F.E. / F.T.

SEM – I

(A.Y. 2024-25)

B.E. (COMP/ CIVIL / E&CS / CSE) / B.Tech. (IoT/ AI&DS)

F./F.T. Semester –I
Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education - (CBCGS-HME 2023)
TCET Autonomy Scheme (w.e.f. A.Y. 2024-25)

<table>
<tr><td colspan="9">B.E. (COMP/ CIVIL / E&CS / CSE) / B.Tech. (IoT/ AI&DS)</td><td colspan="3">F.E./F.T. (SEM: I)</td></tr>
<tr><td colspan="9">Course Name: Physics</td><td colspan="3">Course Code: BSC1101</td></tr>
<tr><td colspan="5">Teaching Scheme (Program Specific)</td><td colspan="7">Examination Scheme (Formative/ Summative)</td></tr>
<tr><td colspan="5">Modes of Teaching / Learning / Weightage</td><td colspan="7">Modes of Continuous Assessment / Evaluation</td></tr>
<tr><td colspan="5" rowspan="2">Hours Per Week</td><td colspan="3" rowspan="2">Theory (100)</td><td rowspan="2">Practical/ Oral (25)</td><td rowspan="2">Term Work (25)</td><td rowspan="2">Total</td></tr>
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<tr><td colspan="10">Prerequisite: 10+2 level of Science knowledge related to crystalline solids, Semiconductors, Modern Physics, Wave theory of light, Magnetism</td></tr>
</table>

Course Objective: The course intends to impart fundamental concepts and principles of crystallography, semiconductor, quantum mechanics, lasers and smart materials which can solve the engineering problems.

Course Outcomes: Upon completion of the course students will be able to:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Analyze Fermi Dirac Distribution function to semiconductor and variation of Fermi level with temperature, impurity concentration,	L1, L2, L3
2	Understand the principles of quantum mechanics and its key.	L1, L2, L3
3	Understand the concept of Sensors, its types and applications	L1, L2, L3
4	Understand the Interference of light and its applications, Optical fibres, its types and applications	L1, L2, L3
5	Understand different types of LASERs with their various applications	L1, L2, L3

6	Understand Nanotechnology, synthesis methods, tools used for nanomaterials, Nanotubes and its applications	L1, L2, L3

Detailed Syllabus (Total No. of Hours: 45):

Module No.	Topics	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Semiconductors** Intrinsic and extrinsic semiconductors, Fermi Dirac distribution function, Dependence of Fermi level on carrier-concentration, and temperature, Hall effect and its applications, Resistivity, conductivity and mobility, E_K Diagram and its significance, Direct and Indirect Bandgap Semiconductors, Semiconductor photodetectors, PN and PIN Photodiode -Structure, materials, working principle, and characteristics	8	L1, L2, L3.
2	**Quantum Mechanics** De-Broglie hypothesis, Heisenberg's uncertainty principle, Applications of uncertainty principle (Absence of electron inside Nucleus), wave packet, Wave function, Physical interpretation of wave function; Time Dependent Schrodinger's Equation (TDSE), Time Independent Equation (TISE), Application of TISE. Particle in box and Potential well	8	L1, L2, L3.
3	**Sensors** Basic concept of Sensors and various parts of Sensors, Types of Sensors, Temperature Sensor, Proximity Sensor, IR Sensor (Infrared Sensor), Pressure Sensor, Optical Sensor, Piezoelectric effect, Piezoelectric oscillator for production of ultrasonic waves, Ultrasonic Sensor and its two applications	6	L1, L2, L3.

4	**Wave Optics and Optical Fibers** Interference of light by amplitude splitting, Thin film, Wedge shaped film, Newton's rings, Interference applications. Fibre optics: Introduction, total internal reflection, basic construction and types of optical fibre; Numerical Aperture, Angle of acceptance, V-number, Maximum number of possible orders; Losses in optical fibre; Optical Fibre Communication system model, Applications & future trends	9	L1, L2, L3
5	**Lasers** Interaction of Photons with matter- Absorption, Spontaneous Emission, Stimulated Emission, Pumping, Population Inversion, Active Medium, Different types of lasers: gas lasers (He-Ne), Solid state lasers- Nd-YAG Lasers, Semiconductor diode lasers; Properties and industrial applications of laser beams, Holography	7	L1, L2, L3
6	**Introduction to nanoscience and nanotechnology** Top-Down Approach - Mechanical Grinding, Plasma Arching, Electrodeposition. Bottom-Up Approach – Sol Gel, CVD, Solvothermal/ Hydrothermal method SEM, STEM, AFM. Properties and Applications of nanomaterials; Different forms of carbon nanomaterials, carbon nanotubes, properties and applications. Emerging trends in Nanotechnology – Nano fabrics, Nanodevices, Nanoencapsulation and Nanofilters	7	L1, L2, L3

Suggested List of Practical/ Experiments:

