COURSE HAND-OUT

IKGPTU B.TECH. - SEMESTER I

DEPARTMENT OF MECHANICAL ENGINEERING

BHAI GURDAS INSTITUTE OF ENGINEERING AND TECHNOLOGY (BGIET)

VISION

TO IMPART VALUE BASED MULTIDISCIPLINARY QUALITY EDUCATION TO THE STUDENTS WHICH CAN ENABLE THEM

TO CONTRIBUTE THEIR KNOWLEDGE IN INDUSTRIAL DEVELOPMENT, TECHNOLOGY REVOLUTION AND ECONOMIC GROWTH OF THE NATION WITH GLOBAL PERSPECTIVE.

MISSION

Mission No.	Mission Statements:
M1	To develop technical manpower of quality standards with capabilities of accepting new challenges.
M2	To provide teaching and research environment.
M3	To promote collaborative coexistence amongst academic institute and industries for resources sharing.

BHAI GURDAS INSTITUTE OF ENGINEERING & TECHNOLOGY
Department of Mechanical Engineering

Vision

To create pool of Mechanical Engineers having multi-disciplinary quality to contribute their knowledge in industrial development, technology, social and economical growth of the nation.

Mission

The mission of the Mechanical Engineering Department are :
1. To offer an outstanding, professionally oriented undergraduate engineering and post graduate education
2. To develop technical manpower of quality standards with capabilities of accepting new challenges.
3. To conduct applied research and consultancy service that will bring qualitative change in manufacturing industry and technical services.

About the Department

The department of Mechanical Engineering at BGIET is one of the pioneering departments of the Institute and came into being with undergraduates program in 2003 with 60 seats ,further increased to 120 seats in 2011.In the last two decades, the department has made a steady progress and growth in stature. Since, 2011 the department has increasingly focused on post graduate education and research and started postgraduate program with M.Tech. (Mechanical Engineering).

The department has well equipped labs which are regularly upgraded and modernized with latest equipment and software. The competent and experienced faculty of the department is extensively involved in cutting edge research; in addition to effective classroom teaching, they support beyond the classrooms and mentor the students for their careers. Faculty members also continuously work for their professional development by attending and organizing conferences and faculty development programme. The Department aims to produce quality professionals in Mechanical Engineering to compete globally and excel by carrying out basic and applied research in emerging areas by forging strong industry - institute cooperation

PROGRAMME OUTCOMES (POs)

PO1 Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6 The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (ME)

PSO1

PSO2

B.TECH 1st SEMESTER
 (Mechanical Engineering)

IK Gujral Punjab Technical University Bachelor of Technology Scheme for B.Tech Syllabus 2018

Slot	Course No.	Subject	L-T-P	Hours	Credits
A.	BTPH103-18	Physics	3-1-0	4	4
B.	BTPH113-18	Physics (Lab)	0-0-3	3	1.5
C.	BTAM101-18	Maths-I	3-1-0	4	4
D.	BTEE101-18	Basic Electrical Engineering	3-1-0	4	4
E.	BTEE102-18	Basic Electrical Engineering (L,ab)	0-0-2	2	1
F.	BTME101-21	Engineering Graphics & Design	1-0-5	6	3
G.	BMPD101-18	Mentoring and Professional Development	0-0-2	2	Noncredit

Total Credits = 17.5 Hours: 25

BTAM104-18MATHEMATICS PAPER-1

COURSE INFORMATION SHEET

PROGRAMME: ENGINEERING	DEGREE: B.TECH
COURSE- MATHEMATICS -I	SEMESTER-1 CREDITS-4
COURSE CODE- BTAM101-18 Year of introduction – 2021	COURSE TYPE - CORE
COURSE AREA/DOMAIN- MATHEMATICS	CONTACT HOURS: 4-1-0
CORRESPONDING LAB COURSE CODE (IF ANY): NIL	LAB COURSE NAME: NA

SYLLABUS:

