of Basic Electrical Engineering, (Second Edition), J. Nagrath and Kothari, Prentice Hall of India Pvt. Ltd.
5)	

Reference Books

1)	Basic of Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford University Press. T. K. Nagsarkar and M. S. Sukhija, Basic of Electrical Engineering, Oxford University Press, 2011
2)	Introduction to Electrodynamics, D. J. Griffiths, (Fourth Edition), Cambridge University

	Press.
3)	Engineering Circuit Analysis, William H. Hayt& Jack E. Kemmerly, McGraw-Hill Book
4)	Fundamentals of Electrical and Electronics Engineering, Smarjith Ghosh, Prentice Hall (India) Pvt. Ltd.

e-Books

1)	https://nirmt.com/page/electrical-engineering-e-book
2)	https://books.google.co.in/books/about/Principles_of_Electrical_Engineering_and.html?id=JTny7w2ojwwC&redir_esc=y
3)	https://www.pcefet.com/common/library/books/39/173_BasicElectricalEngineeringbyV.K.MehtaandRohitMehta.pdf
4)	https://www.opentextbooks.org.hk/system/files/export/9/9648/pdf/Fundamentals_of_Electrical_Engineering_I_9648.pdf
5)	https://www.allaboutcircuits.com/textbook/

MOOC / NPTEL/YouTube Links

1)	https://onlinecourses.nptel.ac.in/noc20_ee68/preview
2)	https://www.youtube.com/user/nptelhrd
3)	https://www.youtube.com/watch?v=8AfdmidxbNI
4)	https://www.youtube.com/watch?v=VXo0p_1z3Uw
5)	https://www.youtube.com/watch?v=Fljk_j6VUHE

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2		-		-	-	-	-	-	-	-
CO2	3	3	-	2	-	-	-	-	-	-	-
CO3	2	-	1	1	2	-	-	-	-	-	-
CO4	1	-	-	-	-	-	-	-	-	-	-
CO5	2	-	2	2	2	-	-	-	-	-	-

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

Course Code: 2601UCBSESC104P Course Name: Principles of Electrical Engineering Lab

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

Prerequisites, if any:
Basic knowledge of current, resistance, series parallel, magnetic circuit

Course Objectives: The objective of the course is to

1)	To impart the use of electrical Elements, sources, measuring devices and transducers relatedto electrical circuits experimentally.
2)	To verify the network theorems for the electric circuit using hardware.
3)	To enable experimental measurement of electrical quantities in DC and AC systems
4)	

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

CO1	Understand the principles of electrical circuits and measurement techniques.
CO2	Apply theoretical concepts to validate DC circuit theorems through experiments.
CO3	Analyze circuit performance and behavior in RL, RC, and AC circuits using practical measurements.

Course Description:
This course covers fundamental concepts in electrical engineering, including DC and AC circuits, electrostatics, capacitors, and batteries. It explores the principles of electro mechanics and measurement systems. Students will gain practical knowledge of electrical networks, power analysis, and wiring systems.

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Assigned Hours
1	Familiarization of electrical Elements, sources, measuring devices and transducers related to electrical.	2
2	Verification of Ohm's Law.	2
3	Verification of KCL and KVL	2
4	Verification of Thevenin's Theorem	2
5	Verification of Maximum Power Transfer Theorem.	2
6	Study of R-L, R-C, and R-L-C Series Circuits	2
7	Series-Parallel and Star-Delta Transformation	2
8	Measurement of Power and Power Factor in AC Circuit	2

9	Capacitors in Series and Parallel	**2**
10	Study of Single Phase Transformer	**2**

Learning Resources:

Text Books

1)	Electric Machinery (Sixth Edition) A.E. Fitzgerald, KingselyJr Charles, D. Umans Stephen, Tata McGraw Hill.
2)	A Textbook of Electrical Technology, (vol. I),B. L. Theraja, Chand and Company Ltd. Delhi.
3)	Basic Electrical Engineering, V. K. Mehta, S. Chand and Company Ltd., New Delhi.
4)	Theory and problems of Basic Electrical Engineering, (Second Edition), J. Nagrath and Kothari, Prentice Hall of India Pvt. Ltd.
5)	

Reference Books

1)	Basic of Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford University Press. T. K. Nagsarkar and M. S. Sukhija, Basic of Electrical Engineering, Oxford University Press, 2011
2)	Introduction to Electrodynamics, D. J. Griffiths, (Fourth Edition), Cambridge University Press.
3)	Engineering Circuit Analysis, William H. Hayt& Jack E. Kemmerly, McGraw-Hill Book
4)	Fundamentals of Electrical and Electronics Engineering, Smarjith Ghosh, Prentice Hall (India) Pvt. Ltd.

e-Books

1)	https://nirmt.com/page/electrical-engineering-e-book
2)	https://www.allaboutcircuits.com/textbook/
3)	https://books.google.co.in/books/about/Principles_of_Electrical_Engineering_and.html?id=JTny7w2ojwwC&redir_esc=y
4)	https://www.opentextbooks.org.hk/system/files/export/9/9648/pdf/Fundamentals_of_Electrical_Engineering_I_9648.pdf
5)	https://www.allaboutcircuits.com/textbook/

MOOC / NPTEL/YouTube Links

1)	https://onlinecourses.nptel.ac.in/noc20_ee68/preview
2)	https://www.youtube.com/user/nptelhrd
3)	https://www.youtube.com/watch?v=8AfdmidxbNI
4)	https://www.youtube.com/watch?v=VXo0p_1z3Uw

5)	https://www.youtube.com/watch?v=Fljk_j6VUHE
6)	https://onlinecourses.nptel.ac.in/noc20_ee68/preview

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO1
CO1	3	2	1	-	-	-	-	-	-	-	-
CO2	3	3	1	1	-	-	-	-	-	-	-
CO3	3	2	-	1	-	-	-	-	-	-	-

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

Course Code:2601UCBSHSM106T Course Name: Business Communication and Value Science-I LAB

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

Prerequisites, if any: Basic Knowledge of English Grammar

Course Objectives: The objective of the course is to

1)	To Enhance students' understanding of English sounds for improved pronunciation
2)	To Develop students' listening and speaking skills through practical exercises
3)	To Strengthen grammatical competence to enable effective communication

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

CO1	Analyse English sounds and grammar to improve professional communication.
CO2	Apply effective listening techniques in everyday interactions.
CO3	Construct and deliver impactful public speeches.