Practical Number	Type of Experiment	Practical/ Experiment Topic	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Basic Experiments**	Study of I-V Characteristics of LED and Calculate Planck's Constant	2	L1, L2, L3, L4
2		Determination of energy band gap of a semiconductor using Four Probe Method	2	L1, L2, L3
3		Determination of Hall Coefficient of semiconductor material using Hall Effect phenomenon.	2	L1, L2, L3
4		A) Study I-V Characteristics of Photodiode B) Numerical Aperture of Optical Fibre	2	L1, L2, L3, L4
5	**Advanced Experiments**	A) Introduction to Wedge shaped film and Newton's Ring Experiment B) Allotment of Design Experiment as Tenth Experiment	2	L1, L2, L3, L4
6		Determination of fringe width using Wedge shaped film	2	L1, L2, L3
7		Determination of radius of curvature of Plano Convex lens using Newton's Rings.	2	L1, L2, L3
8	**Basic Experiment**	Determination of unknown wavelength of laser using diffraction grating.	2	L1, L2, L3
9		A) Ultrasonic Distance Meter B) Monitoring of Design Experiment	2	L1, L2, L3
10	**Project Based Experiments-**	complete any one Project Based experiment from the list or any other project in discussion with Faculty		L1, L2, L3, L6

		in- Charge) Submission of Design Experiment	6	
11	Repetition	Repetition of all experiments	2	L1, L2, L3
Total			**26**	

Books and References:

SN	Title	Authors	Publisher	Edition	Year
1	Engineering Physics	Bhattacharya D K and Tandon	New Delhi, Oxford Press	1st	2015
2	A textbook of Engineering Physics.	Kshirsagar M. N. and Avadhanulu P.G.	S.Chand	12th	2018
3	Engineering Physics	Malik H K, Singh A K	Mac-Graw Hill	2nd	2018
4	Lasers: Fundamentals and Applications	Ghatak and Thyagarajan	Springer	2nd	2011
5	Quantum Physics of Atoms, Molecules and Solids	Robert Eisberg& Robert Resnick	Wiley Publications.	2nd	2006
6	Semiconductor Optoelectronics: Physics and Technology	J. Singh	McGraw-Hill		1995
7	Semiconductor Devices: Physics and Technology.	S. M. Sze	Wiley	Student Edition.	2016
8	An Introduction to Sensors and Instrumentation	Shobhnath Singh	Alpha Science International	-	2020
9	Fibre Optic Communication by Govind Rai	Govind Rai	Wiley	3rd Edition	2015
10	Nanomaterial: An introduction to properties, Synthesis and Applications	Emmanual Craig	Larsen & Kellar Education	1st Edition	2019

F.E./F.T. Semester –I

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education - (CBCGS-HME 2023)

TCET Autonomy Scheme (w.e.f. A.Y. 2024-25)

B.E./B.Tech. (All Branches)								**F.E./F.T. (SEM: I)**		
Course Name: Mathematics-I								**Course Code:** BSC1102		
Teaching Scheme (Program Specific)					**Examination Scheme (Formative/ Summative)**					
Modes of Teaching / Learning / Weightage					**Modes of Continuous Assessment / Evaluation**					
Hours Per Week					**Theory (100)**			**Practical/Oral (00)**	**Term Work (25)**	**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**ISE**	**IE**	**ESE**	**PR**	**TW**	
4	1	-	5	5	20	20	60	-	25	**125**
ISE: In-Semester Examination - Paper Duration – 1 Hour **IE: Innovative Examination**										
ESE: End Semester Examination - Paper Duration - 2 Hours										
The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)										
Prerequisite: 10+2 level Mathematics										

Course Objective: The Course intends to develop the basic Mathematical skills of engineering students that are imperative for effective understanding of engineering subjects. The topics introduced will serve as basic tools for specialized studies in many fields of engineering and technology.

Course Outcomes: Upon completion of the course students will be able to:

SN	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Apply the fundamentals of calculus and concepts of sequence-series.	L1, L2
2	Apply the concept of partial derivatives in its application part.	L1, L2, L3
3	Apply the concepts of complex numbers.	L1, L2, L3
4	Evaluate the rank of a matrix and its application to solve the system of equations.	L1

5	Apply the concept of Gamma and Beta function to evaluate the area and volume	L1, L2, L3
6	Inculcate the integration technique by various methods.	L1, L2, L3

Detailed Syllabus (Total No. of Hours: 60)

Module No.	Topics	Lectures	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Calculus-I** (Pre-requisite: Limits, Continuity, Differentiability, Sequence & Series) Mean value theorems (Rolle's, Lagrange's and Cauchy's Theorem), Taylor's series, Maclaurin series for exponential, trigonometric and logarithm functions, Indeterminate forms, Convergence of sequence and series, D'Alembert's ratio test, Cauchy's nth root test and Cauchy's Integral test.	10	L1, L2
2	**Multivariable Calculus (Differentiation)** (Pre-requisite: Differentiability, Vectors) Partial derivatives (first and higher order), composite function, Total derivative, Euler's Theorem on homogeneous functions in two variables, Maxima, minima and saddle points, Gradient, directional derivative (Self-Study: curl and divergence)	11	L1, L2, L3
3	**Complex Number** (Pre-requisite: Basics of Complex Numbers, De' Moivre's theorem) Power of complex expressions, Root of an equation using De' Moivres theorem, Hyperbolic functions, Inverse Hyperbolic functions, Separation into real and imaginary parts, Logarithm of complex number	7	L1, L2, L3