MODULE	DETAILS	HOURS
I	**Calculus** Rolle's theorem, Mean value theorems, Taylor's and Maclaurin theorems with remainders; Indeterminate forms and L' Hôpital's rule; Maxima and minima; Evaluation of definite and Improper integrals; Applications of definite integrals to evaluate surface areas and volumes of revolutions	10
II	**Multivariable Calculus** Limit, continuity and partial derivatives, Total derivative; Tangent plane and normal line; Maxima, minima and saddle points; Method of Lagrange multipliers; Multiple Integration: double and triple integrals (Cartesian and polar), change of order of integration in double integrals, Change of variables (Cartesian to polar), Applications: areas and volumes by (double integration), Center of mass and Gravity (constant and variable densities).	15
III	**Sequences and Series** Convergence of sequence and series, tests for convergence of positive term series: root test, ratio test, p-test, comparison test; Alternate series and Lebinitz's test; Power series, Taylor's series, series for exponential, trigonometric and logarithmic functions.	12
IV	**Matrices** Algebra of matrices, Inverse and rank of a matrix, introduction of null space and kernel, statement of rank-nullity theorem; System of linear equations; Symmetric, skew-symmetric and orthogonal matrices; Determinants; Eigenvalues and eigenvectors; Similar matrices; Diagonalization of matrices; Cayley-Hamilton Theorem.	13

Total hours – 50

TEXT/REFERENCE BOOKS:

	BOOK TITLE/AUTHORS/PUBLICATION
1	G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2	Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3	T. Veerarajan, Engineering Mathematics for first year, Tata McGraw-Hill, NewDelhi, 2008.
4	B.V. Ramana, Higher Engineering Mathematics, Tata McGraw Hill New Delhi,11thReprint, 2010.
5	D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:

	BOOK TITLE SUGGESTED BY FACULTY
1	N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, LaxmiPublications, Reprint, 2008.
2	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.

- Chalk & Talk
- Small Group Instruction.
- Making real world connections
- Inquiry-based Learning

E- CONTENT USED:

- https://youtu.be/vfg1mmsSMMM
- https://youtu.be/1wjXVdwzgX8

ADDITIONAL TOPICS:

- Integral calculus, Double integrals,Triple Integrals
- Row-echelon form & Gaussian elimination.

Course Objectives

The objective of this course is to familiarize the prospective engineers with techniques in calculus, multivariate analysis and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

Course Code: MATHEMATICS-I	
Course Code: BTAM101-18	
Course Outcomes	BT

		Level
1.	Understand the fundamental concepts of pure and applied mathematics to enhance mathematical skills	2
2.	Apply differential and integral calculus to evaluate definite, improper integrals and its applications.	3
3.	Make use of limit, continuity, differentiation and determine the optimal points of single variable and multivariable functions	3
4.	Simplify the integration w.r.t multiple variables and also apply the same to determine the areas and volumes using double integration using change of order or change of variables, if needed.	4
5.	Determine the convergence and divergence conditions of various types of infinite series.	5
6.	Solve linear system of equations ,find the Eigen values and Eigen vectors and also apply Cayley Hamilton theorem.	6

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
3	2		2				1						1
3		2		2		1			1			1	
3	1		1		1			2					1
3		2	2			1				2	1	1	
3		1	2		2			1				1	
2	1	1				1				2	1		1

COURSE INFORMATION SHEET

AMME: B.Tech	
E: Basic Electrical Engineering	SEMESTER: 2nd CREDITS: 05
E CODE: BTEE-101-18	COURSE TYPE: Regular
E AREA/ DOMAIN: Basic Electrical	CONTACT HOURS: L T P 3 1 2
SPONDING LAB CODE: BTEE102-18	LAB COURSE NAME: Basic Electrical Engineering Laboratory

Course plan:

DETAILS	HOURS
Module 1: DC Circuits Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff's current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin's and Norton's Theorems. Time-domain analysis of first-order RL and RC circuits.	9
Module 2: AC Circuits Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations series resonance. Parallel resonance. Three-phase balanced circuits, voltage and current relations in star and delta connections.	13
Module 3: Electrical Machines Magnetic materials, BH characteristics, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections. Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic and speed control of separately excited dc motor. Construction and working of synchronous generators.	12
Module 4: Electrical Installations Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.	5
TOTAL HOURS	39

TEXT/ REFERENCE BOOKS:

T/R	BOOK TITLE/ AUTHORS/ PUBLICATION
T1	D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010
T2	D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009
R1	L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011
R2	E. Hughes, "Electrical and Electronics Technology", Pearson, 2010
R3	V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989

/R	BOOK TITLE SUGGESTED BY FACULTY
	S.K Sehdev by Unique Publisher
	J.B gupta by S. Chand Publisher

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:
Chalk & Talk
Small Group Instruction.
Making real world connections
Presentatons

Recommended NPTEL/ MOOCS/Swayam Courses/ Videos
1. **https://www.coursera.org/learn/electric-power-systems (Electric Power System)**
2. **https://www.youtube.com/watch?v=U3CubKnkO4c (Transformer 3D Animation)**
3. **https://www.youtube.com/watch?v=DsVbaKZZOFQ   (three phase induction motor working)**
4. **https://www.youtube.com/watch?v=tiKH48EMgKE&list=PLZY3yNTglIyWtOLxTl9ZlAK9zIgPK3H9d (working of alternator)**
5. **https://www.youtube.com/watch?v=gW45N2WpD64 (working of DC generator)**
6. **https://www.youtube.com/watch?v=QkbnOga09Vg (flip flops)**

Web Source References:

1	https://nptel.ac.in/courses/108108076/ (1-39) (Covering Transformer, Machines, power factor etc.)