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	Assigned Hours
1	**Ice Breaking**: Introduce yourself and others using adjectives and phrases for effective communication.	**02**
2	**Life Skills Presentation**: Present one favourite sports captain, focusing on the skills and values they demonstrate.	**02**
3	**Phonetics Practice**: Explore consonants, vowels, and diphthongs in English, practicing pronunciation with audio-visual aids.	**02**
4	**Verbal Aptitude-Vocabulary**: Engage in vocabulary-building games and practice using idioms and homonyms.	**02**
5	**Verbal Aptitude-Grammar**: Practice grammar skills, including tense usage, articles, and error spotting in sentences.	**02**
6	**Listening Comprehension**: Develop effective listening strategies through guided audio and video exercises.	**02**
7	**Speaking Practice-Public Speaking**: Analyse effective speeches and practice extemporaneous and prepared speaking.	**02**
8	**SpeakingPractice-PreparedSpeeches**:Deliverpreparedspeechesforassessmentand improvement feedback.	**02**
9	**Experiencing Life Skills**: Participate in community service with an	**02**

	NGO and share your experience through role-play.	
10	**Understanding Life Skills:** Analyse "The Pursuit of Happiness" to identify and relate to essential life skills and values	**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, 200
10)	Essential English Grammar (Elementary & Intermediate) Raymond Murphy Cambridge University Press (CUP)
11)	English Language Laboratories, NiraKonar, 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/BCADES201slm.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*

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-
CO6	3	2	-	-	-	-	-	-	-	-	-

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B. Tech)		
Course Code: 2601UCBSBSC201 Course Name: LINEAR ALGEBRA		
Teaching Scheme	**Credit**	**Evaluation Scheme**
Lectures: 03 Hours/Week **Tutorials: 01 Hours/Week**	**04**	**IE: 20 Marks** **MSE: 20 Marks** **ESE: 60 Marks**

Prerequisites, if any:
Basic terminologies of vector space, Basic knowledge of Matrix, Linear Equations, and modern algebra.

Course Objectives: The objective of the course is to

1)	To make the students equipped with the **fundamental concepts** and techniques of linear algebra.
2)	To develop the skill in students to do programming using linear algebra techniques.
3)	**To utilize advanced techniques such as quadratic forms s**ingular value decomposition, and principal component analysis in practical applications.
4)	To develop the skills in students to understand the mathematical background in engineering problems.

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

		Bloom's Level
CO1	**Explain systems of linear equations and perform matrix decomposition techniques.**	Understand
CO2	Apply the concept of vector spaces and linear transformations to engineering problems.	Apply
CO3	**Understand eigenvalues and eigenvectors and apply diagonalization methods.**	Understand
CO4	Apply the concepts quadratic forms, SVD and PCA **for applications in image processing and machine learning.**	Apply
CO5	Apply inner product space and Gram Schmidt orthonormalization decomposition concepts in programming.	Apply

Course Description:
This course contains study of system of linear equations, Eigen values and Eigen vectors, Vector Spaces, Linear Transformation, Quadratic forms & Inner product spaces.

Course Content

Unit-1	**System of Linear Equations**	**6 Hours**
Rank of a Matrix, System of Linear Equations, Gauss Elimination, LU Decomposition method.		
Unit-2	**Vector Space**	**6 Hours**
Vectors, n-Vectors, linear combination, Linear Dependence & Independence of vectors, Vector space, Subspace, Spanning Set, Basis & Dimension.		

Unit-3	Linear Transformations	6 Hours
Linear Transformations, Matrix of Linear transformation, Range and Kernel, Non-singular linear transformation, Rank-Nullity Theorem, Orthogonal transformation.		
Unit-4	**Eigen Values and Eigen Vectors**	**6 Hours**
Eigen Values and Eigen Vectors, Cayley Hamilton theorem and its Applications, Diagonalization, Inverse and power of matrix by modal matrix.		
Unit-5	**Quadratic Forms and Applications**	**6 Hours**
Quadratic forms, Symmetric Matrices, Reduction of Quadratic forms to canonical form, Definite &Semi- definite forms, Linear and Orthogonal transformation, Singular value decomposition (SVD) and Principal Component Analysis (PCA), Applications to Image Processing and Machine Learning.		
Unit-6	**Inner Product Space**	**6 Hours**
Inner Product Space, Norm of a Vector, Orthogonality, Orthogonal Projection, Gram-Schmidt Ortho normalization, QR decomposition.		

Learning Resources:

Text Books

1)	Higher Engineering Mathematics - B. S. Grewal - Khanna Publication, Delhi
2)	Elementary Linear Algebra–Larson, Edwards, Falvo-Houghton Mifflin.
3)	Introduction to linear algebra–Gilbert Strang -Wellesley.
4)	Linear Algebra–Kenneth Hoffman, Ray Kunze-Pearson.

Reference Books

1)	Linear Algebra – Seymour and – McGraw Hill.
2)	Linear Algebra and its Applications – David C Lay and – Pearson.
3)	Linear Algebra – Kenneth M Hoffman and – Prentice Hall.

e-Books

1)	Halmos, P. R. Finite Dimensional Vector Spaces.
2)	UC Davis Linear Algebra

MOOC / NPTEL/YouTube Links

1)	https://youtu.be/ICCAPfLkaHE?si=B5fD_o5ly6sDRzH4
2)	https://onlinecourses.nptel.ac.in/noc26_ma13/preview

3)	https://nptel.ac.in/courses/111108414

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B.Tech)		
Course Code: 2601UCBSBC202 Course Name: Statistical Methods		
Teaching Scheme	**Credit**	**Evaluation Scheme**
Lectures: 03 Hours/Week	**03**	**IE: 20 Marks** **MSE: 20 Marks** **ESE: 60 Marks**

Prerequisites, if any:

Basic statistics and Probability.

