CURRICULUM AND DETAILED SYLLABI

FOR

B.TECH DEGREE (Fashion Technology) PROGRAMME

FIRST SEMESTER

FOR THE STUDENTS ADMITTED FROM THE

ACADEMIC YEAR 2026 – 2027 ONWARDS

THIAGARAJAR COLLEGE OF ENGINEERING

(A Government Aided ISO 9001-2008 Certified

Autonomous Institution affiliated to Anna University)

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THIAGARAJAR COLLEGE OF ENGINEERING: MADURAI – 625 015

B. E./ B.Tech. DEGREE PROGRAMMES

CREDIT DISTRIBUTION

(For the students admitted from the Academic Year 2026-27 onwards)

Sl. No.	Category	Credits	
		Regular	**Lateral Entry**
A.	Humanities and Social Sciences including Management Courses (HSMC)	11	8
B.	Basic Science Courses (BSC)	22	6
C.	Engineering Science Courses (ESC)	23	12
D.	Program Core Courses (PCC)	75	62
E.	Program Elective Courses (PEC)	21	21
F.	Open Elective Courses (OEC)	6	6
G.	Employability Enhancement Courses (EEC)	16	16
H.	Internship and Mandatory Audit Courses (AC) as per Regulatory authorities (Non-Credit and not included in CGPA)	-	-
	Minimum Credits to be earned for the award of the Degree	**174**	**131**
		From A to G and the successful completion of H	

Approved in 71st Academic Council Meeting 27.06.2026

Sem	Theory / Theory cum Practical / Practical						CDIO Courses	Audit Courses	Credit
I	26MASA0 Applied Calculus for Engineers (BSC-4)	26CHSD0 Textile Chemistry (BSC-3)	26EGHA0 Technical English (HSMC-3)	26FTCA0 Evolution of Fashion Design (PCC-4)	22MEEA0 Engineering Graphics (ESC-3)	26CHSC0 Textile Chemistry Lab (BSC-1)	26CCEA0 Introduction to Engineering (TCP) (ESC-2)	26TAAA0 Heritage of Tamil 26CCAA0 Vision and Speed Maths (AC-0)	20

26MASA0	Applied Calculus for Engineers	Category	L	T	P	Credit
		BSC	3	1	0	4

1. Preamble

Applied calculus addresses the fundamental concepts of single and multivariable calculus with emphasis on engineering applications and problem solving. Focuses on modeling and analysis of engineering systems through derivatives and integrals. Develops analytical skills to analyze and solve real-world systems using derivatives and multiple integrals.

2. Prerequisite

- Nil

3. Course Outcome

After the successful completion of the course, students will be able to:

CO	Course Outcomes	TPS Level	Performance Indicator	CO Weightage	SDG addressed	SDG Level
CO1	Use functions, limits, continuity, and derivatives to solve mathematical and technical problems.	TPS3	1.1.1	18%	SDG4	2
CO2	Apply derivatives to determine extrema and characterize behavior of single variable functions.	TPS3	1.1.1	18%	SDG4	2
CO3	Compute partial derivatives to determine extrema of multivariable functions.	TPS3	1.1.1	18%	SDG4	2
CO4	Apply techniques of double integrals to compute areas and volumes of bounded regions.	TPS3	1.1.1	16%	SDG4	2
CO5	Apply double integrals to determine physical quantities such as density,mass, moments, center of mass, and moments of inertia and Surface Area.	TPS3	1.1.1	12%	SDG4	2
CO6	Compute volumes using triple integrals in Cartesian, Cylindrical, and Spherical coordinates.	TPS3	1.1.1	18%	SDG4	2

4.Assessment Pattern

CO	CAT1	Assignment 1	CAT2	Assignment 2	Terminal Exam
	% of Marks	% of Marks	% of Marks	% of Marks	% of Marks
CO1	33	33			18
CO2	33	33			18
CO3	34	34			18
CO4			38	38	16
CO5			24	24	12
CO6			38	38	18
Total	100	100	100	100	100

Activities are given for self-study using mathematical software. They can be tested through open ended assignments.

5.Syllabus

Foundations of Differential Calculus: New functions from old functions - Limit of a function and Continuity of a function - Limits at infinity - Derivative as a function.

Activities: Visualization of the functions, model and solve scientific and engineering phenomena using concept of function, limits, continuity, intermediate value theorem and derivatives. Solving Competitive Examination problems with emphasis to GATE

Applications of Differential Calculus: Maxima and Minima of functions of single variable - The Mean value theorem - Effect of derivatives on the shape of the graph of a function.

Activities: Model and solve scientific, engineering phenomena using concept of Maxima and Minima of a function, Rolle's Theorem and mean value theorem and derivatives. Solve Competitive Examination problems with emphasis to GATE

Partial Derivatives and its Applications: Partial derivatives - Chain rule - Maxima and minima of functions of two variables - Method of Lagrange's Multipliers for function with single constraint.

Activities: Model and solve scientific, engineering phenomena using concept Partial derivatives, Chain rule, Maxima and minima of functions of two variables, Method of Lagrange's Multipliers. Solve Competitive Examination problems with emphasis to GATE.

Double Integrals and its Applications: Iterated integrals and Fubini's theorem - Double integrals over general regions - Changing the order of integration - Properties of double integrals - Double integrals in polar coordinates – Applications of double integrals (Density, Mass, Moments & Moments of Inertia problems only) - Surface area.

Activities: Using the concept of Double integrals, model and solve scientific, engineering phenomena. Solve Competitive Examination problems with emphasis to GATE

Triple Integrals and its Applications: Triple integrals over rectangular boxes - Triple integrals over general regions - Triple integrals in cylindrical coordinates - Triple integrals in spherical coordinates.

Activities: Model and solve scientific, engineering phenomena using concept of Triple integrals in Cartesian, cylindrical and spherical coordinates. Solve Competitive Examination problems with emphasis to GATE.

6. Learning Resources

6.1 Text Book

1) James Stewart, Daniel Clegg and Saleem Watson, "Calculus Early Transcendentals", 9th edition, Cengage Learning, New Delhi, 2019.
   Foundations of Differential Calculus: [1.3, 2.2, 2.5, 2.6, 2.8]
   Applications of Differential Calculus: [4.1, 4.2, 4.3]
   Partial Derivatives and its Applications: [14.3, 14.5, 14.7, 14.8]
   Double Integrals and its Applications: [15.1, 15.2, 15.3, 15.4, 15.5]
   Triple Integrals and its Applications: [15.6, 15.7, 15.8]

6.2 Reference Books & Web Resources

1) George B. Thomas, "Thomas Calculus: Early Transcendentals", 14th Edition, Pearson Publishers, New Delhi, 2018.
2) Howard Anton, Irl Bivens and Stephen Davis, “Calculus: Early Transcendentals”,12thedition, John Wiley & Sons, 2021.
3) Kuldeep Singh, "Engineering Mathematics Through Applications", 2nd edition, Blooms berry publishing, 2019,
4) Kuldip S. Rattan, Nathan W. Klingbeil, Craig M. Baudendistel, “Introductory Mathematics for Engineering Applications”, 2nd edition, John Wiley& Sons, 2021.
5) Ron Larson and David C. Falvo, “Calculus: an Applied Approach”. 10th edition Cengage Learning 2015.
6) https://onlinecourses.nptel.ac.in/e-learning/preview/noc25_ma79
7) https://ocw.mit.edu/courses/18-01-calculus-i-single-variable-calculus-fall-2020/
8) https://in.mathworks.com/matlabcentral/fileexchange/?q=calculus+applications