4	**Matrices I** (Pre-requisite: Types of matrices) Symmetric, Skew- symmetric, Hermitian, Skew-Hermitian and Orthogonal Matrices, Unitary Matrices, Rank, Row-Echelon form, Normal form, Non-Homogeneous system of linear algebraic equations, Homogeneous system of linear algebraic equations, Linear dependence and independence of vectors, Dependent Matrix, Independent Matrix, Inconsistent Matrix	12	L1,L2
5	**Calculus-II** (Pre-requisite: Definite Integral) Types of Improper Integrals and examples based on it, Beta and Gamma functions and their properties, Application of single integral in the evaluation of Surface area. (Self-Study: Volumes of revolutions using single integral, Curve Tracing)	11	L1, L2, L3
6	**Numerical Integration** Numerical integration - The numerical evaluation of an integral Rectangle method based on (piecewise) constant approximation, Trapezoidal rule based on (piecewise) linear approximation, Simpson's $1/3^{rd}$ rule, Simpson's $3/8^{th}$ rule, Interpolation with difference and shift operators, Newton's Cote's quadrature formulae based on generalized approximation.	9	L1, L2, L3

Books and References:

SN	Title	Authors	Publisher	Edition	Year
1	Calculus and Analytic geometry	G.B. Thomas and R.L. Finney	Pearson	9th Edition	2002
2	Advanced Engineering Mathematics	Erwin Kreyszig	John Wiley & Sons	9th Edition	2006
3	Engineering Mathematics for first year	Veerarajan T	Tata McGraw-Hill, New Delhi	3rd Edition	2008

4	Higher Engineering Mathematics	Ramana B.V	Tata McGraw Hill, New Delhi	11th Edition	2010
5	Higher Engineering Mathematics	B.S. Grewal	Khanna Publishers	36th Edition	2010
6	A text book of Engineering Mathematics	N.P. Bali and Manish Goyal	Laxmi Publications	9th Edition	2008

Online References:

Sr. No	Website Name	URL	Module Covered
1	Openstax	https://openstax.org/	M1-M6
2	Lumanlearning.com	https://courses.lumanlearning.com	M1-M6

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<tr><td colspan="8">Course Name: Basic Electrical Engineering</td><td colspan="3">Course Code: ESC1101</td></tr>
<tr><td colspan="4">Teaching Scheme (Program Specific)</td><td colspan="7">Examination Scheme (Formative/ Summative)</td></tr>
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The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)</td></tr>
<tr><td colspan="10">Prerequisite: 10+2 level knowledge of basic physics and mathematics</td></tr>
</table>

Course Objective: The Course intends to provide comprehensive idea about AC and DC circuit analysis,working principles & applications of basic electrical machines and power devices in electrical engineering.

Course Outcomes: Upon completion of the course students will be able to:

Sr. No.	Course Outcome	Revised Bloom Taxonomy Level
CO1	To understand the basic fundamentals of DC circuit	L1, L2, L3
CO2	To understand basic theorem and how to apply them for analysis of DC circuit.	L1, L2, L3
CO3	To understand the basic fundamentals of single-phase AC circuit.	L1, L2, L3
CO4	To evaluate and analyze single and three phase AC circuits	L1, L2, L3

CO5	To articulate various type of electrical machine and their working principles.	L1, L2, L3
CO6	To understand the principle of SCR and TRIAC	L1, L2, L3

Detailed Syllabus (Total No. of Hours: 45):

Module No.	Topics	Lectures	Cognitive levels of attainment as per Bloom's Taxonomy
1	**FUNDAMENTALS OF DC CIRCUITS** DC Circuits (Only independent source), Kirchhoff'sLaws, Ideal and practical, Voltage and current Sources, Source Transformation, Mesh and Nodal Analysis, Super Mesh, Soldering and its applications	08	L1, L2, L3
2	**DC THEOREMS** Superposition Theorem, Thevenin's Theorem Norton's Theorem and Maximum Power Transfer Theorem	09	L1, L2, L3
3	**FUNDAMENTALS OF AC CIRCUITS** Generation of alternating voltage, basic definitions, average and rms values, phasor representation of sinusoidal waveforms, peak and rms values, phasor representation, sums on phasors.	05	L1, L2, L3
4	**ANALYSIS OF AC CIRCUIT** Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series), real power, reactive power, apparent power, power factor, Measurement of Power, Resonance, Q factor, Generation of Three-Phase Voltages, voltage andcurrent relationships in Star and Delta Connections	08	L1, L2, L3

5	**ELECTRICAL MACHINES** Principle & Construction of Transformer, Ideal and practical transformer, equivalent circuit, losses in transformers, OC & SC test, efficiency. Induction Motor: Generation of rotating magneticfields, Construction and working of a three-phaseinduction motor,	09	L1, L2, L3
6	**POWER DEVICES** Introduction to SCR and TRIAC, Applications of SCR and TRIAC, Full wave rectifier, full wave inverter, Buck Chopper, Boost Chopper	06	L1, L2, L3

Suggested List of experiments/demonstrations:

Practical Number	Type of Experiment	Practical/ Experiment Topic	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1.	**Basic Experiments**	Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope, resistors, capacitors and inductors	2	L1, L2
2.		Introduction to soldering and Multisim software for circuit.	2	L1, L2, L3
3.		Verification of Mesh Analysis	2	L1, L2, L3
4.		Verification of Nodal Analysis	2	L1, L2, L3
5.		Demonstration of different types of AC waveforms on CRO	2	L1, L2, L3
6.		Verification of Thevenin's theorem	2	L1, L2, L3
7.		Verification of Superposition Theorem.	2	L1, L2, L3