ADDITIONAL TOPICS:
Providing knowledge about generation, transmission, distribution
Providing additional knowledge on protection of electrical machines, drives and power system
Course Objectives:

1) Impart a basic knowledge of electrical quantities such as current, voltage, power, energy and frequency to

   understand the impact of technology in a global and societal context.

2) Provide working knowledge for the analysis of basic DC and AC circuits used in electrical and electronic devices.

3) To explain the working principle, construction, applications of DC machines, AC machines & the importance of

   transformers in transmission and distribution of electric power.

   To Gain knowledge about the fundamentals of LT components of switchgear, wiring and earthing
COURSE OUTCOMES

CO-1:- Understand & apply Kirchoff's laws, network theorems, time domain analysis for RL& RC series circuit.

CO:-2 Understand and analyse phasor diagram and waveforms for purely resistive, purely inductive and purely capacitive as well as series and parallel R-L, R-C & R-L-C circuits and also circuit Resonance.

CO-3:- Understand concepts of Real, Reactive & apparent power and Power factor. Understand 3- phase supply and star and delta connection and their relationships. Power measurement by wattmeter

CO:-4 Understand construction & working principle of 1- phase and 3- phase transformers. Understand Ideal and practical transformer and auto-transformer and its applications as well.

CO:-5 Understand generation of rotating magnetic fields. Understand construction and working of 3-phase induction motor, 1-phase induction motor, DC motors& synchronous generators.

CO:-6 Understand LT Switchgear such as Switch Fuse Unit (SFU), MCB, ELCB, MCCB. Understand about wires, cables,

earthing & its importance. Understand about types of batteries & its important Characteristics. Understand basic

calculations for energy consumption & power factor improvement..

CO MAPPING WITH PO

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
3	1			1							2		
3	1			1							2		1
3	1			1							2		
1		1									2		
2		1									1		
2		1			1						2		

COURSE INFORMATION SHEET
BASIC ELECTRICAL ENGINEERING LAB

List of experiments/demonstrations:
Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope. Real-life resistors, capacitors and inductors.

Measuring the steady-state and transient time-response of R-L, R-C, and R-L-C circuits to a step change in voltage (transient may be observed on a storage oscilloscope). Sinusoidal steady state response of R-L, and R-C circuits –

impedance calculation and verification. Observation of phase differences between current and voltage. Resonance in R-L-C circuits.

Transformers: Observation of the no-load current waveform on an oscilloscope (non-sinusoidal wave-shape due to B-H curve nonlinearity should be shown along with a discussion about harmonics). Loading of a transformer: measurement of primary and secondary voltages and currents, and power.

Three-phase transformers: Star and Delta connections. Voltage and Current relationships (line-line voltage, phase-to-neutral voltage, line and phase currents). Phase-shifts between the primary and secondary side. Cumulative three-phase power in balanced three-phase circuits.

Demonstrate of cut-out sections of machines: dc machine (commutator-brush arrangement), induction machine (squirrel cage rotor), synchronous machine (field winging - slip ring arrangement) and single-phase induction machine.

Torque Speed Characteristic of separately excited dc motor.

Synchronous speed of two and four-pole, three-phase induction motors. Direction reversal by change of phase-sequence of connections. Torque-Slip Characteristic of an induction motor. Generator operation of an induction machine driven at super-synchronous speed.

Synchronous Machine operating as a generator: stand-alone operation with a load. Control of voltage through field excitation.

Course outcome

- Apply KCL, KVL and ohms law to Simple circuits.

- Determine the inductance of the coil & BH curve loops

- Performing the operation & tests of transformer and rotating machines ac & dc machines

- Analyze the differences in operation of different DC machine configurations.

- Experimentally verify the basic circuit theorems

- Measure power and power factor in ac circuits or in ac machines

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:

First-Hand Experience In Observation
Making Real World Connections
Implement Peer-Instruction.