7. Course Contents and Lecture Schedule

Module No.	Topic	Periods
1	**Foundations of Differential Calculus**	
1.1	New functions from old functions	1
1.2	The Limit of a function	1
1.3	Continuity of a function	1
	Tutorial	1
1.4	Limits at infinity	1
1.5	The Derivative as a function	2
	Tutorial	1
2	**Applications of Differential Calculus**	
2.1	Maxima and Minima of functions of single variable	3
	Tutorial	1
2.2	The Mean value theorem	1
2.3	Effect of derivatives on the shape of a graph of a function	2
	Tutorial	1
3	**Partial Derivatives and its Applications**	
3.1	Partial derivatives	1
3.2	Chain rule	2
	Tutorial	1

3.3	Maxima and minima of functions of two variables	1
3.4	Method of Lagrange's Multipliers for function with single constraint	2
	Tutorial	1
4	**Double Integrals**	
4.1	Iterated integrals and Fubini's theorem	1
4.2	Double integrals over general regions	2
	Tutorial	1
4.3	Changing the order of integration	2
4.4	Properties of double integrals (without proof), Change of Variables from Cartesian to Polar Coordinates	1
	Tutorial	1
4.5	Double Integrals in Polar coordinates	1
4.6	Applications of double integrals (Density, Mass, Moments)	1
4.7	Applications of double integrals (Moments of Inertia)	1
	Tutorial	1
4.8	Surface area	2
5	**Triple Integrals**	
5.1	Triple integrals over Rectangular Boxes	1
	Tutorial	1
5.2	Triple integrals over general regions	2
5.3	Change of Variables from Cartesian to Cylindrical and Spherical Coordinates	1
	Tutorial	1
5.4	Triple integrals in cylindrical coordinates	2
5.5	Triple integrals in spherical coordinates	1
	Tutorial	1
	Total	**48**

8.Course Designer(s):

1. Dr. B. Vellaikannan, Professor, Dept. of Mathematics, bvkmat@tce.edu
2. Dr. C. S.Senthilkumar , Assistant Professor, Dept. of Mathematics, kumarstays@tce.edu
3. Dr. A. Anitha, Assistant Professor, Dept. of Mathematics, anithavalli@tce.edu
4. Ms.H. Srivinodhini, Assistant Professor, Dept. of Mathematics, srivinodhini@tce.edu
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		Category	L	T	P	Credit
26CHSD0	**FUNDAMENTALS OF TEXTILE CHEMISTRY**		3	0	0	3

1. Preamble

This course introduces fibre chemistry, dyeing processes, spectroscopic analysis, and water quality management in textile industries. It emphasizes fibre properties, dye-fibre interactions, analytical techniques, textile effluent treatment, and sustainable industrial practices relevant to textile and dye manufacturing applications.

2. Prerequisite

Nil

3. Course Outcomes

After the successful completion of the course, students will be able to:

No.	Course Outcome	TPS Level	Performance Indicator	CO Weightage	SDG addressed	SDG Level
CO1	Explain the classification, chemical composition, molecular structure, and properties of natural and synthetic fibres, including their degree of polymerisation, crystallinity, and moisture absorption characteristics.	TPS2	1.2.1	10 %	SDG 9, SDG 12	2
CO2	Select textile fibres using chemical tests, microscopic examination, and burn tests, and identify appropriate bleaching methods for different fibre types.	TPS3	1.2.1	20 %	SDG 9, SDG 12	2
CO3	Classify dyes based on their chemical nature and apply suitable dyeing techniques for natural and synthetic fibres, evaluating dye-fibre interactions and fastness properties.	TPS3	1.2.1	20 %	SDG 6, SDG 9, SDG 12	2
CO4	Apply UV-visible, fluorescence, FTIR, and ICP emission spectroscopic techniques to analyse dyes, pigments, and textile materials, interpreting the relationship between colour and chemical constitution.	TPS3	1.2.1	20 %	SDG 9, SDG 12	2
CO5	Analyse water quality parameters relevant to textile industries and apply appropriate water softening, desalination, and effluent treatment methods for sustainable textile processing.	TPS3	1.2.1	20 %	SDG 6, SDG 12, SDG 13	2
CO6	Use techniques for dye degradation and implement IoT-based sensor systems for monitoring water quality in textile and dye industries.	TPS3	1.2.1	10 %	SDG 6, SDG 9, SDG 12	2

Note: TPS Level (TPS1–TPS5), PI format (x.y.z), Total CO weightage = 100%

4. Assessment Pattern

CO	CAT1	Assignment 1	CAT2	Assignment 2	Terminal Exam
	% of Marks	% of Marks	% of Marks	% of Marks	% of Marks
CO1	20	-	-	-	10
CO2	40	50	-	-	20
CO3	40	50	-	-	20
CO4	-	-	40	50	20
CO5	-	-	40	-	20
CO6	-	-	20	50	10
Total	100	100	100	100	100

Note: CO-wise assessment must align with CO weightage.

5. Syllabus

CHEMISTRY OF FIBRES

Classification of fibers, chemical composition, molecular structure and properties (degree of polymerisation, crystallinity, and moisture absorption) of fibres –Natural fibres; cotton, wool, silk, jute- Syntheric fibres - modified cellulose fibres, Polyamide, Poly ester; Fibre identification by chemical tests, microscopy, and burn tests; Bleaching – purpose and methods

[9 hours]

DYEING PROCESS

Concept of dyes, Natural dyes: Indigo, Henna - Synthetic dyes: azo dyes. General properties for dyes; Classification of dyes and dyeing of fibres; Dye-fibre interactions, Dyeing of natural fibres - cotton, wool and silk; synthetic fibres - nylon, terylene; fastness properties of dyed materials – Concept of colour index and its significance

[9 hours]

SPECTROSCOPIC TECHNIQUES FOR TEXTILE AND DYE INDUSTRIES

Electromagnetic radiation and its interactions with matter – Relationship between colour and chemical constitution. Principle and instrumentation of UV-visible, fluorescence, FTIR and Inductively Coupled Plasma emission spectroscopic techniques for analysis of dyes and pigments. Applications in textile and dye industries

[9 hours]

WATER QUALITY AND MANAGEMENT

Water Quality parameters: Textile industries - Physical, Chemical and Biological – Hardness of water: types -determination of hardness by EDTA method – Softening of water: Ion-Exchange method, Desalination process: forward and reverse osmosis, solar distillation, Textile Effluent Treatment. Dye degradation: Treatment and methods. IoT-based sensor for water quality monitoring

[9 hours]

6. Learning Resources

1. Chatwal, R. (2009). Synthetic Dyes. Mumbai: Himalayan Publishing House.
2. Sadov, F., & Horchagin, M. (1978). Chemical Technology of Fibrous Materials- A. Matetshy. U.S.A: Mir Publishers Easton's Books. Inc. Mount Vernon.
3. Joseph, M. L., Hudson, P. B., Clapp, A. C., & Kness, D. (1993). Joseph's