8.	**Design based Experiments**	Verification for Maximum Power Transfer Theorem.	2	L1, L2, L3
9.		Demonstration of cut-out sections of electrical machines	2	L1, L2
10.		Study V-I Characteristic of SCR	2	L1, L2
11.		Demonstration of Speed control of AC Motor.	2	L1, L2, L3
12.		Design RLC series circuit and verify resonance frequency	2	L1, L2, L3
13.		Three-phase supply: Voltage and current relationships in star and deltaconnections.	2	L1, L2, L3
14.		To perform OC and SC test on single phase transformer to fine its parameters.	2	L1, L2, L3
15.		To calculate full load efficiency of a single phase transformer.	2	L1, L2, L3
Total			**30**	

Suggested /Reference Books:

SN	Title	Authors	Publisher	Edition	Year
1	Basic Electrical Engineering	D.P. Kothari and I.J. Nagrath	Tata McGraw Hill	Fourth edition	2019
2	Basic Electrical Engineering	D.C. Kulshreshtha	Tata McGraw Hill	Second Edition	2019
3	Fundamentals of Electrical Engineering	L.S. Bobrow	Oxford University Press	Asian edition	2013
4	Electrical and Electronics Technology	E. Hughes	Pearson	Tenth Edition	2010
5	Electrical Engineering Fundamentals	Vincent Deltoro	Prentice Hall India	Second Edition	2015
6	Electric Machines	Ashfaq Husain	Dhanpat Rai & Co. (P) Limited	Third edition	2016

7	Power Electronics: Circuits, Devices & Application	Muhammad H. Rashid	Pearson	Fourth Edition	2017

Online References:

Sr. No	Website Name	Online links	Modules
1.	NPTEL	https://nptel.ac.in/courses/108/105/108105053/	M1, M2, M4,M5
2.	NPTEL	https://nptel.ac.in/courses/108/105/108105066/	M6
3.	NPTEL	https://nptel.ac.in/noc/courses/noc20/SEM2/noc20-ee68/	M1, M2, M4,M5
4.	NPTEL	https://archive.nptel.ac.in/courses/108/105/108105112/	M1, M2, M3, M4, M5

F.E./F.T. Semester –I
Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)
TCET Autonomy Scheme (w.e.f. A.Y. 2024-25)

B.E./B.Tech (All Branches)								**F.E./ F.T (SEM: I)**		
Course Name: Engineering Graphics &Design								**Course Code:** ESC1102		
Teaching Scheme (Program Specific)					**Examination Scheme (Formative/Summative)**					
Modes of Teaching/Learning/Weightage					**Modes of Continuous Assessment/Evaluation**					
Hours Per Week					**Theory (100)**			**Practical/ Oral(25)**	**Term Work (25)**	**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**ISE**	**IE**	**ESE**	**PR**	**TW**	**150**
2	-	4	6	4	20	20	60	25	25	
ISE: In-Semester Examination - Paper Duration – 1.5 Hours **IE: Innovative Examination**										
ESE: End Semester Examination - Paper Duration - 3 Hours										
The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)										
Prerequisite: Basic geometrical terminology and simple constructional procedures of plane, solids and engineering curves.										

Course Objective: The Course intends to introduce the universal language of engineers foreffective communication through drafting exercises of geometrical solids along with the useof computer aided drafting software.

Course Outcomes: Upon completion of the course students will be able to:

SN	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
1	Use drawing instruments and apply standard dimensioning system to construct engineering curves like Ellipse, parabola, hyperbola Cycloid, Involutes by different methods. Learners will also be able to use the basics software toolbars such as Draw, Modify, Dimension etc.	L1, L2, L3

2	Visualize and draw/construct the different types of lines and planes inclined to both reference planes.	L1, L2, L3
3	Represent 3D solid object on 2D plane with different angle of view. They will also be able to read the hidden parts as per different types of cutting plane. Learners will also be able to create computer-aided geometric design in 2D form with CADsoftware	L1, L2, L3
4	Know different types of standard solids and visualize projection of solid inclined to both the reference planes.	L1, L2, L3
5	Visualize sectional view of solids cut by different types of cutting planes and also learn the method to develop the lateral surfaces of sectioned solids	L1, L2, L3
6	Read and interpret the given 2-D views and convert it into the3D Isometric view. Learners will also be able to create computer-aided geometric design in 3D form with CAD software	L1, L2, L3

Detailed Syllabus (Total No. of Hours: 30):

Module No.	Topics	Lectures	Cognitive levels of attainment as per Bloom's Taxonomy
01	**Introduction to Engineering Graphics &Design** Principles of Engineering Graphics and their significance, usage of Drawing instruments, Lettering, Dimensioning, Ellipse (Focus Directrix, Concentric Circle method), Parabola (Focus Directrix method, Rectangular method) & Hyperbola (Focus- Directrix method), Cycloid and Involute; Scales–Plain, Diagonal and Vernier Scales ***Computer Graphics** Engineering Graphics Software; Listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Tool bars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs,	05	L1, L2, L3

	Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.		
02	**Projection of Points, Lines** Projections of Points and lines inclined to any one or both the reference planes (Note: No side view of line)	05	L1, L2, L3
03	**# Orthographic Projections** Principles of Orthographic Projections- Conventions- Draw the orthographic views of geometrical solids, objects from industry and dwellings. (1st angle method of projection) **# Sectional Orthographic Projections** Draw the sectional orthographic views of geometrical solids, objects from industry and dwellings (Only Full Section) ***Annotations, layering & other functions** Applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines (extend/ lengthen); Printing documents to paper using the print command; orthographic projection techniques; Drawing annotation, Computer-aided design (CAD) softwaremodeling of parts and assemblies	04	L1, L2, L3
04	**Projections of Regular Solids** Solid (Prism, Cylinder, Pyramid, Cone) inclined to both the Planes **@** Floor plans thatinclude: windows, doors, and fixtures such as WC, bath, sink, shower, etc. Floor plan of college building.	06	L1, L2, L3

05	**Sections and Sectional Views of Right Angular Solids** Section views of Pyramid, Cone-Use change of position or Auxiliary plane method for True Shape of Section; Development of surfaces of Right Regular Solids-Pyramid, and Cone; (Note: only cutting plane AIP and AVP will be considered)	05	L1, L2, L3
06	**# Isometric Projections** Principles of Isometric projection. Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa Conventions. ***Customization & CAD Drawing** Consisting of set up of the drawing page and the printer, including scale settings, setting upof units and drawing limits; ISO and ANSIstandards for coordinate dimensioning; Orthographic constraints, Snap to objectsmanually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines, Applyingvarious ways of drawing circles ***Introduction to 3D drawing in Graphicssoftware** ***Demonstration of a simple team designproject** Creation of engineering models and theirpresentation in standard 2D blue print form	05	L1, L2, L3

@ - to be covered only as a part of Term-Work

* - to be covered during Practical

Suggested List of Practical/ Experiments:

Practical Number	Type of Experiment	Practical/ Experiment Topic	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Basic Experiments**	Engineering Curves	02	L1, L2, L3
2		Projection of Lines	02	L1, L2, L3
3		Projection of Solids	04	L1, L2, L3
4		Section of Solids	04	L1, L2, L3
5		Development of Lateral Surfaces	04	L1, L2, L3
6		Orthographic Projections	04	L1, L2, L3
7		Sectional Orthographic Projections	04	L1, L2, L3
8		Isometric Views (Flat Surface)	02	L1, L2, L3
9		Isometric Views (Curved Surface)	04	L1, L2, L3
10	**Design Experiments**	Basics of CAD Software	04	L1, L2
11		Orthographic Projections on CAD Software	06	L1, L2, L3
12		Sectional Orthographic Projections on CADSoftware	06	L1, L2, L3
13		Reading Orthographic Projections on CADSoftware	04	L1, L2, L3
14		Isometric Views on CAD Software	06	L1, L2, L3
15	**Group Activities**	Floor plan of college building.	04	L1, L2
Total			**60**	

Books and References:

SN	Title	Authors	Publisher	Year
1	Engineering Drawing	Bhatt N.D., Panchal V.M. & Ingle P.R	Charotar Publishing House	2014
2	Engineering Drawing and Computer Graphics	Shah, M.B. & Rana B.C	Pearson education.	2008
3	Engineering Graphics	Agrawal B. &Agrawal C. M	TMH Publication	2012

4	Text book on Engineering Drawing	Narayana, K.L. & P Kannaiah	Sci-tech Publishers	2008

Online References:

Sr. No.	Website Name	URL	Module covered
1	Bharatskills.Gov	https://www.google.com/url?sa=t&source=web&rct=j&url=https://bharatskills.gov.in/pdf/E_books/Engineering_Drawing_1st_Sem_inal.pdf&ved=2ahUKEwiDu7bWyIPsAhXHyzgGHcszBSsQFjAAegQIAhAB&usg=AOvVaw2O9fIhYnp73593X8_Q8mW2	M1-M6
2	IIT-D	https://www.google.com/url?sa=t&source=web&rct=j&url=http://web.iitd.ac.in/~achawla/public_html/201/lectures/sp46.pdf&ved=2ahUKEwiA1vzfyYPsAhX5H7cAHec1DxUQFjAMegQIBBAB&usg=AOvVaw2wKQuj2zCOK9jNoREpOoAl	M1-M6
3	NCTM	https://www.nctm.org/ClassroomResources/Illuminations/Interactives/Isometric-Drawing-Tool/	M6

TERM WORK:

Component – 1
Component – 1 will consist of at least 5 drawing sheets based on different topics of entire syllabus.
Drawing Sheet – 1: Projection of Solids (3 Problems)
Drawing Sheet – 2: Section of Solids and Development of lateral surfaces (2 Problems)
Drawing Sheet – 3: Orthographic Projection without section (2 Problems)
Drawing Sheet – 4: Orthographic Projection with section (2 Problems)
Drawing Sheet – 5: Isometric Views (3 Problems)

Component-2
Printouts **(preferably on A3 size sheet)** of each from:
1. Orthographic Projections – at least 2 problems.
2. Orthographic Projections with Section –– at least 2 problems
2. Isometric Views – at least 2 problems
3. Reading of Orthographic Projections – at least 1 problem.

Note: -2 hrs. /week Auto CAD Practical is essential for completing the Auto CAD

Drawings and take required printouts.