Course Objectives: The objective of the course is to

1)	To explain the role of regression and data analysis in business decision-making.
2)	To impart knowledge on data collection, analysis, and presentation for informed decisions.
3)	To apply estimation, testing, and modeling techniques to analyze real-time data and relationships.

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

		Bloom's Level
CO1	**Explain** concepts of correlation, regression, and linear statistical models	Understand
CO2	**Apply** methods of data collection, presentation, and descriptive statistics for data analysis.	Apply
CO3	**Apply** estimation techniques, including point estimation and maximum likelihood estimation, for statistical inference.	Apply
CO4	**Analyze** hypothesis testing methods (large and small sample tests, t-test, Chi-square, F-test) to draw valid conclusions.	Analyse
CO5	**Analyze and evaluate** variance analysis (ANOVA) and non-parametric tests for decision-making.	Evaluate
CO6	Apply time series models (ARIMA) for forecasting and interpreting real-world data trends.	Apply

Course Description:

In this course, students will learn Regression, Statistical Inference, and **Time Series Analysis** to model relationships, make predictions, and analyze time-based data. These skills will help them apply statistical Techniques for data-driven decision-making

Course Content

Unit-1	**Linear Statistical Models**	**06 Hours**
Correlation and scatter diagram, linear regression and least squares method, multiple regression and multiple correlation, rank correlation.		
Unit-2	**Statistical Inference – I (Estimation)**	**07 Hours**
Point estimation, criteria for good estimates (unbiasedness, consistency, and sufficiency), methods of estimation including maximum likelihood estimation.		
Unit-3	**Statistical Inference – II (Test of Significance)**	**08 Hours**
Test of hypothesis, sampling distribution of mean and standard error, large sample tests: test for an assumed mean and equality of two population means.		

Small sample tests: t-test for an assumed mean and equality of means of two populations, paired t-test, Neyman-Pearson lemma		
Unit-4	**Analysis of Variance**	**08 Hours**
Test for single variance using Chi-square distribution, test for two variances using F-distribution, analysis of variance (one-way and two-way with and without interaction).		
Unit-5	**Non-parametric Inference**	**07 Hours**
Comparison with parametric inference, use of order statistics, sign test, Wilcoxon signed-rank test, Mann-Whitney test, run test, Kolmogorov-Smirnov test, Spearman's and Kendall's test, tolerance region.		
Unit-6	**Basics of Time Series Analysis & Forecasting**	**04 Hours**
Stationary ARIMA models: identification, estimation, and forecasting.		

Learning Resources:

Text Books

1)	**Probability and Statistics for Engineers (4th Edition)** — I. R. Miller, J. E. Freund, and R. Johnson
2)	**Fundamentals of Statistics (Vol. I & II)** — Goon, M. Gupta, World Press
3)	**The Analysis of Time Series: An Introduction** — Chris Chatfield

Reference Books

1)	**Introduction to Linear Regression Analysis** — D. C. Montgomery & E. Peck
2)	**Introduction to the Theory of Statistics** — A. M. Mood, F. A. Graybill & D. C. Boes
3)	**Applied Regression Analysis** — N. Draper & H. Smith
4)	**Hands-on Programming with R** — Garrett Grolemund
5)	**R for Everyone: Advanced Analytics and Graphics** — Jared P. Lander

e-Books

1)	Deep R Programming (Free PDF + Online Book)
2)	**Introduction to Randomness and Statistics (Free PDF – arXiv)** Covers probability, estimators, hypothesis testing, confidence intervals, and data analysis. https://arxiv.org/abs/0910.4545

MOOC / NPTEL/YouTube Links

1)	**Introduction to Probability and Statistics — IIT Madras (NPTEL)** Course lectures, assignments, and syllabus. https://archive.nptel.ac.in/courses/111/106/111106112/
2)	**Introduction to Probability Theory and Statistics — IIT Delhi (NPTEL)** https://onlinecourses.nptel.ac.in/noc22_ma81/preview
3)	**NPTEL — Introduction to Probability & Statistics (IIT Madras)** https://www.youtube.com/watch?v=gIsrNZv-AhU

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	-	-	-	-	-	-	-	-	-
CO2	3	3	-	-	-	-	-	-	-	-	-
CO3	3	3	-	2	-	-	-	-	-	-	-
CO4	3	3	-	-	-	-	-	-	-	-	-
CO5	3	3	-	2	-	-	-	-	-	-	-

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B.Tech)		
Course Code: 2601UCBSBSC202T Course Name: Statistical Methods Lab		
Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 25 Marks

Course Objectives: The objective of the course is to

1) To understand fundamental concepts of data analysis using R programming.
2) To perform statistical operations on various datasets using R.
3) To apply advanced statistical techniques to analyze and interpret data.

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

CO1	Apply R programming to import and export data from real-life datasets.
CO2	Analyze data by computing summary statistics and visualizing results through graphs and tables.
CO3	Evaluate the results of hypothesis tests and regression analyses, interpreting the significance of findings.

Course Description:

This course provides hands-on training in applying statistical methods using R programming. Students will learn to import, manage, analyze, and visualize real-world datasets while performing key statistical operations. The lab emphasizes practical implementation of descriptive statistics, probability distributions, hypothesis testing, correlation, regression, and analysis of variance (ANOVA). Students will also gain experience in non-parametric tests and basic time series analysis. Through experiment-based learning, the course strengthens analytical thinking, problem-solving skills, and the ability to interpret statistical results for real-world decision-making in engineering, science, and data analytics applications.