Introductory Textile Science (VI Edition). Fort Worth: Harcourt Brace Jovanovich College Publishers.
4. Luniak, B. (1953). The Identification of Textile Fibres: The Identification of Textile Fibres: Qualitative and Quantitative Analysis of Fibre Blends. London: Pitman Publisher.
5. Mather, R. R., and Wardman, R. H., The Chemistry of Textile Fibres, 2nd Edition (2015) Published by The Royal Society of Chemistry, Thomas Graham House, UK

6.1 Text Book

1. Sharma, B. K. (1997). Industrial Chemistry. New Delhi: Goel Publishing Co.
2. Prayag. R. S. (1989). Dyeing of Wool, Silk and Manmade Fibres. Dharwad: Noves Data Corporation.
3. Shenai. V. A. (1973). Chemistry of Dyes and Principles of Dyeing. Bombay: Sevak Publication.
4. Shenai. V. A. (1980). Technology of Textile Processing. Bombay: Sevak Publication.
5. Carr. C. M. (1995). Chemistry of the Textiles Industry.Blackie Academic & Professional Publication.
6. Marsh,J .T. (2001). Textile Science. B.I. Publications, Bombay.

6.2 Reference Books & Web resources

- S.S. Dara and S.S. Umare, “A Textbook of Engineering Chemistry”, S.Chand & Company, 12th Edition, Reprint, 2022.
- V. K. Ahluwalia, Instrumental Methods of Chemical Analysis, Springer Cham, 1st Edition, 2023.

7. Course Contents and Lecture Schedule

Module No.	Topic	No. of Periods
1	**CHEMISTRY OF FIBRES**	
1.1	Classification of fibres	2
1.2	Chemical composition, molecular structure and properties of fibres (degree of polymerisation, crystallinity and moisture absorption)	2
1.3	Natural fibres: Cotton, Wool, Silk and Jute	1
1.4	Synthetic fibres: Modified cellulose fibres, Polyamide and Polyester	1
1.5	Fibre identification by chemical tests, microscopic examination and burn tests	2
1.6	Bleaching: Purpose and methods	1
2	**DYEING PROCESS**	
2.1	Concept of dye	1
2.2	Natural dyes: Indigo and Henna Synthetic dyes: Azo dyes	2

2.3	General properties and classification of dyes	1
2.4	Dyeing of fibres and dye-fibre interactions	1
2.5	Dyeing of natural fibres: Cotton, Wool and Silk	1
2.6	Dyeing of synthetic fibres: Nylon and Terylene	1
2.7	Fastness properties of dyed materials	1
2.8	Colour Index and its significance	1
3.0	**SPECTROSCOPIC TECHNIQUES FOR TEXTILE AND DYE INDUSTRIES**	
3.1	Electromagnetic radiation and its interactions with matter	1
3.2	Principle and instrumentation of UV-Visible spectroscopy	2
3.3	Principle and instrumentation of fluorescence	2
3.4	Principles and instrumentation of, FTIR	1
3.5	Inductively Coupled Plasma (ICP) Emission Spectroscopy	1
3.6	Analysis of dyes and pigments	1
3.7	Applications in textile and dye industries	1
4.0	**WATER QUALITY AND MANAGEMENT**	
4.1	Importance of water, Water Quality parameters: Textile industries, physical, chemical & biological	2
4.2	Hardness of water - types, units. Determination of hardness by EDTA method and numerical problems	2
4.3	Softening of water: Ion-Exchange method	1
4.4	Desalination process: forward and reverse osmosis, solar distillation	1
4.5	Textile Effluent Treatment. Dye degradation methods	2
4.6	IoT-based sensor for water quality monitoring	1

8. Course Designer(s):

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26CHSC0	CHEMISTRY LABORATORY	Category	L	T	P	Credits
		BSC	0	0	2	1.0

Preamble

This course aims to provide the students with basic practical knowledge in chemistry. The objective of this course is to develop students' intellectual and psychomotor skills by providing hands-on experience in quantitative analysis, electrochemistry, physicochemistry, photocolorimetry, and green nanomaterial synthesis techniques.

Prerequisite

NIL

Course Outcomes

On the successful completion of the course, students will be able to

COs	Course Outcome	TCE Proficiency Scale	Performance Indicators	SDG Addressed	SDG Level
CO1	Operate pH meters, conductivity bridges, colourimeters, potentiometric systems, and volumetric apparatus to determine physicochemical properties of engineering samples.	TPS 3	5.2.1	SDG 9 – Industry, Innovation and Infrastructure	2
CO2	Measure readings from volumetric, and instrumental methods to determine concentration of chemical and water samples.	TPS 3	4.1.2	SDG 6 – Clean Water and Sanitation	2
CO3	Demonstrate precise laboratory techniques, including pipetting, burette handling, endpoint detection, calibration, and solution preparation during quantitative chemical analysis.	TPS 3	5.3.1	SDG 4 – Quality Education	2
CO4	Apply laboratory safety procedures, chemical handling practices, and waste disposal protocols during analytical and electrochemical experiments.	TPS 3	6.4.1	SDG 12 – Responsible Consumption and Production	2
CO5	Demonstrate structured laboratory reports by interpreting observations, calculations, graphs, error analysis, and experimental conclusions using scientific documentation practices.	TPS 3	9.1.2	SDG 4 – Quality Education	2
CO6	Apply collaborative responsibilities ethically during experimentation, data recording, analysis, and laboratory discussions.	TPS 3	8.2.1	SDG 16 – Peace, Justice and Strong Institutions	2
CO7	Analyse deviations and experimental errors in titrimetric, electrochemical, and instrumental methods, and recommend	TPS 4	4.3.1	SDG 9 – Industry, Innovation and Infrastructure	2

	corrective measures to improve analytical accuracy.				
CO8	Evaluate electrochemical behaviour, corrosion characteristics, and electroplating efficiency of metallic systems using modern electrochemical techniques.	TPS 5	3.3.1	SDG 9 – Industry, Innovation and Infrastructure	2

Assessment Pattern: Cognitive Domain

Type of Assessment	Component	Marks	Remarks
Continuous Assessment	Pre-Lab, In-Lab, and Post-Lab Activities	75	Conducted throughout the semester as per laboratory assessment framework and openness levels specified in the curriculum guidelines.
Model Test	CO-wise Assessment covering Cognitive, Psychomotor, and Affective Domains	25	Mid-semester / End-semester internal practical assessment using structured rubrics aligned with all three learning domains.
Total Internal Marks		**100**	Continuous Assessment (75) + Model Test (25).
End Semester Examination	CO-wise Assessment covering Cognitive, Psychomotor, and Affective Domains	100	Conducted as per COE regulations and curriculum requirements using structured laboratory evaluation rubrics.