AutoCAD Examination: (1 hr.):

1) Minimum 1 problem based on above AutoCAD syllabus for 25 marks

Theory Examination:

1) Question paper could comprise of 4 sections consisting of MCQs, Short Answer Question, Long answer Questions etc.
2) All 4 sections need to be solved.
3) Marks of each topic could be proportional to number of hours assigned to each Module.

F.E./F.T. Semester –I

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education - (CBCGS-HME 2023)

TCET Autonomy Scheme (w.e.f. A.Y. 2024-25)

<table>
<tr><td colspan="8">B.E. (COMP/ CIVIL / E&CS / CSE) / B.Tech. (IoT/ AI&DS)</td><td colspan="3">F.E./ F.T (SEM: I)</td></tr>
<tr><td colspan="8">Course Name: Workshop & Manufacturing Practices - I</td><td colspan="3">Course Code: ESC1103</td></tr>
<tr><td colspan="5">Teaching Scheme (Program Specific)</td><td colspan="6">Examination Scheme (Formative/ Summative)</td></tr>
<tr><td colspan="5">Modes of Teaching / Learning / Weightage</td><td colspan="6">Modes of Continuous Assessment / Evaluation</td></tr>
<tr><td colspan="5" rowspan="2">Hours Per Week</td><td colspan="3">Theory (00)</td><td>Practical/Oral (25)</td><td>Term Work (00)</td><td>Total</td></tr>
<tr><td>Theory</td><td>Tutorial</td><td>Practical</td><td>Contact Hours</td><td>Credits</td><td>ISE</td><td>IE</td><td>ESE</td><td>PR</td><td>TW</td><td rowspan="2">25</td></tr>
<tr><td>-</td><td>-</td><td>2</td><td>2</td><td>1</td><td>-</td><td>-</td><td>-</td><td>25</td><td>-</td></tr>
<tr><td colspan="10">The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)</td></tr>
<tr><td colspan="10">Prerequisite: Basic knowledge of Manufacturing Techniques</td></tr>
</table>

Course Objective: The course intends to give exposure to different Manufacturing Practices Techniques and thereby understand how to fabricate components using different materials. Also, it is important to have basic knowledge of Assembling and dismantling of different components.

Course Outcomes: Upon completion of the course students will be able to:

Sr. No	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
CO1	Identify tools, equipment and safety rules of workshop & manufacturing practice.	L1, L2
CO2	Understand tools and process of fitting.	L1, L2
CO3	Identify different plumbing processes and its different connections.	L1, L2
CO4	Understand tools and process of carpentry.	L1, L2

CO5	Identify the types of welding and its different joints.	L1, L2
CO6	Understand the various procedure involved in domestic pipeline	L1, L2

Suggested List of Practical/ Experiments:

Practical Number	Practical/ Experiment Topic	Hrs.	Cognitive levels of attainment as per Bloom's Taxonomy
1	Straight Fitting	10	L1, L2
2	Internal Threading on Pipe	2	L1, L2, L3
3	External Threading on Pipe	2	L1, L2, L3
4	Wooden Tray	10	L2, L3
5	Butt Joint by Arc Welding	2	L1, L2, L3
6	Butt Joint by Gas Welding	2	L1, L2, L3
7	Domestic Pipe Line	2	L1, L3
Total		**30**	

Books and References:

Sr. No.	Title	Authors	Publisher	Edition	Year
1	Elements of Workshop Technology	Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K	Media promoters and publishers private limited, Mumbai	1/2	2008 & 2010
2	Manufacturing Engineering and Technology	Kalpakjian S. And Steven S. Schmid	Pearson education.	4	2002
3	Manufacturing Technology	Gowri P. Hariharan and A. Suresh Babu	Pearson Education	-	2008

4	Processes and Materials of Manufacture	Roy A. Lindberg	Prentice Hall India	4	1998
5	Manufacturing Technology	Rao P.N	Tata McGraw Hill House	-	2017

Online References:

Sr. No.	Website Name	URL
1	Internal Threading	https://youtube.com/playlist?list=PLa9Oz2H1ezH8whSLFVuFytdcyH8cpKVvt
2	Plumbing	https://youtu.be/oMnZvSptiSw
3	Welding & Brazing	https://www.lucasmilhaupt.com/EN/Brazing-Academy/Brazing-vs-Welding.htm

F.E. Semester –I/ II

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education - (CBCGS-HME 2023)

TCET Autonomy Scheme (w.e.f. A.Y. 2024-25)

B.E. (All Branches)								**F.E. (SEM: I/ II)**		
Course Name: English for General and Professional Communication								**Course Code:** HSMC1101		
Teaching Scheme (Program Specific)					**Examination Scheme (Formative/ Summative)**					
Modes of Teaching / Learning / Weightage					**Modes of Continuous Assessment/ Evaluation**					
Hours Per Week					**Theory (100)**			**Practical/ Oral (25)**	**Term Work (25)**	**Total**
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**ISE**	**IE**	**ESE**	**OR**	**TW**	**125**
2	-	2	4	3	20	20	60	25	-	
ISA: In-Semester Examination- Paper Duration – 1 Hour **ESE: End Semester Examination - Paper Duration - 2 Hours** **The weightage of marks for continuous evaluation of Term work/ Report:** Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)										
Prerequisite- Basic knowledge of English language, Grammar and Vocabulary										

Course Objective: The course will be able to develop communication skills with professional and technical writing skills.