Course Content

Sr. No.	Topic of Practical/Experiment/Tutorial	Assigned Hours
1	Explore data types in R and practice importing and exporting datasets.	02
2	Compute basic summary statistics (mean, median, mode) for a given dataset.	02
3	Create various plots (bar charts, histograms, scatter plots) to visualize data distributions.	02
4	Apply correlation techniques to examine relationships between two variables in a dataset.	02
5	Fit a simple linear regression model to a dataset and interpret the coefficient of determination (R^2).	02
6	Conduct a hypothesis test for a sample mean and proportion using real-time data.	02
7	Test the hypothesis for two sample means and proportions to	02

	compare groups.	
8	Perform ANOVA on a randomized block design dataset to analyze group differences.	02
9	Apply ANOVA techniques to a Latin square design dataset to examine treatments.	02
10	Use non-parametric tests (Sign test and Mann–Whitney test) to analyze datasets without normality assumptions.	02

Learning Resources:

Text Books

1) R-Software –Professional Version with 1+25 user ssubscription

Reference Books

1) Hands-on Programming with R-Garrett Grolemund
2) R for Everyone:Advanced Analytics and Graphics-Jared P.Lander

e-Books

1) Introduction to Probability and Statistics Using R (Free PDF)
   A complete textbook for probability, statistics, hypothesis testing, and R-based lab practice.
   https://unglue.it/work/308835/
   GitHub PDF: https://github.com/gjkerns/IPSUR
2) Deep R Programming (Free Online Book + PDF)
   https://deepr.gagolewski.com/

MOOC / NPTEL/YouTube Links

1) NPTEL — Descriptive Statistics with R Playlist
   R basics, frequency tables, plots, correlation, regression.
   🔗 https://www.youtube.com/watch?v=WbKiJe5OkUU
   Statistics LAB Practice Playlists

2) Hypothesis tests, confidence intervals, inference.
   🔗 https://www.classcentral.com/course/youtube-univariate-analysis-in-statistics-90303

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B.Tech)		
Course Code: 2601UCBSESC204 Course Name: Principles of Electronics Engineering		
Teaching Scheme	**Credit**	**Evaluation Scheme**
Lectures: 02 Hours/Week	**02**	**ISE: 20 Marks** **MSE: 20 Marks** **ESE: 60 Marks**

Prerequisites, if any: Basic understanding of electrical circuits and principles of electronics

Course Objectives: The objective of the course is to

1)	To understand the fundamental principles and characteristics of semiconductor devices.
2)	To develop skills in designing and analyzing various diode and transistor circuits.
3)	To apply basic concepts of operational amplifiers and digital electronics in practical applications.

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

		Bloom's Level
CO1	Understand and explain the formation and behavior of semiconductor junctions.	**Understand**
CO2	Apply diode and transistor characteristics to design and analyze electronic circuits.	**Apply**
CO3	Evaluate and implement operational amplifier configurations for different applications.	**Evaluate**
CO4	Understand and implement field-effect transistor principles and configurations.	**Understand**
CO5	Apply basic digital electronics principles to design and analyze logic circuits.	**Apply**

Course Description: This course offers an introduction to semiconductor devices and their applications. It covers the formation and characteristics of P-N junctions, diodes, and transistors, including both bipolar junction and field-effect transistors. The course also introduces operational amplifiers and basic digital electronics concepts, including logic gates, multiplexers, and flip-flops

Course Content

Unit-1	**Introductory idea of Semiconductors**	**6 Hours**

Formation of P-N junction, energy band diagram, built-in-potential, forward and reverse biased P-N junction, formation of depletion zone. Formation of PNP / NPN junctions, energy band diagram

Unit-2	**Diodes and Diode Circuits**	**6 Hours**

V-I characteristics, Zener breakdown, Avalanche breakdown and its reverse characteristics; Junction capacitance and Varactor diode. Simple diode circuits, load line, linear piecewise model; Rectifier circuits: half wave, full wave, PIV, DC voltage and current, ripple factor, efficiency, idea of

regulation

Unit-3	Bipolar Junction Transistors	6 Hours

Transistor mechanism and principle of transistors, CE, CB, CC configuration, transistor characteristics: cut-off active and saturation mode

Unit-4	Field Effect Transistors	6 Hours

Concept of Field Effect Transistors (channel width modulation), Gate isolation types, JFET Structure and characteristics, MOSFET Structure and characteristics, depletion and enhancement type; CS, CG, CD configurations; CMOS: Basic Principles

Unit-5	Operational amplifier basics	6 Hours

Introduction to integrated circuits, operational amplifier and its terminal properties. Application of operational amplifier; inverting and non-inverting mode of operation, Proportional, Integral, Derivative circuits

Unit-6	Basic ideas of Digital electronics	6 Hours

Basic idea of switching circuit, Realization of Logic gates, multiplexers and demultiplexers, Flip flop, Registers and Counters

Learning Resources:

Text Books

1)	Electronic Devices and Circuits – 8th edition 2005 - R. Boylestad& L. Nashelsky and – PHI
2)	Electronic Devices and Circuits – Allen Mottershed and – PHI
3)	Fundamentals of Digital Circuits – Anand Kumar and – PHI

Reference Books

1)	Electronic Devices and Circuits – 4th edition - David A. Bell and – PHI
2)	Electronic Devices and Circuits – 2nd edition - William I. Fletcher and - PHI/ Pearson

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	1	-	-	-	-	-	-	-
CO2	3	1	-	1	-	-	-	-	-	-	-
CO3	3	-	3	2	-	-	-	-	-	-	-
CO4	3	2	1	1	-	-	-	-	-	-	-
CO5	3	2	-	2	-	-	-	-	-	-	-

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

Course Code: 2601UCBSESC204P Course Name: Principles of Electronics Engineering - Lab

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 25 Marks POE: 50 Marks

Course Objectives: The objective of the course is to

1)	To Understand the principles of diodes and diode circuits
2)	To Learn the principles of bipolar junction transistors and field effect Transistor.
3)	To Learn the working of operational amplifiers and digital electronic

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

CO1	Explain operation of diode and its applications.
CO2	Understand the concept of BJT and FET & its applications.
CO3	Understand the concept of operational amplifiers and digital electronics.