List of Experiments with CO Mapping

Sl. No.	Name of the Experiment	Level of Experiment	Objective(s)	COs Addressed
1.	Estimation of Total Hardness of Water	Level 1	Instrumentation, Data Analysis, Psychomotor Skills	CO1, CO2, CO3, CO4, CO5
2.	Estimation of Calcium in a Milk Sample	Level 1	Experimentation, Data Analysis, Psychomotor Skills	CO2, CO3, CO5, CO6
3.	Estimation of Chemical Oxygen Demand in Effluent	Level 2	Experimentation, Data Analysis, Safety	CO1, CO2, CO4, CO5, CO7
4.	Determination of the Surface Tension of a Liquid	Level 2	Instrumentation, Models, Psychomotor Skills	CO1, CO2, CO3, CO5
5.	Estimation of Antacid in a Tablet	Level 1	Experimentation, Data Analysis,	CO2, CO3, CO5

			Psychomotor Skills	
6.	Estimation of Acid Strength in Citrus Fruit	Level 1	Experimentation, Data Analysis, Psychomotor Skills	CO2, CO3, CO5, CO6
7.	Determination of the Molecular Weight of a Polymer by the Ostwald Viscometer	Level 2	Models, Instrumentation, Data Analysis	CO1, CO2, CO5, CO7
8.	Estimation of Acidic Impurities in Soft Drinks by the Conductometric Method	Level 2	Instrumentation, Data Analysis, Learn from Failure	CO1, CO2, CO5, CO7
9.	Estimation of the pH of a Soil Sample	Level 1	Instrumentation, Psychomotor Skills, Data Analysis	CO1, CO3, CO4, CO5
10.	Estimation of Fe^{2+} using the Potentiometric Method	Level 2	Instrumentation, Experimentation, Data Analysis	CO1, CO2, CO5, CO7
11.	Green Synthesis of Plasmonic Silver Nanoparticles Using Plant Extract and Quantitative Analysis by Photocolorimetry	Level 2	Instrumentation, Experimentation, Data Analysis, Creativity	CO1, CO2, CO5, CO7, CO8
12.	Estimation of the rate of Corrosion of a Metal Specimen by Electrochemical Method	Level2	Instrumentation, Experimentation, Data Analysis,	CO1, CO2, CO5, CO7, CO8

Course Designer(s):

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3.3	Maxima and minima of functions of two variables	1
3.4	Method of Lagrange's Multipliers for function with single constraint	2
	Tutorial	1
4	**Double Integrals**	
4.1	Iterated integrals and Fubini's theorem	1
4.2	Double integrals over general regions	2
	Tutorial	1
4.3	Changing the order of integration	2
4.4	Properties of double integrals (without proof), Change of Variables from Cartesian to Polar Coordinates	1
	Tutorial	1
4.5	Double Integrals in Polar coordinates	1
4.6	Applications of double integrals (Density, Mass, Moments)	1
4.7	Applications of double integrals (Moments of Inertia)	1
	Tutorial	1
4.8	Surface area	2
5	**Triple Integrals**	
5.1	Triple integrals over Rectangular Boxes	1
	Tutorial	1
5.2	Triple integrals over general regions	2
5.3	Change of Variables from Cartesian to Cylindrical and Spherical Coordinates	1
	Tutorial	1
5.4	Triple integrals in cylindrical coordinates	2
5.5	Triple integrals in spherical coordinates	1
	Tutorial	1
	Total	**48**

8.Course Designer(s):

1. Dr. B. Vellaikannan, Professor, Dept. of Mathematics, bvkmat@tce.edu
2. Dr. C. S.Senthilkumar , Assistant Professor, Dept. of Mathematics, kumarstays@tce.edu
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4. Ms.H. Srivinodhini, Assistant Professor, Dept. of Mathematics, srivinodhini@tce.edu
5. Dr. S. Saravanakumar, Assistant Professor, Dept. of Mathematics, sskmat@tce.edu
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26EGHA0	TECHNICAL ENGLISH	Category	L	T	P	C	T	Credit	Hours
		HSMC	2	0	2	3			
		Terminal Exam Type-Theory							

Preamble

Technical English is a course that develops essential communication skills for academic and professional engineering contexts. The course integrates reading, writing, speaking, and listening through authentic technical and workplace-based activities.

Prerequisite

(NIL)

Course Outcomes

On the successful completion of the course, students will be able to

No.	Course Outcome	TPS Level	Performance Indicator	CO Weightage	SDG Addressed	SDG Level
CO1	Describe technical texts, engineering manuals, and academic articles, extracting key information and inferring meaning from context.	TPS2	9.1.1	20%	4	1
CO2	Explain context-appropriate vocabulary and grammatical accuracy in technical writing including reports, Instructions, and Interpretation.	TPS2	9.1.2	20%	4	2
CO3	Prepare agendas, notices, and minutes of meetings following standard organizational formats and communication protocols.	TPS3	9.1.3	20%	8	3
CO4	Demonstrate and deliver effective technical presentation slides using visual clarity, proper formatting, and appropriate data representation techniques.	TPS3	9.2.2	20%	4	2
CO5	Apply professional and ethical communication skills in social media and workplace digital communication using proper netiquette and sentence construction.	TPS3	9.3.2	20%	9	3

Assessment Pattern

CO	Assessment 1						Assessment 2			Terminal (%)		
	Written Test 1 (%)			Assignment 1 (%)			Lab Activities					
TPS	1	2	3	1	2	3	1	2	3	1	2	3
CO1	10%	10%		100%			10%	10%		-	20	-

									%	
CO2	10%	10%			10%	10%		-	20 %	
CO3		10%	10%			10%	10%	-	-	30%
CO4		10%	10%	-		10%	10%	-	-	20%
CO5			20%	-			20%	-	-	10%
TOTAL	**100%**			**100%**	**20%**	**40%**	**40%**	**100%**		

Syllabus

Module1:

Technical Reading & Vocabulary Development:

Technical Reading Strategies – Skimming, Scanning, Intensive and Extensive Reading – Manuals, Standards Documents and Academic Articles — Technical Word Families – Prefixes and Suffixes in Engineering Terminology – Collocations in Engineering Discourse – Inferring Meaning from Context-Note-making, Summarising and Paraphrasing Technical Content.

Lab Activity: Listening files and Note-taking

Module 2:

Grammar & Technical Writing Skills:

Grammar for Technical Writing – Subject-Verb Agreement in Technical Contexts – Tense Consistency in Reports- Report Writing - Voices (Active and passive).–Topic Sentences - Transition Signals and Process Description– Instructions and Operating Procedures – Interpreting Diagrams, Charts and Graphs.

Lab Activity:SVA Exercise, Picture Description Activity

Module 3:

Professional & Technical Workplace Communication:

Formal Letters – Permission- Bona fide-Business Letters–Formats – Letters of Inquiry, Complaint, and Recommendation –Minutes of Meetings and Notices – Agenda Preparation – Recording and Circulating Minutes – Action Items and Follow-up Communication.

Lab Activity: Listening to Audio files & Preparing Minutes

Module 4:

Oral Communication & Interpersonal Skills:

Question Forms and Question Tags- Spotting Errors-Types of Sentences- Oral Presentation Skills – Planning and Structuring a Technical Presentation – Designing Effective Slides (visual clarity, data display) – Verbal and Non-verbal Communication – Handling Q&A Sessions.

Lab Activity: Digital Presentation, Spotting Errors

Module 5:

Career Communication and Digital Professionalism:

Social Media and Workplace Digital Communication – Professional Use of Platforms – Netiquette – Data Privacy and Ethical Communication Practices – Environmental and SDG-aligned Communication- Jumbled Sentences.

Lab Activity: Presentation on SDG topics, Jumbled Sentences

Text Book

1. **Sanjay Kumar and Pushplata,** "Communication Skills", 3rd Edition, Oxford University Press, 2021.
2. **M. Ashraf Rizvi,** "Effective Technical Communication", 2nd Edition, McGraw-Hill Education India, 2018.