MAPPING

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
2	1			1							1		1
2	1			1							1		1

2	1			1						1		
1		1								1	1	1
1		1								1		1
2		1		1						1		1

ENGINEERING GRAPHICS AND DESIGN

COURSE INFORMATION SHEET

PROGRAMME: MECHANICAL ENGINEERING	DEGREE: BTECH
COURSE: ENGINEERING GRAPHICS AND DESIGN (THEORY & LAB)	SEMESTER: 1 CREDITS: 3
COURSECODE:BTME101-21 REGULATION: 2021	COURSE TYPE: CORE
COURSE AREA/DOMAIN: ENGINEERING DRAWING	CONTACT HOURS: 1(L) + 5(P) hours/Week.

SYLLABUS:

UNIT	DETAILS	HOURS

I		18
	INTRODUCTION TO ENGINEERING DRAWING: Principles of engineering drawing / engineering graphics / technical drawing and their significance – Drawing Instruments: their Standard and uses – symbols and conventions in drawing practice – lettering & numbering – BIS conventions. Types of lines and their uses, Drawing Sheets: sizes and layout, methods of folding drawing sheet, Grades of pencils used, Dimensioning: definition, types and methods of dimensioning, geometrical construction, concept of scales in drawing, types of scales, construction of plane and diagonal scales	
II		12
	ORTHOGRAPHIC PROJECTIONS: Relevance of projection, Types of projections, Principles of orthographic projections in reference to quadrants – conventions – first and third angle projections, illustration through simple problems of projection; Projections of points in quadrants. Projections and trace of a line with different possible orientations in a quadrant. Methods to find true length and inclination of a line with principal planes.	
III	**PROJECTIONS OF PLANES AND SOLIDS:** Concept of plane and lamina, Projections of a lamina when; parallel to any reference plane, perpendicular to any reference plane, inclined to reference plane. Traces of planes. Definition of solid, types of solids – conventions-different possible orientations of solid in a quadrant. Projections of solid when; axis parallel to reference plane, perpendicular to reference plane, inclined to one and parallel to other reference plane, parallel to both horizontal and vertical planes.	18
IV		12
	ISOMETRIC PROJECTIONS: Principles of Isometric Projections-Isometric Scale- Isometric Views or drawing- Conventions. Isometric drawing / projections of solids such as cube, prisms, pyramids, cylinder, and cone.	
V	**Practice using Computer Aided Drafting (CAD) tools**: Hands on training on any CAD software to strengthen the understanding of the engineering drawing wherein the students will be introduced to a number of assignments as mentioned in the syllabus.	12

TEXT/REFERENCE BOOKS:

S.NO	BOOK TITLE/AUTHORS/PUBLICATION
1	Engineering Drawing- Basant Agarwal, TMH
2	D. M. Kulkarni, A. P. Rastogi, and A. K. Sarkar (2009), Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi.
3	P.S Gill, "Engineering Drawing", S K Kataria and sons, 18th edition, 2017 reprint
4	Jolhe, Dhananjay (2006), Engineering Drawing: With an Introduction to CAD, Tata Mc Graw Hill, India.
5	N. D. Bhat (2006), Engineering Drawing, Charotar Publications, New Delhi
6	Venugopal (2010), Engineering Drawing and Graphics, 2nd edition, New Age Publications, New Delhi
7	Trymbaka Murthy (2007), Computer Aided Engineering Drawing, I.K. International Publishers, New Delhi.
8	R.B. Choudary (2005), Engineering graphics with Auto CAD, Anuradha Publishers, New Delhi

T/R	BOOK TITLE SUGGESTED BY FACULTY
1	Harwinder Singh, Engineering Drawing and Computer Graphics , Dhanpat Rai Publishing Co.
2	R.K Dhawan, Text Book of Engineering Drawing, S Chand Publication.

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:

Chalk & Talk
Small Group Instruction.
Making real world connections
Presentatons

E- content used:

https://archive.nptel.ac.in/courses/112/102/112102304/

Additional topics:

1. Intersection of Surfaces/Solids
   Purpose of intersection of surfaces, Intersection between the two cylinder, two prisms, prism and pyramid, pyramid and pyramid, cylinder and prism, cone and cylinder, sphere and cylinder etc., use of cutting plane and line method.

2. Development of Surface
   Purpose of development, Parallel line, radial line and triangulation method. Development of prism, cylinder, cone and pyramid surface for both right angled and oblique solids, and development of surface of sphere.