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Assigned Hours
1	Performance Evaluation of a Half-Wave Rectifier	2 Hours
2	Performance Evaluation of a Full-Wave Rectifier	2 Hours
3	Investigation of Transistor Characteristics	2 Hours
4	Examination of Oscillator Circuits	2 Hours
5	Implementation of Integrator and Differentiator Using Operational Amplifier	2 Hours
6	Exploration of Basic Logic Gates	2 Hours
7	Design and Simulation of Half and Full Adders	2 Hours
8	Implementation of Multiplexers and Demultiplexers	2 Hours
9	Study and Application of Shift Registers	2 Hours
10	Performance Evaluation of a Half-Wave Rectifier	2 Hours

Learning Resources:

Text Books

1)	Electronic Devices and Circuits -8th edition 2005- R. Boylestad& L. Nashelsky and - Prentice Hall
2)	Electronic devices & circuits - Allen Mottershed and- PHI
3)	Fundamentals of Digital Circuits- Anand Kumar and- PHI

Reference Books

1)	Electronic devices & circuits – IV edition- David A. Bell - Prentice- Hall India
2)	Electronic devices & circuits - II edition- Millman & C.Halkias - Tata McGraw Hill Publication
3)	An Engineering Approach to Digital Design - William I. Fletcher - PHI/ Pearson

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	1	2	2	-	-	-	-	-	-	-
CO2	2	2	2	1	-	-	-	-	-	-	-
CO3	2	2	2	1	-	-	-	-	-	-	-

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B.Tech)		
Course Code: 2601UCBSPCC203 Course Name: Data Structure and Algorithms		
Teaching Scheme	**Credit**	**Evaluation Scheme**
Lectures: 03 Hours/Week	**03**	**IE: 20 Marks** **MSE: 20 Marks** **ESE: 60 Marks**

Prerequisites, if any:

7. Basic understanding o programming concepts

Course Objectives: The objective of the course is to

4) To understand fundamental concepts of algorithm and data structures.
5) To devlop Skills in implementing and analyzing linear and non-linear data structures.
6) To apply various algorithms for searching, sorting, and managing data efficiently.

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

CO1	**Understand** and explain fundamental concepts of algorithm and data structure.
CO2	**Apply** linear and non-linear data structures to solve various problems.
CO3	**Analyze** and evaluate the efficiency of searching and sorting algorithm.
CO4	**Implement** File organization methods and access schemes for efficient data management.
CO5	**Analyze and Apply** graph algorithms foe effective search and traversal

Course Description:

This course provides a comprehensive overview of stastical methods and interface techniques.it covers linear stastical models, estimation, hypothesis testing, analysis of varience , and non-parametric inference methods. The course also introduces basics of time series analysis and forecasting focusing on ARIMA models.

Course Content

Unit-1	**Basic Terminologies and introduction to algorithms & Data Organisation**	**5 Hours**
Algorithm Specification, Recursion, Performanance analysis, Asymptotic Notation-The Big-O , Omega and Theta Notation, Programming Style, Refinement Of Coding-Time Space Trade Off, Testing, Data Abstraction.		
Unit-2	**Linear Data Structure**	**7 Hours**
. Array, Stack, Queue, Linked List And Its Type, Various Representation, Operations & Applications of Linear Data Structures.		
Unit-3	**Non-Linear Data Structure**	**8 Hours**
Trees(Binary Tree, Threaded Binary Tree, Binary Search Tree, B & B+ tree , AVL Tree, Splay Tree), Applications Of Non- linear Data Structures.		

Unit-4	**Searching And Sorting On Various Data Structure**	**5 Hours**
Sequential Search, Binary Search, Comparison Search, Breadth First Search, Depth First Search Insertion Sort, Selection Sort, Shell Sort, Divide and Conquer Sort, Merge Sort, Quick Sort, Heap sort, Introduction to hashing.		
Unit-5	**Files**	**7 Hours**
Organization (sequential, Direct, Indexed Sequential, Hashed) and Various types of Accessing schemes.		
Unit-6	**Graphs**	**8 Hours**
Basic terminologies and Representations, Graph Search And Traversal algorithms and complexity analysis.		
Learning Resources:		
Text Books 5) E. Horowitz, S. Sahni, S. A-Freed (2008). Fundamentals of Data Structures. Universities Press. 6) A. V. Aho, J. E. Hopcroft, J. D. Ullman (1982). Data Structures and Algorithms. Pearson		
Reference Books • Donald E. Knuth (1997). The Art of Computer Programming: Volume 1: Fundamental Algorithms. Addison-Wesley • Thomas, H. Cormen, Charles E. Leiserson, R L. Rivest, Clifford Stein (2009). Introduction to Algorithms. PHI Learning Pvt. Ltd. • Pat Morin (2013). Open Data Structures: An Introduction (Open Paths to Enriched Learning).UBC Press.		
e-Books		
MOOC / NPTEL/YouTube Links 5) Data Structures and Algorithms Design - Course (nptel.ac.in) 6) https://nptel.ac.in/courses/106106130#:~:text=Course Abstract,practice as the course progresses.		

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

Course Code: 2601UCBSPCC203P Course Name: Data Structure and Algorithms

Teaching Scheme	Credit	Evaluation Scheme
Practical: 02 Hours/Week	01	ISA: 25 Marks POE: 50 Marks

Prerequisites, if any:

8. Basic knowledge of programming

Course Objectives: The objective of the course is to

4. To Understand and apply fundamental concepts of data structures in programming
5. To develop proficiency in implementing algorithms for searching and sorting.
6. To utilize abstract data types to address and solve practical computational problems.

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

CO1	Demonstrate the ability to develop programs that effectively manage and manipulate data
CO2	Apply searching and sorting techniques to efficiently organize and retrieve information.
CO3	Implement and operate various data structures to solve computational challenges.

Course Description:

This course provides a comprehensive overview of stastical methods and interface techniques. it covers linear stastical models, estimation, hypothesis testing, analysis of variances , and non-parametric inference methods. The course also introduces basics of time series analysis and forecasting focusing on ARIMA models.