3. **John M. Lannon and Laura J. Gurak,** "Technical Communication", 15th Edition, Pearson Education, 2020.

Reference Books& web resources

- Michael Markel and Stuart A. Selber, "Technical Communication", 12th Edition, Bedford/St. Martin's, 2018.
- Sharon J. Gerson and Steven M. Gerson, "Technical Writing: Process and Product", 8th Edition, Pearson, 2017.
- Adrian Wallwork, "English for Writing Research Papers", 2nd Edition, Springer, 2016.
- AICTE Examination Reform Policy, November 2018 – https://www.aicte-india.org
- MIT OpenCourseWare – Technical Writing (21W.035): https://ocw.mit.edu
- NPTEL – Communication Skills (IIT Kharagpur): https://nptel.ac.in

SDG Alignment

SDGs Addressed:

SDG 4: Quality Education – Enhances technical communication, academic literacy, grammar, presentation, and professional language skills for effective learning and lifelong education.

SDG 8: Decent Work and Economic Growth – Develops workplace communication, technical writing, employability, interview, and career readiness skills required for professional environments.

SDG 9: Industry, Innovation and Infrastructure – Strengthens technical documentation, innovation reporting, digital professionalism, and presentation skills relevant to engineering and technology sectors.

Activities Aligned with SDGs:

SDG 4: Technical reading, summarizing, grammar activities, listening and note-taking exercises, and oral presentation practice.

SDG 8: Business letter writing, professional email communication, resume preparation, mock interviews, and workplace communication activities.

SDG 9: Technical report writing, diagram interpretation, presentations on emerging technologies, AI, renewable energy, and digital communication practices.

Course Contents and Lecture Schedule: 24 hours

S.No	Topic	No. of Hours
1.	Technical Word Families, Prefixes/Suffixes, Collocations & Contextual Meanings	1
2.	Reading Strategies (Skimming/Scanning) for Manuals, Standards & Articles	1
3.	Intensive & Extensive Reading of Technical Content	1
4.	Inferring Meaning from Context	1
5.	Note-making, Summarising, and Paraphrasing Technical Content	1
6.	Grammar for Technical Writing – Subject-Verb Agreement	1
7.	Tense Consistency in Technical Reports	1
8.	Active and Passive Voice in Technical Writing	1
9.	Topic Sentences & Transition Signals in Reports	1
10.	Process Description, Instructions & Interpreting Diagrams/Charts	1
11.	Formal Letters – Permission, Bona fide, Business Letters	1

12.	Letters of Inquiry, Complaint, and Recommendation	1
13.	Minutes of Meetings – Agenda Preparation & Recording	1
14.	Circulating Minutes, Action Items & Follow-up Communication	1
15.	Question Forms, Question Tags, and Spotting Errors	1
16.	Types of Sentences & Effective Oral Communication	1
17.	Planning and Structuring a Technical Presentation	1
18.	Designing Slides (Visual Clarity & Data Display)	1
19.	Verbal/Non-verbal Communication & Handling Q&A Sessions	1
20.	Social Media and Workplace Digital Communication	1
21.	Professional Use of Platforms & Netiquette	1
22.	Data Privacy and Ethical Communication Practices	1
23.	Environmental & SDG-aligned Communication	1
24.	Jumbled Sentences for Technical Clarity	1
Total		**24**

Course Contents and Lab Schedule: 16 hours

S.No	Topic	No. of Hours
1.	Listening to Technical Audio Files	1
2.	Note-taking from Audio Content	2
3.	Subject-Verb Agreement (SVA) Exercises	1
4.	Picture Description Activity	2
5.	Listening to Audio Files (Meetings/Discussions)	1
6.	Preparing Minutes of Meetings	1
7.	Digital Presentation	2
8.	Spotting Errors Activity	1
9.	Presentation on SDG Topics	2
10.	Jumbled Sentences Activity	1
11.	Practical / Lab Model Test	2
Total		**16**

Lab Assessment (Model Test)

S.No	Assessment Activity	Skills Assessed	Percentage (%)
1.	Listening to Technical Audio	Listening comprehension	25%
2.	Spotting Errors & Jumbled Sentences	Grammar accuracy, coherence, sentence organization	25%
3.	Picture Description	Vocabulary, technical description, fluency	20%
4.	Viva Voce	Communication skill, confidence, response to question	30%

Course Designer(s):

1. Dr.S.Subash Assistant Professor, Department of English | ssheng@tce.edu
2. Dr.M.Arjunan, Assistant Professor, Department of English | maeng@tce.edu

26MEEA0	ENGINEERING GRAPHICS

L	T	P	Credit	Category
1	-	4	3	TCP-P

(Common to Mechanical Engg, Civil Engg, EEE, E& CS branches)

Preamble

Engineering Graphics is referred as language of engineers. An engineer needs to understand the geometry of any object through its orthographic or pictorial projections. The knowledge on engineering graphics is essential in proposing new product designs through drawings and in reading or understanding the existing drawings.

Prerequisite

- Nil

Course Outcomes

On the successful completion of the course, students will be able to

No.	Course Outcome	TCE Proficiency Scale	Performance Indicator	CO Weightage	SDG Addressed	SDG Level
CO1	Draw the orthographic views of objects from the given isometric views	TPS3	1.4.1	14%	SDG 9: Industry, Innovation, & Infrastructure	Level 1 (Introductory)
CO2	Draw the orthographic projections of straight lines inclined to both reference planes.	TPS3	1.4.1	14%	SDG 9: Industry, Innovation, & Infrastructure	Level 1 (Introductory)
CO3	Draw the orthographic projections of plane surfaces inclined to one reference planes.	TPS3	1.4.1	14%	SDG 9: Industry, Innovation, & Infrastructure	Level 1 (Introductory)
CO4	Draw the orthographic projections regular solids with axis inclined to any one-reference plane.	TPS3	1.4.2	14%	SDG 9: Industry, Innovation, & Infrastructure	Level 2 (Intermediate)
CO5	Draw the orthographic projection and its development of sectioned solids and true shape of the sections.	TPS3	1.4.2	14%	SDG 9: Industry, Innovation, & Infrastructure	Level 2 (Intermediate)
CO6	Develop computer-aided 2D models for the given drawing with appropriate dimensioning using CAD package (Continuous Assessment only).	TPS3	5.1.1	15%	SDG 4: Quality Education SDG 9: Industry, Innovation, & Infrastructure	Level 2 (Intermediate)
CO7	Develop computer-aided 3D models for the given drawing with appropriate dimensioning using CAD package (Continuous Assessment only).	TPS3	5.2.1	15%	SDG 4: Quality Education SDG 9: Industry, Innovation, & Infrastructure	Level 2 (Intermediate)

Assessment Pattern

CO	Practical	Theory	Terminal Exam*
	OCR/Continuous Assessment	Model Test CO-wise	
	% of Marks	% of Marks	% of Marks
CO1	14	15	15
CO2	14	15	15
CO3	14	20	20
CO4	14	25	25
CO5	14	25	25
CO6	15	-	
CO7	15	-	
Total	100	100	100

***Note:** **Terminal Practical Examination will be conducted by Mechanical Department and will be evaluated by two internal examiners. Duration of the examination is 3 hours.**

Assessment Pattern: Practical Component

Type of Assessment	Component	Marks	Remarks
Continuous Assessment	Pre-lab, In-lab, Post-lab	75	Conducted throughout the semester
Model Test	CO-wise(Cognitive, Psychomotor, Affective)	25	Rubrics covering all Domains of learning
Total Internal Marks		**100**	
End Semester Examination	CO-wise(Cognitive, Psychomotor, Affective)	100	Rubrics covering all Domains of learning

Syllabus

Module 1: Principle of Orthographic Projection
Drawing instruments, Drawing standards (BIS), Lettering in engineering, Sheet layout, elements of dimensioning, Systems of dimensioning-Orthographic Projection – Principles of first angle projection – Conversion of isometric views to orthographic views – Selection of front view – Top view and side views – Conventional representation of standard features.