COURSE OBJECTIVES:

1. To understand the basic principles of engineering drawing
2. To have the knowledge of generating the pictorial views
3. To understand the development of surfaces
4. Use CAD tools for making drawings of machine components and assemblies.
5. To have the knowledge of interpretation of dimensions of different quadrant projections.

.**COURSE PRE-REQUISITES:**

C.CODE	COURSE NAME	DESCRIPTION	SEM

COURSE OUTCOMES:

S.NO	DESCRIPTION	Bloom's Level (B.L)
CO1	Prepare and **understand** drawings	B.L -1
CO2	**Use** the principles of orthographic projections.	B.L -3
CO3	By studying about projections of solids, students will be **able to visualize** three dimensional objects and that will **enable** them to design new products.	B.L-2 B.L -3
CO4	**Design and fabricate** surfaces of different shapes.	B.L- 6
CO5	**Apply** Computer-aided design (CAD) software to modeling of parts and assemblies, dimensions, and annotations to drawing.	B.L -3
CO6	**Represent** and **create** the objects in three dimensional appearances.	B.L -1 B.L -6

PROGRAME SPECIFIC OUTCOMES:

S.NO	DESCRIPTION
PSO1	Graduates of Mechanical Engineering will be engineering professionals and innovators in core engineering, service industries or pursue higher studies.
PSO2	Graduates of Mechanical Engineering will be team players who are equipped to provide sustainable solutions for complex interdisciplinary problems using modern tools.
PSO3	Graduates of Mechanical Engineering will be able to engage in professional activities ethically and thereby enhance the knowledge and contribution towards the society through lifelong learning.

CO –PO-PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-	2	-	-
CO3	-	3	3	3	-	-	-	-	-	-	-	3	2	-	-
CO4	-	-	2	-	-	-	-	-	-	2	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	3	3	-	3	-	1	-
CO6	-	-	-	-	3	-	-	-	-	-	-	3	-	-	-

Prepared by   Approved By

                                                        HOD

ENGINEERING GRAPHICS AND DESIGN

COURSE INFORMATION SHEET

PROGRAMME: COMPUTER SCIENCE & ENGINEERING	DEGREE: BTECH
COURSE: ENGINEERING GRAPHICS AND DESIGN (THEORY & LAB)	SEMESTER: 1 CREDITS: 3
COURSECODE:BTME101-21 REGULATION: 2021	COURSE TYPE: CORE
COURSE AREA/DOMAIN: ENGINEERING DRAWING	CONTACT HOURS: 1(L) + 5(P) hours/Week.

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Chalk & Talk
Small Group Instruction.
Making real world connections
Presentatons

E- content used:

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Additional topics:

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Purpose of intersection of surfaces, Intersection between the two cylinder, two prisms, prism and pyramid, pyramid and pyramid, cylinder and prism, cone and cylinder, sphere and cylinder etc., use of cutting plane and line method.

2. Development of Surface
Purpose of development, Parallel line, radial line and triangulation method. Development of prism, cylinder, cone and pyramid surface for both right angled and oblique solids, and development of surface of sphere.

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2. To have the knowledge of generating the pictorial views
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.## COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM

COURSE OUTCOMES:

S.NO	DESCRIPTION	Bloom's Level (B.L)
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CO2	**Use** the principles of orthographic projections.	B.L -3
CO3	By studying about projections of solids, students will be **able to visualize** three dimensional objects and that will **enable** them to design new products.	B.L-2 B.L -3
CO4	**Design and fabricate** surfaces of different shapes.	B.L- 6
CO5	**Apply** Computer-aided design (CAD) software to modeling of parts and assemblies, dimensions, and annotations to drawing.	B.L -3
CO6	**Represent** and **create** the objects in three dimensional appearances.	B.L -1 B.L -6

PROGRAME SPECIFIC OUTCOMES:

S.NO	DESCRIPTION
PSO1	To design and implement sustainable solutions by new ideas and innovations in the field of computer science
PSO2	To use problem solving skills to develop efficient solutions to simplify real world problems

CO –PO-PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	3	3	3	-	-	-	-	-	-	-	3	-	-
CO4	-	-	2	-	-	-	-	-	-	2	-	-	-	-
CO5	-	-	-	-	-	-	-	-	3	3	-	3	1	2
CO6	-	-	-	-	3	-	-	-	-	-	-	3	1	1

Prepared by   Approved By

                                                                            HOD

ENGINEERING GRAPHICS AND DESIGN

COURSE INFORMATION SHEET

PROGRAMME: ELECTRICAL ENGINEERING	DEGREE: BTECH
COURSE: ENGINEERING GRAPHICS AND DESIGN (THEORY & LAB)	SEMESTER: 1 CREDITS: 3
COURSECODE:BTME101-21 REGULATION:2021	COURSE TYPE: CORE
COURSE AREA/DOMAIN: ENGINEERING DRAWING	CONTACT HOURS: 1(L) + 5(P) hours/Week.