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Assigned Hours
1	Implement binary search on a sorted array to find a given integer..	2
2	Develop a program to perform push, pop, and palindrome check operations on a stack.	2
3	Convert an infix expression to postfix using stack operations..	2
4	Implement a circular queue with insert, delete, and overflow/underflow detection.	2
5	Perform insertion, deletion, and display operations on a singly linked list.	2
6	Implement insertion, deletion, and double-ended queue operations on a doubly linked list.	2
7	Sort a list of integers using the selection sort algorithm.	2
8	Create and traverse a binary search tree, and search for a key. and quotes.	2

9	Implement hashing with the remainder method and resolve collisions using linear probing.	**2**
10	Implement a program to create a graph using an adjacency matrix and traverse it using DepthFirst Search (DFS) or Breadth-First Search (BFS).	**2**

Learning Resources:

Text Books

7) E. Horowitz, S. Sahni, S. A-Freed (2008). Fundamentals of Data Structures. Universities Press.
8) A. V. Aho, J. E. Hopcroft, J. D. Ullman (1982). Data Structures and Algorithms. Pearson

Reference Books

- Donald E. Knuth (1997). The Art of Computer Programming: Volume 1: Fundamental Algorithms. Addison-Wesley
- Thomas, H. Cormen, Charles E. Leiserson, R L. Rivest, Clifford Stein (2009). Introduction to Algorithms. PHI Learning Pvt. Ltd.
- Pat Morin (2 013). Open Data Structures: An Introduction (Open Paths to Enriched Learning).UBC Press.

MOOC / NPTEL/YouTube Links

7) Data Structures and Algorithms Design - Course (nptel.ac.in)
8) https://nptel.ac.in/courses/106106130#:~:text=Course Abstract,practice as the course progresses.

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B.Tech)		
Course Code: 2601UCBSCC205 Course Name: Fundamentals of Economics		
Teaching Scheme	**Credit**	**Evaluation Scheme**
Lectures: 02 Hours/Week	**02**	**IE: 20 Marks** **MSE: 20 Marks** **ESE: 60 Marks**

Prerequisites, if any: **Basic knowledge of introductory economics and mathematics.**

Course Objectives: The objective of the course is to

1)	To understand core concepts of microeconomics and macroeconomics.
2)	To analyse consumer behaviour and market structures.
3)	To apply economic theories to real-world scenarios and policy analysis.

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

		Bloom's Level
CO1	Explain fundamental microeconomic principles and their applications.	Understand
CO2	Apply welfare analysis concepts to evaluate consumer and producer surplus.	Apply
CO3	Analyse production functions and cost structures in different market conditions.	Evaluate
CO4	Understand and interpret key macroeconomic indicators and models.	Understand
CO5	Evaluate the effects of monetary and fiscal policies on business cycles and economic stability.	Apply

Course Description:

Course Content

Unit-1	**Microeconomics:**	**6 Hours**

Principles of Demand and Supply - Supply Curves of Firms - Elasticity of Supply; Demand Curves of Households - Elasticity of Demand; Equilibrium and Comparative Statics (Shift of a Curve and Movement along the Curve)

Unit-2	**Welfare Analysis:**	**6 Hours**

Consumers' and Producers' Surplus - Price Ceilings and Price Floors; Consumer Behaviour - Axioms of Choice - Budget Constraints and Indifference Curves; Consumer's Equilibrium - Effects of a Price Change, Income and Substitution Effects -Derivation of a Demand Curve; Applications - Tax and Subsidies - Intertemporal Consumption - Suppliers' Income Effect

Unit-3	Theory of Production:	6 Hours
Production Function and Iso-quants - Cost Minimization; Cost Curves - Total, Average and Marginal Costs - Long Run and Short Run Costs; Equilibrium of a Firm Under Perfect Competition; Monopoly and Monopolistic Competition.		
Unit-4	**Macroeconomics:**	**6 Hours**
National Income and its Components - GNP, NNP, GDP, NDP; Consumption Function; Investment; Simple Keynesian Model of Income Determination and the Keynesian Multiplier; Government Sector - Taxes and Subsidies; External Sector - Exports and Imports.		
Unit-5	**Money:**	**6 Hours**
Definitions; Demand for Money -Transitionary and Speculative Demand; Supply of Money - Bank's Credit Creation Multiplier; Integrating Money and Commodity Markets - IS, LM Model.		
Unit-6	**Business Cycles and Stabilization:**	**6 Hours**
Monetary and Fiscal Policy - Central Bank and the Government; The Classical Paradigm - Price and Wage Rigidities - Voluntary and Involuntary Unemployment.		

Learning Resources:

Text Books

1)	Microeconomics – 8th edition - Chris Chatfield - Pindyck, Robert S., and Daniel L. Rubinfeld and- Pearson
2)	Microeconomics – 12th edition - Dornbusch, Fischer and- McGraw Hill.
3)	Economics – 20th edition - P.A. Samuelson, W.D. Nordhaus and - McGraw Hill.
4)	Microeconomics – 8th edition - M.L. Jingan and – Vrinda publications, New Delhi.