Module 2: Projections of Straight Lines
Projections of Lines – Line inclined to one plane and parallel to the other – Line inclined to both the reference planes (HP and VP) – True length and true inclinations of a line – Rotating line method.

Module 3: Projections of Plane Surfaces
Projections of Planes – Surface inclination to one reference plane – Projection of regular polygonal planes (triangle, square, rectangle, pentagon, hexagon) – Projection of circular planes.

Module 4: Projections of Regular Solids
Projections of Solids – Classification of solids (prisms, pyramids, cylinders, cones) – Axis inclined to one reference plane and parallel to the other – Axis inclined to one reference plane and perpendicular to the other – Turning/change of position method.

Module 5: Section of Solids and Development of Surfaces

Sectioned Solids & Surface Development – Section planes perpendicular to one plane and inclined to another – True shape of a section – Development of lateral surfaces of regular and sectioned solids – Parallel line development – Radial line development.

Module 6: Computer-Aided 2D Drafting

Introduction to CAD Package – 2D Commands and interface. Orthographic & Isometric Projection: Introduction. Setting up Units, Limits, and basic Layers (Object, Hidden, Dimension). Coordinate entry systems: Absolute and Relative Polar. Core Drawing Commands: LINE, CIRCLE, RECTANG, POLYGON. Essential Modify Commands: MOVE, COPY, ROTATE, TRIM, MIRROR, FILLET. Functional Annotation: Basic Linear and Radius dimensioning.

Module 7: Computer-Aided 3D Modelling

Introduction to CAD Package – 3D Commands and interface. 3D Navigation: Workspace switching, User Coordinate System (UCS), ViewCube, and Visual Styles. Solid Primitives: BOX, CYLINDER. Creating 3D Solids from 2D profiles: EXTRUDE, PRESSPULL. Boolean Operations: UNION, SUBTRACT. Model Layout:Preparing standard drawing sheets to display finished solid components.

Text Book

1. N. D. Bhatt, “Engineering Drawing”, Charotar Publishing house Pvt. Ltd, Anand, 2025.

Reference Books & web resources

1. Natarajan K.V., “A text book of Engineering Graphics”, Dhanalakshmi Publishers, Chennai,
2. 2012.
3. Basant Agarwal and Agarwal C.M., “Engineering Drawing”, Tata McGraw Hill Publishing Company Limited, New Delhi, 2019.
4. Venugopal K. and Prabhu Raja V., “Engineering Graphics”, New Age International (P) Limited, 2011.
5. Gopalakrishna K.R., “Engineering Drawing” (Vol. I&II combined), Subhas Publications, Bangalore, 2017.
6. Shah M.B, and Rana B.C (2009) “Engineering Drawing and Computer Graphics”, Pearson Education.
7. CAD Software Theory and User Manuals.

SDG Alignment

Activities aligned with SDGs addressed:

1. **SDG 9: Industry, Innovation, and Infrastructure**
   Training students in industry-standard 2D drafting and 3D modelling tools (like AutoCAD) to develop technical skills required for modern engineering design, digital manufacturing, and infrastructural innovation.
2. **SDG 4: Quality Education**
   Providing relevant technical and vocational skills for employment, decent jobs, and entrepreneurship by equipping students with advanced computer-aided design capabilities aligned with global engineering standards.

Course Contents and Lecture Schedule

Module No	Topics	No of Periods		Course outcomes
		Lecture	Practice	
1	**Principle of Orthographic Projection**	**1**	**5**	
1.1	Principles of Orthographic Projection & First Angle Projection conventions	1	1	CO1

1.2	Selection of front view, top view, and side views for components		1	CO1
1.3	Conversion of Isometric views to Orthographic views		2	CO1
1.4	Conventional representation of standard features		1	CO1
2	**Projections of Straight Lines**	**1**	**9**	
2.1	Introduction to Projections of Lines: Parallel to one or both planes	0.5	1	CO2
2.2	Line inclined to one reference plane and parallel to the other (HP and VP problems)		2	CO2
2.3	Line inclined to both reference planes (HP and VP) – Introduction to apparent lengths	0.5	2	CO2
2.4	Finding True Length (TL) and True Inclinations using the Rotating Line Method		2	CO2
2.5	Advanced practice problems on lines inclined to both planes		2	CO2
3	**Projections of Plane Surfaces**	**2**	**9**	
3.1	Introduction to Projections of Planes & Surface inclination to one reference plane	0.5	2	CO3
3.2	Projection of regular polygonal planes: Triangle and Square	0.5	2	CO3
3.3	Projection of regular polygonal planes: Rectangle and Pentagon	0	2	CO3
3.4	Projection of Hexagonal planes with different orientation conditions	0	2	CO3
3.5	Projection of Circular planes (inclined to HP/VP)	1	1	CO3
4	**Projections of Regular Solids**	**2**	**8**	
4.1	Classification of regular solids (Prisms, Pyramids, Cylinders, Cones) & basic projections	0.5	2	CO4
4.2	Solids with axis inclined to one reference plane and parallel to the other	0.5	2	CO4
4.3	Solids with axis inclined to one reference plane and perpendicular to the other	0	2	CO4
4.4	Solving solids projection using the Turning / Change of Position Method	1	2	CO4
5	**Section of Solids and Development of Surfaces**	**2**	**9**	
5.1	Introduction to Section of Solids: Section planes perpendicular to one plane and inclined to another	0.5	1	CO5
5.2	Determining and drawing the True Shape of a section (Prisms/Pyramids)	0.5	2	CO5
5.3	Concept of Development of Lateral Surfaces & Parallel Line Development (Prisms & Cylinders)	0.5	2	CO5
5.4	Radial Line Development method for Pyramids and Cones	0.5	2	CO5
5.5	Development of lateral surfaces of sectioned/cut solids		2	CO5
6	**Computer-Aided 2D Drafting**	**2**	**4**	
6.1	Introduction to CAD Package – 2D Commands and interface. Orthographic & Isometric Projection: Introduction.	1	1	CO6
6.2	Setting up Units, Limits, and basic Layers (Object, Hidden, Dimension). Coordinate entry systems: Absolute and Relative Polar.		1	CO6
6.3	Core Drawing Commands: LINE, CIRCLE, RECTANG, POLYGON.	1	1	CO6