Course Outcomes: Upon completion of the course students will be able to:

Sr. No.	Course Outcomes	Cognitive Levels of Attainment as per Revised Bloom's Taxonomy
1	Understand communication fundamentals, identify and overcome barriers to effective communication	L1, L2, L3
2	Gain knowledge and skills in analyzing and creating word usage for different morphological processes	L1, L2, L3
3	Develop effective language skills	L1, L2, L3
4	Enhance and master professional writing	L1, L2, L3
5	Gain proficiency in technical writing	L1, L2, L3
6	Enhance Presentation Skills and be competent in public speaking	L1, L2, L3

Detailed Syllabus (Total No. of Hours: 30):

Module No.	Topics	Hrs.	Cognitive Levels of Attainment as per Revised Bloom's Taxonomy
1	**Communication Foundation** 1.1 Concept and Meaning: Etymology, Definition and Process of Communication 1.2 Barriers: Linguistic, Semantic, Personal, Socio-Psychological, Physical, Environmental, Mechanical, and Cross-Cultural 1.3 Networks of Communication: Understanding Organizational Communication 1.4 Methods of Communication: Verbal 1.5 Non-Verbal Communication	05	L1, L2, L3
2	**Word Formation** 2.1 Morphological Processes: Introduction to Morphology, Defining Morphemes and Morphology, Compounding Conversion, 2.2 Reduplication, Back-formation, Blending and Abbreviations 2.3 Homonyms, Homophones and Homographs 2.4 Eponyms: Meaning of Eponym, Cultural Eponyms, Eponyms in Science and Technology, Eponyms in Everyday Language, Comparative Analysis and Sociolinguistic Perspectives, Case Studies and Contemporary examples 2.5 Industry-Specific Jargons: Importance and Purpose of Industry, Common Industry-Specific Jargon, Technical Industries, Manufacturing and Engineering Industries, Information Technology	05	L1, L2, L3

3	**Basic Language Skills** 3.1 Listening: Concept, Process and Types of Listening, Active Listening Techniques, Assessing and Developing Listening Skills 3.2 Speaking: Introduction to Speaking, Speaking Strategies, speaking in Everyday Situations, Assessing and Developing Speaking Skills 3.3 Reading: Concept of reading, Types of reading– skimming, scanning, intensive, extensive 3.4 Writing: Importance of writing skills, Types of writing 3.5 Comprehension, Summarization, Abstract, Precis writing, Overview 3.6 Editing and Proofreading: Concept of editing and proofreading, Difference between editing and proofreading, Types of Editing	06	L1, L2, L3
4	**Professional Writing Skills** 4.1 Business Correspondence: 4.2 Email Correspondence: Importance and Ethics of professional email communication, Writing Professional Emails 4.3 Content creation for Digital media, Content Creation for Blogs and Websites 4.4 Professional Reports: Report Writing, Structure and Types of report, Minutes of meeting	04	L1, L2, L3
5	**Technical Writing** 5.1 Introduction to Technical Writing: Definition, Importance of Technical Writing, Writing Technical Proposal 5.2 Writing Technical Research Paper 5.3 Ethical and Professional Writing Considerations: Integrity and Plagiarism 5.4 Engineering Documentation: Writing Instructions, manuals	04	L1, L2, L3
6	**Presentation Skills** 6.1 Mastering the Basics: The 5W1H of Presentation Skills 6.2 Techniques for effective presentation 6.3 Audience Analysis and Adaptation 6.4 Body Language and Vocal Delivery 6.5 3 Ps of Presentation: Planning, Preparing and Practicing 6.6 Handling Q&A Sessions	06	L1, L2, L3

Suggested List of Practical/ Experiments:

Practical Number	Type of Experiment	Practical/ Experiment Topic	Hrs.	RBT Levels
1	Application based experiments	Conversation Starters	2	L1, L2, L3
2	Application based experiments	Situational Conversations (Practice 1)	2	L1, L2, L3
3	Application based experiments	Situational Conversations (Practice 2)	2	L1, L2, L3
4	Basic Experiments	Conducting meetings	2	L1, L2, L3
5	Basic Experiments	Panel Discussion	2	L1, L2, L3
6	Application based experiments	Compeering	2	L1, L2, L3
7	Basic Experiments	Activities based on Basic Language Skills Writing	2	L1, L2, L3
8	Application based experiments	Writing	2	L1, L2, L3
9	Basic Experiments	Reading	2	L1, L2, L3
10	Application based experiments	Speaking	2	L1, L2, L3
11	Basic Experiments	Listening	2	L1, L2, L3
12	Basic Experiments	Practice Sessions in Language Lab (Consonants, Vowels, Diphthongs)	2	L1, L2, L3
13	Basic Experiments	Practice Tests on Pronunciation	2	L1, L2, L3
14	Basic Experiments	Editing	2	L1, L2, L3
15	Basic Experiments	Proofreading	2	L1, L2, L3

Books and References:

Sr. No	Name of the Book	Name of the Author	Publisher	Edition	Year of Publication
1	Practical English Usage	Michael Swan	OUP	4th Edition	1995
2	Remedial English	F.T. Wood	Macmillan	2014 Edition	2007