SYLLABUS:

UNIT	DETAILS	HOURS
I	**INTRODUCTION TO ENGINEERING DRAWING:** Principles of engineering drawing / engineering graphics / technical drawing and their significance – Drawing Instruments: their Standard and uses – symbols and conventions in drawing practice – lettering & numbering – BIS conventions. Types of lines and their uses, Drawing Sheets: sizes and layout, methods of folding drawing sheet, Grades of pencils used, Dimensioning: definition, types and methods of dimensioning, geometrical construction, concept of scales in drawing, types of scales, construction of plane and diagonal scales	18
II	**ORTHOGRAPHIC PROJECTIONS:** Relevance of projection, Types of projections, Principles of orthographic projections in reference to quadrants – conventions – first and third angle projections, illustration through simple problems of projection; Projections of points in quadrants. Projections and trace of a line with different possible orientations in a quadrant. Methods to find true length and inclination of a line with principal planes.	12
III	**PROJECTIONS OF PLANES AND SOLIDS:** Concept of plane and lamina, Projections of a lamina when; parallel to any reference plane, perpendicular to any reference plane, inclined to reference plane. Traces of planes. Definition of solid, types of solids – conventions-different possible orientations of solid in a quadrant. Projections of solid when; axis parallel to reference plane, perpendicular to reference plane, inclined to one and parallel to other reference plane, parallel to both horizontal and vertical planes.	18
IV	**ISOMETRIC PROJECTIONS:** Principles of Isometric Projections-Isometric Scale- Isometric Views or drawing- Conventions. Isometric drawing / projections of solids such as cube, prisms, pyramids, cylinder, and cone.	12
V	**Practice using Computer Aided Drafting (CAD) tools**: Hands on training on any CAD software to strengthen the understanding of the engineering drawing wherein the students will be introduced to a number of assignments as mentioned in the syllabus.	12

TEXT/REFERENCE BOOKS:

S.NO	BOOK TITLE/AUTHORS/PUBLICATION
1	Engineering Drawing- Basant Agarwal, TMH
2	D. M. Kulkarni, A. P. Rastogi, and A. K. Sarkar (2009), Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi.
3	P.S Gill, "Engineering Drawing", S K Kataria and sons, 18th edition, 2017 reprint
4	Jolhe, Dhananjay (2006), Engineering Drawing: With an Introduction to CAD, Tata Mc Graw Hill, India.
5	N. D. Bhat (2006), Engineering Drawing, Charotar Publications, New Delhi
6	Venugopal (2010), Engineering Drawing and Graphics, 2nd edition, New Age Publications, New Delhi
7	Trymbaka Murthy (2007), Computer Aided Engineering Drawing, I.K. International Publishers, New Delhi.
8	R.B. Choudary (2005), Engineering graphics with Auto CAD, Anuradha Publishers, New Delhi

T/R	BOOK TITLE SUGGESTED BY FACULTY
1	Harwinder Singh, Engineering Drawing and Computer Graphics , Dhanpat Rai Publishing Co.
2	R.K Dhawan, Text Book of Engineering Drawing, S Chand Publication.

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:

Chalk & Talk
Small Group Instruction.
Making real world connections
Presentatons

E- content used:

https://archive.nptel.ac.in/courses/112/102/112102304/

Additional topics:

1. Intersection of Surfaces/Solids
   Purpose of intersection of surfaces, Intersection between the two cylinder, two prisms, prism and pyramid, pyramid and pyramid, cylinder and prism, cone and cylinder, sphere and cylinder etc., use of cutting plane and line method.

2. Development of Surface
   Purpose of development, Parallel line, radial line and triangulation method. Development of prism, cylinder, cone and pyramid surface for both right angled and oblique solids, and development of surface of sphere.

COURSE OBJECTIVES:

1. To understand the basic principles of engineering drawing
2. To have the knowledge of generating the pictorial views
3. To understand the development of surfaces
4. Use CAD tools for making drawings of machine components and assemblies.
5. To have the knowledge of interpretation of dimensions of different quadrant projections.