6.4	Essential Modify Commands: MOVE, COPY, ROTATE, TRIM, MIRROR, FILLET. Functional Annotation: Basic Linear and Radius dimensioning.		1	CO6
7	**Computer-Aided 3D Modelling**	**2**	**4**	
7.1	Introduction to CAD Package – 3D Commands and interface. 3D Navigation: Workspace switching, User Coordinate System (UCS), View Cube, and Visual Styles.	1	1	CO7
7.2	Solid Primitives: BOX, CYLINDER.		1	CO7
7.3	Creating 3D Solids from 2D profiles: EXTRUDE, PRESSPULL.	1	1	CO7
7.4	Boolean Operations: UNION, SUBTRACT. Model Layout: Preparing standard drawing sheets to display finished solid components.		1	CO7
	Total Periods	**12**	**48**	

List of Exercises with CO Mapping

Sl. No.	Name of the Exercise	Level of Execise	Objective(s)	COs Addressed
1	Introduction to CAD Environment and Coordinate Systems	Level 1	**Psychomotor Skills:** Demonstrate procedural proficiency in operating CAD software interfaces and navigating coordinate systems.	C06
2	Workspace Setting and Drawing Initialization	Level 2	**Psychomotor Skills, Models:** Demonstrate manual dexterity in configuring software workspaces and connecting theoretical layout standards to digital environments.	C06
3	2D Geometric Profile Construction	Level 2	**Design, Psychomotor Skills:** Design and construct systematic 2D geometric shapes with precise dimensional controls and documentation.	C06
4	Modification and Functional Annotation of 2D Layouts	Level 2	**Design, Communication:** Apply modification tools to 2D engineering systems and communicate experimental design findings through precise professional annotations.	C06
5	Navigation and Modeling of Solid Primitives in 3D Space	Level 1	**Psychomotor Skills:** Demonstrate manual dexterity and procedural proficiency in operating 3D workspace tools and generating basic solid primitives.	C07
6	Generative 3D Modeling from 2D Profiles	Level 2	**Models, Design:** Connect theoretical 2D profile models to real-world 3D experimental behavior; design and build complex engineering parts.	C07
7	Volumetric Editing and Final Model Layout Sheet Setup	Level 2	**Design, Communication:** Test engineering systems using iterative design validation; communicate final experimental findings effectively via professional written/graphical sheet layouts.	CO7

Course Designer(s):

1.	Dr. B. Karthikeyan	Assistant Professor	Mechanical Engineering	bkmech@tce.edu
2.	Dr. M. Balamurali	Associate Professor	Mechanical Engineering	balacim82@tce.edu
3.	Mr. T. Prakash	Assistant Professor	Mechanical Engineering	tpmech@tce.edu
4.	Dr. C. Selva Kumar	Assistant Professor	Mechanical Engineering	cskmech@tce.edu
5.	Dr. R. Kamalakannan	Assistant Professor	Mechanical Engineering	rkkmech@tce.edu

26CCEA0	INTRODUCTION TO ENGINEERING	Category	L	T	P	Credits	TE type
		ESC	1	0	2	2	TCP-P

1. Preamble

This course introduces first-year engineering students to the engineering profession, fundamental measurement techniques, and the design of simple functional systems. Through hands-on activities such as product teardown, instrument-based measurements, 3D modelling using TinkerCAD, data analysis with Excel, and team-based projects, students develop essential technical and professional skills. The course follows the CDIO (Conceive–Design–Implement–Operate) framework, fostering engineering thinking from the first semester. It also promotes awareness of engineering ethics, safety, sustainability, and the role of engineering in addressing societal challenges and the UN Sustainable Development Goals.

2. Prerequisite

Nil

3. Course Outcomes

On the successful completion of the course, students will be able to:

No.	Course Outcome	TCE Proficiency Scale	Performance Indicator	CO Weightage	SDG Addressed	SDG Level
CO1	Describe the engineering profession, major engineering disciplines, and the CDIO framework for product and system lifecycle.	TPS 2	1.1.1	15%	SDG 4	1
CO2	Decompose a product or engineering system into its functional components, sub-systems, and operational constraints using structured analysis.	TPS 3	1.2.1	20%	SDG 9	2
CO3	Apply data acquisition systems and computational tools (Excel / Python) to acquire, process, and interpret sensor data with appropriate uncertainty analysis.	TPS 3	5.2.1	20%	SDG 9	2
CO4	Implement and validate a simple engineering artefact/system by applying basic	TPS 3	4.4.1	20%	SDG 9	2

	engineering principles, tools, and teamwork.					
CO5	Demonstrate professional teamwork and technical communication competencies through a structured engineering report and oral presentation.	TPS 3	8.2.1	15%	SDG 4	2
CO6	Evaluate engineering solutions against criteria of professional ethics, occupational safety, and sustainable development, with reference to relevant SDGs.	TPS 4	7.2.1	10%	SDG 12, SDG 13	3

4. Assessment Pattern

CO	Theory		Practical		Terminal Exam (Practical)
	CAT1	CAT2	OCR/Continuous Assessment	Model Test CO-wise	
	% of Marks	% of Marks	% of Marks	% of Marks	% of Marks
CO1		**25**	**100**	**100**	100
CO2		**35**			
CO3		**30**			
CO4		**10**			
CO5					
CO6					
Total	-	100	100	100	100

5. Assessment Pattern: Practical Component

Type of Assessment	Component	Marks	Remarks
Continuous Assessment	Pre-lab, In-lab, Post-lab	75	Conducted throughout the semester
Model Test	CO-wise (Cognitive, Psychomotor, Affective)	25	Rubrics covering all Domains of learning
Total Internal Marks		**100**	
End Semester Examination	CO-wise (Cognitive, Psychomotor, Affective)	100	Rubrics covering all Domains of learning

6. Syllabus

Module 1: Engineering Around Us

What is engineering? – Major engineering disciplines – Engineering in everyday life – Engineering and society – Creativity and innovation – Engineering products and systems – Product observation and teardown activity.

Module 2: Engineering Measurements and Tools

SI units and engineering measurements – Measurement of dimensions and physical quantities using basic measuring instruments – Data recording – Accuracy, precision, and errors – Engineering estimation and reasoning – Safe use of engineering tools and instruments.

Module 3: Engineering Visualization and Simulation

Introduction to engineering drawings and visualization – Basic 2D and 3D concepts – Excel for tables and graph plotting – Introduction to ThinkerCAD – Simple 3D object creation – Basic circuit simulation.

Module 4: Engineering Making

Introduction to engineering materials – Basic fabrication techniques: cutting, joining, and assembling – Workshop safety practices – Introduction to sensors and automation concepts – Team-based engineering activity – Building a simple functional model.

Module 5: Teamwork, Ethics and Sustainability

Teamwork and collaboration – Basics of technical presentations – Engineering ethics and responsibilities – Engineering safety – Sustainability and SDGs in engineering – Engineering solutions for society.

7. Learning Resources

7.1 Text Books

1. Crawley, E., Malmqvist, J., Ostlund, S., Brodeur, D., "Rethinking Engineering Education: The CDIO Approach", Springer, 2014.
2. Eide, A., Jenison, R., Mashaw, L., Northup, L., "Introduction to Engineering Design and Problem Solving", McGraw-Hill, 3rd Edition.