Reference Books

1)	Intermediate Microeconomics: A Modern Approach – 8th edition - Hal R, Varian - Springer India Pvt. Ltd. India
2)	Principles of Macroeconomics – 7th edition - N. Gregory Mankiw - Cengage India Pvt. Ltd.

e-Books

1)	Principles of Economics by N. Gregory Mankiw
2)	Principles of Microeconomics by OpenStax
3)	Principles of Macroeconomics by OpenStax
4)	The Wealth of Nations by Adam Smith

MOOC / NPTEL/YouTube Links

1)	NPTEL – Economics Courses https://nptel.ac.in/courses/110105085
2)	NPTEL – Introduction to Microeconomics https://nptel.ac.in/courses/110/105/110105154

3)	NPTEL – Macroeconomics 🔗 https://nptel.ac.in/courses/110105156
4)	**Economics Courses:** 🔗 https://www.coursera.org/courses?query=economics

CO-PO Mapping:

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	1	-	-	-	-	-	-	-	-	-	1
CO2	-	2	3	1	-	-	-	-	-	-	-	-
CO3	-	-	-	1	-	-	-	-	-	-	-	1
CO4	-	-	1	1	1	-	-	-	-	-	-	1
CO5	-	2	-	-	-	-	-	-	-	-	-	1

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B.Tech)		
Course Code: 2601UCBSHSSM206 Course Name: Business Communication and Values- II		
Teaching Scheme	**Credit**	**Evaluation Scheme**
Lectures: 02 Hours/Week	**02**	**IE: 10 Marks** **MSE: 15 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 to

1)	To improve reading comprehension and writing proficiency
2)	To develop effective employment communication tools, including cover letters and resumes
3)	To enhance presentation skills and strategies for professional settings

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

		Bloom' Level
CO1	Understand and apply effective reading strategies to improve text comprehension and retention.	
CO2	Create and organize professional written documents	
CO3	Demonstrate effective communication skills during job interviews and group discussions.	
CO4	Design and deliver engaging professional presentations using advanced presentation techniques.	
CO5	Utilize life skills such as emotional intelligence	

Course Description:

This course provides a comprehensive introduction to both microeconomics and macroeconomics. It covers fundamental principles such as demand and supply, consumer behavior, and production theory. Students will explore key macroeconomic concepts including national income, money supply, and business cycles. The course also examines welfare analysis, the theory of production, and stabilization policies

Course Content

Unit-1	**Enhancing Reading and Writing Skills**	**5 Hours**

- Effective reading: Importance, types, overcoming common obstacles, tips and strategies
- Effective writing: Importance, paragraph writing techniques, journal/blog writing, Catherine Morris and Joanie McMahon's writing techniques

Unit-2	**Employment Communication**	**5 Hours**

- Covering letter and resume writing
- Group Discussion
- Interviews

Unit-3	Presentation Skills	5 Hours
Techniques of effective professional presentations, collaborative/team presentations.		
Unit-4	**Business Meetings**	**4 Hours**
Types of meetings, strategies of conducting meetings effectively, Documentation (notice, agenda, minutes)		
Unit-5	**Life Skills/SoftSkills-1:**	**4 Hours**
Developing personality Self-esteem: Know thyself		
Unit-6	**Life Skills/SoftSkills-2**	**5 Hours**
Emotional Intelligence, Leadership and Teamwork, Time management		

Learning Resources:

Text Books

1)	Communication Skills - 2013 edition- Meenakshi RamanandSangeeta Sharma and- Oxford University Press (OUP)
2)	Business Communication–2015edition-S. KaliaandS. Agarwaland–Wiley
3)	An Introduction to Professional English and SoftSkills-2012edition-Dasetaland Cambridge University Press

Reference Books

1)	Guiding Souls: Dialogues on the purpose of Life- 2015 edition - KalamA.A.Alred, G. J., - Prabhat Prakashan
2)	Handbook of Technical Writing – 10th edition - Brusaw, C. T., &Oliu, W. E.- St. Martin'sPress Sherman
3)	Skimming and Scanning Techniques- 2014 edition- Barbara - Liberty University
4)	Communication Skills for Engineers by S. Mishra & C. Muralikrishna (Pearson)
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://www.youtube.com/watch?v=3nLX0CjMO-Q
2)	https://www.youtube.com/watch?v=pHdzv1NfZRM
3)	https://www.youtube.com/watch?v=y8YH0Qbu5h4
4)	https://www.youtube.com/watch?v=BguYUJ7cWrs
5)	https://www.youtube.com/watch?v=CyXLhHQS3KY
6)	https://www.youtube.com/watch?v=gXId9M2w5LU
7)	https://www.youtube.com/watch?v=MnIPpUiTcRc
8)	https://www.youtube.com/watch?v=Mdtm5odjEzY
9)	https://www.youtube.com/watch?v=D6_J7FfgWVc
10)	https://www.youtube.com/watch?v=vlpKyLklDDY&t=22s
11)	https://www.youtube.com/watch?v=WXBA4eWskrc
12)	https://onlinecourses.swayam2.ac.in/ntr26_ed53/preview
13)	https://onlinecourses.nptel.ac.in/noc26_hs73/preview
14)	https://onlinecourses.nptel.ac.in/noc26_hs01/preview
15)	https://onlinecourses.nptel.ac.in/noc26_hs55/preview

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-
CO6	3	2	-	-	-	-	-	-	-	-	-

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

Course Code2601UCBSHSSM206T Course Name: Business Communication & Value Science –II- LAB

Teaching Scheme	Credit	Evaluation Scheme
Tutorial/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)	Enhance communication skills through effective group discussions and mock interviews
2)	Develop teamwork and leadership capabilities by creating and presenting a vision for an NGO.
3)	Cultivate presentation and documentation skills essential for business environments and professional settings

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

CO1	Analyse group discussions for communication strategies
CO2	Demonstrate interview techniques through mock interviews
CO3	Create and present business proposals effectively

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	Assigned Hours
1	**Beginner Group Discussion**: Learn tips and analyse individual performances.	02 Hours
2	**Master Group Discussion**: Conduct evaluations and progress checks.	02 Hours
3	**Beginner Mock Interview**: Explore interview FAQs and participate in mock interviews.	02 Hours
4	**Master Mock Interview**: Engage in prepared and formal mock interviews.	02 Hours
5	**NGO Formation**: Develop a vision, mission, and design a logo.	02 Hours
6	**PresentationSkills-Part1**:Present your NGO and receive audience feedback.	02 Hours
7	**Presentation Skills -Part2**:Address social issues through ICT-enhanced presentations.	02 Hours
8	**Business Meetings**: Draft documentation and participate in mock meetings.	02 Hours

9	**Business Proposals**: Collaborate on and present a business proposal.	02 Hours
10	**Life Skills Movie Session :**Analyse life skills and values from a selected film	02 Hours

Learning Resources:

Text Books

1)	Communication Skills - 2013 edition- Meenakshi RamanandSangeeta Sharma and- Oxford University Press (OUP)
2)	Business Communication–2015edition-S. Kaliaand S. Agarwaland–Wiley
3)	An Introduction to Professional English and SoftSkills-2012edition-Dasetaland Cambridge University Press

Reference Books

1)	Guiding Souls: Dialogues on the purpose of Life- 2015 edition - KalamA.A.Alred, G. J., - Prabhat Prakashan
2)	Handbook of Technical Writing – 10th edition - Brusaw, C. T., &Oliu, W. E.- St. Martin'sPress Sherman
3)	Skimming and Scanning Techniques- 2014 edition- Barbara - Liberty University
4)	Communication Skills for Engineers by S. Mishra & C. Muralikrishna (Pearson)
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://www.youtube.com/watch?v=3nLX0CjMO-Q
2)	https://www.youtube.com/watch?v=pHdzv1NfZRM
3)	https://www.youtube.com/watch?v=y8YH0Qbu5h4
4)	https://www.youtube.com/watch?v=BguYUJ7cWrs

5)	https://www.youtube.com/watch?v=CyXLhHQS3KY
6)	https://www.youtube.com/watch?v=gXId9M2w5LU
7)	https://www.youtube.com/watch?v=MnIPpUiTcRc
8)	https://www.youtube.com/watch?v=Mdtm5odjEzY
9)	https://www.youtube.com/watch?v=D6_J7FfgWVc
10)	https://www.youtube.com/watch?v=vlpKyLklDDY&t=22s
11)	https://www.youtube.com/watch?v=WXBA4eWskrc
12)	https://onlinecourses.swayam2.ac.in/ntr26_ed53/preview
13)	https://onlinecourses.nptel.ac.in/noc26_hs73/preview
14)	https://onlinecourses.nptel.ac.in/noc26_hs01/preview
15)	https://onlinecourses.nptel.ac.in/noc26_hs55/preview

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO1
CO1	3	2	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-
CO6	3	2	-	-	-	-	-	-	-	-	-

Tatyasaheb Kore Institute of Engineering and Technology First Year of Bachelor of Technology (F.Y. B.Tech)		
Course Code:2601UCBSVSEC207T Course Name: Web Designing LAB		
Teaching Scheme	Credit	Evaluation Scheme
Tutorial/Practical: 02 Hours/Week	01	ISA: 25 Marks POE: 25 Marks

Prerequisites, if any:

- Basic knowledge of computers and internet usage
- Familiarity with using web browsers (e.g., Google Chrome, Mozilla Firefox)
- Understanding of file handling (creating, saving, and organizing files)

Course Objectives: The objective of the course is to

1)	To Develop foundational knowledge of web technologies and the structure of web pages.
2)	To Foster problem-solving skills by designing and implementing functional, user-friendly web interfaces.
3)	To Encourage creativity in web development by applying best practices and innovative design techniques.

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

CO1	**Create** static web pages with text, images, and links.	**Create**
CO2	**Develop** functional web forms for user input.	**Develop**
CO3	**Design** accessible web pages using HTML5 semantic elements.	**Develop**

Course Description:

This course introduces the fundamentals of web development using HTML. Students learn to create structured webpages using elements such as headings, paragraphs, lists, images, links, tables, and forms. It also covers multimedia integration and HTML5 semantic tags like <header>, <footer>, and <section>. By the end, students will be able to design simple static and multi-page websites focusing on content and structure without using CSS.

Course Content

Sr. No.	Topic of Practical / Experiment / Tutorial	Assigned Hours
1	**Create** a simple webpage using basic HTML elements like headings, paragraphs, and lists.	**2**
2	**Design** a webpage demonstrating various text formatting options like bold, italic, and underline.	**2**
3	**Add** an image and hyperlinks to a webpage with proper alt text and clickable links.	**2**
4	**Build** a table to display data with column and row spans for better formatting.	**2**
5	**Create** a form with input fields, checkboxes, radio buttons, and a submit button to collect user information.	**2**

6	**Embed** a video and audio file into a webpage with proper descriptions and controls.	**2**
7	**Implement** HTML5 semantic elements like `<header>`, `<footer>`, and `<section>` to structure a webpage.	**2**
8	**Develop** a webpage with a navigation bar using unordered lists for internal or external linking.	**2**
9	**Design** an image map with clickable areas that link to different pages or sections.	**2**
10	**Create** a simple multi-page website with a homepage, about page, and contact page without using CSS.	**2**

Learning Resources:

Text Books

1)	J. Duckett, ***HTML and CSS: Design and Build Websites***. Hoboken, NJ: John Wiley & Sons
2)	J Robbins, ***Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics***, 5th ed. Sebastopol, CA: O'Reilly Media, 2018.

Reference Books

1)	Robbins**, *Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics,*** 5th ed. Sebastopol, CA: O'Reilly Media, 2018**.**
2)	**M**. MacDonald**, *HTML5: The Missing Manual,*** 2nd ed. Sebastopol, CA: O'Reilly Media

e-Books

1)	HTML and CSS: Design and Build Websites – Beginner-friendly with visual explanations
2)	Learning Web Design – Comprehensive introduction to HTML5
3)	Head First HTML and CSS – Interactive and easy-to-understand
4)	HTML5: The Missing Manual – Covers modern HTML features

MOOC / NPTEL/YouTube Links

1)	NPTEL – *Programming in HTML5 with JavaScript and CSS3* https://nptel.ac.in/courses
2)	SWAYAM – Web Development courses https://swayam.gov.in
3)	Coursera – *HTML, CSS, and Javascript for Web Developers* https://www.coursera.org
4)	edX – ***Introduction to Web Development*** https://www.edx.org
5)	Udemy – HTML & Web Development beginner courses https://www.udemy.com

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	3	1	2	2	-	-	-	-	-	-
CO2	2	3	1	1	2	-	-	-	-	-	-
CO3	2	3	2	2	2	-	-	-	-	-	-