	Grammar				
3	On Writing Well	William Zinsser	Harper Resource Book	25th Anniversary Edition	2001
4	Study Writing	Liz Hamp-Lyons and Ben Heasly	Cambridge University Press	2nd Edition	2006
5	Communication Skills	Sanjay Kumar and PushpLata	OUP	1st Edition	2011
6	Exercises in Spoken English Parts. I-III	CIEFL	University Press	1997 Edition	1997

Online References:

Sr. No.	Website Name	URL	Modules Covered
1	Coursera	https://www.coursera.org/learn/speak-english-professionally	M 1-M 6
2	NPTEL	https://nptel.ac.in/courses/109/106/109106129/	M 1-M 6
3	NPTEL	https://nptel.ac.in/courses/109/106/109106094/	M 1-M 6

F.E. / F.T Semester –I
Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education - (CBCGS-HME 2023)
TCET Autonomy Scheme (w.e.f. A.Y. 2024-25)

<table>
<tr><td colspan="5">B.E. (All Branches)</td><td colspan="5">F.E. (SEM: I)</td></tr>
<tr><td colspan="5">Course Name: Attitude & Aptitude Development I</td><td colspan="5">Course Code: MC1101</td></tr>
<tr><td colspan="5">Teaching Scheme (Program Specific)</td><td colspan="5">Examination Scheme (Formative/ Summative)</td></tr>
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<tr><td rowspan="2">OR</td><td rowspan="2">TW</td><td rowspan="3">25</td></tr>
<tr><td>Theory</td><td>Tutorial</td><td>Practical</td><td>Contact Hours</td><td>Credits</td><td>ISE</td><td>IE</td><td>ESE</td></tr>
<tr><td>1</td><td>-</td><td>-</td><td>1</td><td>Non-Credit</td><td>-</td><td>-</td><td>-</td><td>-</td><td>25</td></tr>
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<tr><td colspan="10">Prerequisite- Basic knowledge of English language, Grammar and Vocabulary</td></tr>
</table>

Course Objective: The course will be able to enhance the attitude, aptitude and logical level of the students up to their potentials.

Course Outcomes: Upon completion of the course students will be able to:

Sr. No.	Course Outcomes	Cognitive Levels of Attainment as per Bloom's Taxonomy
1	Understand personality concepts and effectively respond to success and failure using SWOT analysis.	L1, L2, L3
2	Grasp the concept, types, and formation of attitudes through various influences and balancing techniques.	L1, L2, L3
3	Improve verbal reasoning skills, including grammar, vocabulary, and comprehension.	L1, L2, L3
4	Master fundamental quantitative concepts like number systems, ratios, percentages, and more.	L1, L2, L3
5	Enhance their logical reasoning abilities in areas such as series, analogies, and deductions.	L1, L2

6	Solve arithmetical problems involving races, clocks, calendars, and series identification.	L1, L2, L3

Detailed Syllabus (Total No. of Hours: 15):

Module No.	Topics	Hrs.	Cognitive Levels of Attainment as per Revised Bloom's Taxonomy
1	**Introduction to Personality Development** 1.1 Concept and Meaning of Personality 1.2 Significance of Personality Development 1.3 Responding to Success and Failure 1.4 SWOT analysis	02	L1, L2, L3
2	**Attitude & Motivation** 2.1 Attitudes: Concept, Objectives 2.2 Types of Attitude 2.3 Development of Attitudes through parents, peers and conditioning 2.4 Forming Attitude by balance and measurement of Attitude	02	L1, L2, L3
3	**Verbal Reasoning -I** 3.1 Para Jumbles. 3.2 Reading Comprehension. 3.3 Vocabulary, Synonym, Antonyms, Analogies. 3.4 Grammar: Nouns, Articles, Pronouns, etc.	02	L1, L2, L3
4	**Quantitative Aptitude-I** 4.1 Number System, Numbers, & Ages. 4.2 Averages, Ratios, & Proportions. 4.3 Percentages. 4.4 Mixtures & Allegations.	04	L1, L2, L3
5	**Logical Reasoning Ability-I** 5.1 Directions, and Blood Relations. 5.2 Coding & Decoding. 5.3 Letter Series, and Number Series. 5.4 Analogies, and Cubes.	03	L1, L2

	5.5 Logical Deductions, and Venn Diagrams. 5.6 Assumption, Inferences, and Arguments.		
6	**Arithmetical Ability** 6.1 Races and Games 6.2 Clocks 6.3 Calendars 6.4 Odd man out and Series	02	L1, L2, L3
	Total	**15**	

Books and References:

SN	Name of the Book	Name of the Author	Publisher	Edition	Year of Publication
1	Quantitative Aptitude for Competitive Examinations	R.S. Aggarwal	S. Chand	-----	------
2	A Modern Approach to Verbal & Non-Verbal Reasoning	R.S. Aggarwal	S. Chand	-----	-----
3	A Modern Approach to Logical Reasoning	R.S. Aggarwal	S. Chand	-----	-----
4	Puzzles to Puzzle You	Shakuntala Devi	Orient	-----	2005

Online References:

Sr. No.	Website Name	URL	Modules Covered
1	NPTEL	shttps://onlinecourses.nptel.ac.in/noc22_hs77/preview	M 1, M 2
2	www.indiabix.com	https://www.indiabix.com/verbal-ability/questions-and-answers/	M 3
3	Management Assessment Tests	https://www.practiceaptitudetests.com/industry/management/	M 4, 5, 6