7.2 Reference Books & Web Resources

1. CDIO Syllabus v3.0, Worldwide CDIO Initiative -- www.cdio.org (free download).
2. MIT Open Course Ware 2.00A: Introduction to Design -- ocw.mit.edu.
3. Python for Engineers: Google Colab notebooks (free, requires internet).
4. IEEE Engineering Ethics Resources -- www.ieee.org/ethics.

8. Course Contents and Lecture Schedule

Module No	Topics	No of Periods	**Course Outcomes**
	Module 1:		
1.1	What is engineering? – Major engineering disciplines – Engineering in everyday life	2	CO1
1.2	Engineering and society – Creativity and innovation	1	CO1
1.3	Engineering products and systems – Product observation and teardown activity	1	CO1, CO2
2.1	SI units and engineering measurements – Measurement of physical quantities using basic instruments	1	CO3
2.2	Data recording – Accuracy, precision, and errors – Engineering estimation and reasoning	1	CO3

2.3	Safe use of engineering tools and instruments	1	CO3, CO6
3.1	Introduction to engineering drawings and visualization – Basic 2D and 3D concepts	1	CO2
3.2	Excel for tables and graph plotting – TinkerCAD: 3D object creation and basic circuit simulation	1	CO2, CO3
4.1	Introduction to engineering materials – Fabrication techniques: cutting, joining, assembling – Workshop safety	1	CO4, CO6
4.2	Sensors and automation concepts – Team-based engineering activity – Building a simple functional model	2	CO4
5.1	Teamwork and collaboration – Basics of technical presentations	1	CO5
5.2	Engineering ethics and responsibilities – Engineering safety	1	CO5, CO6
5.3	Sustainability and SDGs in engineering – Engineering solutions for society	1	CO5, CO6
Total (Hrs)		15	

9. List of Experiments with CO Mapping

Sl. No.	Name of the Experiment	Level of Experiment	Objective(s)	COs Addressed
1.	Product Teardown and Functional Analysis	Level 1	Obj. 3 – Experimentation	CO1, CO2, CO6
2.	Product Teardown and Design Improvement	Level 2	Obj. 5 – Design	CO1, CO2, CO4, CO6
3.	Measurement of Dimensions and Physical Quantities Using Basic Engineering Instruments.	Level 1	Obj. 1 – Instrumentation	CO3, CO6
4.	Design and Visualization of Basic 3D Geometric Objects Using TinkerCAD	Level 1	Obj. 5 – Design	CO2, CO3
5.	Design and Simulation of a Basic Electrical Circuit Using TinkerCAD	Level 2	Obj. 3 – Experimentation	CO2, CO3, CO4
6.	Data Tabulation and Graph Plotting Using Microsoft Excel	Level 1	Obj. 4 – Data Analysis	CO3
7.	Micro Project	Level 3	Obj. 5 – Design	CO2, CO4, CO5
8.	Case Study – Engineering Ethics and Responsibility	Level 2	Obj. 13 – Ethics & Integrity	CO5, CO6
9.	Technical Report Writing	Level 1	Obj. 11 – Communication	CO5

10. Course Designer(s):

- Dr. S. Baskar, Professor, EEE, and Dean (A&A), sbeee@tce.edu
- Dr. R. Rajan Prakash, Associate Professor, EEE, r_rajanprakash@tce.edu
- Dr. V. Balasubramian, Associate Professor, Mechanical, vbmech@tce.edu

26FTCA0	EVOLUTION OF FASHION DESIGN	Category	L	T	P	Credit
		PCC	3	0	2	4

Preamble

The course explores the evolution of global and Indian fashion traditions, examining historical costumes, textiles, and embellishment techniques that continue to inspire contemporary design practices. By connecting heritage knowledge with modern fashion innovation, and cultural preservation, the course establishes a strong foundation for creative and industry-relevant fashion development.

Prerequisite

nil

Course Outcomes

After the successful completion of the course, students will be able to:

No.	Course Outcome	TPS Level	Performance Indicator	CO Weightage	SDG addressed	SDG Level
CO1	Explain the **evolution of fashion**, garments, and textiles across **major global civilizations and historical periods.**	TPS2	1.4.1	15	SDG 4	1
CO2	Interpret the characteristics of **historical Indian costumes**, **royal attire, and dressing practices** in relation to their cultural and social significance.	TPS2	6.1.1	15	SDG 11	2
CO3	Analyse **regional Indian costumes**, draping styles, and traditional accessories.	TPS3	2.2.2	18	SDG 4	1
CO4	Apply knowledge of **traditional Indian textiles and embellishment techniques** to classify their design features and applications.	TPS3	3.2.2	19	SDG 12	2
CO5	Analyze the **influence of historical costumes and traditional textiles** on **contemporary fashion products and design practices.**	TPS4	3.4.1	18	SDG 9	2
CO6	Demonstrate appreciation for **cultural diversity and textile heritage** through **collaborative documentation and presentation** of traditional costume traditions.	TPS3	9.2.1	15	SDG 11	2

Syllabus

Historical Development of Global Fashion - Origin and evolution of fashion design, Principle garments and textiles from: Egyptian civilization, Greek and Roman eras, Medieval English period, Renaissance French fashion - Influence of historical fashion on contemporary design

Indian Historical Costumes - Ancient Indian garments during Mauryan and Gupta periods, Evolution of draping and tailoring in Indian civilization, Symbolism and material use in Indian royal attire, Socio-cultural influence on costume evolution

Traditional Indian Costumes – Regional Focus-I - Tamil Nadu, Kerala, Gujarat, Rajasthan, Cultural background and symbolic elements, Draping styles, accessories, and gender-specific differences.
Regional Focus-II - Bengal, Orissa, Manipur, Jammu & Kashmir, Maharashtra - Design characteristics, fabrics used, and ceremonial importance - Distinctive features and preservation of costume traditions.

Traditional Indian Textiles & Embellishments - Hand-Woven Textiles: Banaras Brocades, Jamdani, Paithani, Kanchipuram, Chanderi - Printed Textiles: Bagru, Kalamkari
Embroidered Textiles: Kashida, Phulkari, Chamba Rumal, Chikankari, Zardozi, Kasuti, Kantha Resist-Dyed Textiles: Bandhani, Lehariya, Ikat, Patola

Learning Resources

Text Book

1. Auguste Racinet, *The Costume History*, Taschen Publications, 2017.
2. Parul Bhatnagar, *Traditional Indian Costumes and Textiles*, Abhishek Publications, Chandigarh, 2004.

Reference Books & Web resources

1. Tortora, P.G. and Eubank, K., *Survey of Historic Costume: A History of Western Dress*, 7th Edition, Fairchild Books, New York, 2021.
2. John Peacock, *The Chronicle of Western Costume*, Thames & Hudson, London, 1991.
3. Rita J. Kapur Chishti, *Saris: Tradition and Beyond*, Roli Books, New Delhi, 2010.
4. Rta Kapur Chishti and Martand Singh, *Saris of India: Tradition and Beyond*, Wiley India, 2010.
5. Ritu Kumar, *Costumes and Textiles of Royal India*, Christie's Books, 1999.
6. Eberle, H., Hermelingmeier, A., Hornberger, M., Kilgus, R., Menzer, G. and Ring, W., *Clothing Technology*, Europa-Lehrmittel, Germany, 2018.
7. Jasleen Dhamija, *Indian Folk Arts and Crafts*, National Book Trust, New Delhi, 2017.