.**COURSE PRE-REQUISITES:**

C.CODE	COURSE NAME	DESCRIPTION	SEM

COURSE OUTCOMES:

S.NO	DESCRIPTION	Bloom's Level (B.L)
CO1	Prepare and **understand** drawings	B.L -1
CO2	**Use** the principles of orthographic projections.	B.L -3
CO3	By studying about projections of solids, students will be **able to visualize** three dimensional objects and that will **enable** them to design new products.	B.L-2 B.L -3
CO4	**Design and fabricate** surfaces of different shapes.	B.L- 6
CO5	**Apply** Computer-aided design (CAD) software to modeling of parts and assemblies, dimensions, and annotations to drawing.	B.L -3
CO6	**Represent** and **create** the objects in three dimensional appearances.	B.L -1 B.L -6

PROGRAME SPECIFIC OUTCOMES:

S.NO	DESCRIPTION
PSO1	Graduates will be able to specify structure and breakdown frameworks that productively create, transmit, appropriate and use electrical force.
PSO2	Graduates will be able to apply present day programming devices for plan, recreation and investigation of electrical frameworks to participate in long lasting learning and to effectively adjust in multi-disciplinary situations.
PSO3	Graduates will be able to generate, effective transmission and dissemination of electric power with unique reference to non-conventional and sustainable power source assets.

CO –PO-PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	1	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-	1	-	-
CO3	-	3	3	3	-	-	-	-	-	-	-	3	1	1	-
CO4	-	-	2	-	-	-	-	-	-	2	-	-	-	-	1
CO5	-	-	-	-	-	-	-	-	3	3	-	3	-	-	1
CO6	-	-	-	-	3	-	-	-	-	-	-	3	-	-	1

Prepared by   Approved By

                                                        HOD

ENGINEERING GRAPHICS AND DESIGN

COURSE INFORMATION SHEET

PROGRAMME: ELECTRONICS & COMMUNICATION ENGINEERING	DEGREE: BTECH
COURSE: ENGINEERING GRAPHICS AND DESIGN (THEORY & LAB)	SEMESTER: 1 CREDITS: 3
COURSECODE:BTME101-21 REGULATION: 2021	COURSE TYPE: CORE
COURSE AREA/DOMAIN: ENGINEERING DRAWING	CONTACT HOURS: 1(L) + 5(P) hours/Week.

SYLLABUS:

UNIT	DETAILS	HOURS
I	**INTRODUCTION TO ENGINEERING DRAWING:** Principles of engineering drawing / engineering graphics / technical drawing and their significance – Drawing Instruments: their Standard and uses – symbols and conventions in drawing practice – lettering & numbering – BIS conventions. Types of lines and their uses, Drawing Sheets: sizes and layout, methods of folding drawing sheet, Grades of pencils used, Dimensioning: definition, types and methods of dimensioning, geometrical construction, concept of scales in drawing, types of scales, construction of plane and diagonal scales	18
II	**ORTHOGRAPHIC PROJECTIONS:** Relevance of projection, Types of projections, Principles of orthographic projections in reference to quadrants – conventions – first and third angle projections, illustration through simple problems of projection; Projections of points in quadrants. Projections and trace of a line with different possible orientations in a quadrant. Methods to find true length and inclination of a line with principal planes.	12
III	**PROJECTIONS OF PLANES AND SOLIDS:** Concept of plane and lamina, Projections of a lamina when; parallel to any reference plane, perpendicular to any reference plane, inclined to reference plane. Traces of planes. Definition of solid, types of solids – conventions-different possible orientations of solid in a quadrant. Projections of solid when; axis parallel to reference plane, perpendicular to reference plane, inclined to one and parallel to other reference plane, parallel to both horizontal and vertical planes.	18
IV	**ISOMETRIC PROJECTIONS:** Principles of Isometric Projections-Isometric Scale- Isometric Views or drawing- Conventions. Isometric drawing / projections of solids such as cube, prisms, pyramids, cylinder, and cone.	12
V	**Practice using Computer Aided Drafting (CAD) tools:** Hands on training on any CAD software to strengthen the understanding of the engineering drawing wherein the students will be introduced to a number of assignments as mentioned in the syllabus.	12

TEXT/REFERENCE BOOKS:

S.NO	BOOK TITLE/AUTHORS/PUBLICATION
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8	R.B. Choudary (2005), Engineering graphics with Auto CAD, Anuradha Publishers, New Delhi

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2	R.K Dhawan, Text Book of Engineering Drawing, S Chand Publication.

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:

Chalk & Talk
Small Group Instruction.
Making real world connections
Presentatons

E- content used:

https://archive.nptel.ac.in/courses/112/102/112102304/

Additional topics:

1. Intersection of Surfaces/Solids
   Purpose of intersection of surfaces, Intersection between the two cylinder, two prisms, prism and pyramid, pyramid and pyramid, cylinder and prism, cone and cylinder, sphere and cylinder etc., use of cutting plane and line method.

2. Development of Surface
   Purpose of development, Parallel line, radial line and triangulation method. Development of prism, cylinder, cone and pyramid surface for both right angled and oblique solids, and development of surface of sphere.

COURSE OBJECTIVES:

1. To understand the basic principles of engineering drawing
2. To have the knowledge of generating the pictorial views
3. To understand the development of surfaces
4. Use CAD tools for making drawings of machine components and assemblies.
5. To have the knowledge of interpretation of dimensions of different quadrant projections.

.**COURSE PRE-REQUISITES:**

C.CODE	COURSE NAME	DESCRIPTION	SEM

COURSE OUTCOMES:

S.NO	DESCRIPTION	Bloom's Level (B.L)
CO1	Prepare and **understand** drawings	B.L -1
CO2	**Use** the principles of orthographic projections.	B.L -3
CO3	By studying about projections of solids, students will be **able to visualize** three dimensional objects and that will **enable** them to design new products.	B.L-2 B.L -3
CO4	**Design and fabricate** surfaces of different shapes.	B.L- 6
CO5	**Apply** Computer-aided design (CAD) software to modeling of parts and assemblies, dimensions, and annotations to drawing.	B.L -3
CO6	**Represent** and **create** the objects in three dimensional appearances.	B.L -1 B.L -6

PROGRAME SPECIFIC OUTCOMES:

S.NO	DESCRIPTION
PSO1	Ability to solve complex Electronics and Communication Engineering problems using latest hardware and software tools along with analytical skills to contribute to useful and eco-friendly solutions.
PSO2	Create, develop and disseminate new knowledge to meet the challenges of the future with a firm foundation of the both the theory and practice of Electronics and Communication Engineering at undergraduate levels.

CO –PO-PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	1	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-	1	1
CO3	-	3	3	3	-	-	-	-	-	-	-	3	-	-
CO4	-	-	2	-	-	-	-	-	-	2	-	-	-	-
CO5	-	-	-	-	-	-	-	-	3	3	-	3	1	1
CO6	-	-	-	-	3	-	-	-	-	-	-	3	-	1

Prepared by   Approved By

                                                                   HOD

ENGINEERING GRAPHICS AND DESIGN

COURSE INFORMATION SHEET

PROGRAMME: FOOD TECHNOLOGY	**DEGREE: BTECH**
COURSE: ENGINEERING GRAPHICS AND DESIGN (THEORY & LAB)	**SEMESTER: 1 CREDITS: 3**
COURSECODE:BTME101-21 **REGULATION: 2021**	**COURSE TYPE: CORE**
COURSE AREA/DOMAIN: ENGINEERING DRAWING	**CONTACT HOURS: 1(L) + 5(P) hours/Week.**

SYLLABUS:

UNIT	DETAILS	HOURS
I	**INTRODUCTION TO ENGINEERING DRAWING**: Principles of engineering drawing / engineering graphics / technical drawing and their significance – Drawing Instruments: their Standard and uses – symbols and conventions in drawing practice – lettering & numbering – BIS conventions. Types of lines and their uses, Drawing Sheets: sizes and layout, methods of folding drawing sheet, Grades of pencils used, Dimensioning: definition, types and methods of dimensioning, geometrical construction, concept of scales in drawing, types of scales, construction of plane and diagonal scales	18
II	**ORTHOGRAPHIC PROJECTIONS:** Relevance of projection, Types of projections, Principles of orthographic projections in reference to quadrants – conventions – first and third angle projections, illustration through simple problems of projection; Projections of points in quadrants. Projections and trace of a line with different possible orientations in a quadrant. Methods to find true length and inclination of a line with principal planes.	12
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IV	**ISOMETRIC PROJECTIONS:** Principles of Isometric Projections-Isometric Scale- Isometric Views or drawing- Conventions. Isometric drawing / projections of solids such as cube, prisms, pyramids, cylinder, and cone.	12
V	**Practice using Computer Aided Drafting (CAD) tools**:	12

| | Hands on training on any CAD software to strengthen the understanding of the engineering drawing wherein the students will be introduced to a number of assignments as mentioned in the syllabus. | |

TEXT/REFERENCE BOOKS:

S.NO	BOOK TITLE/AUTHORS/PUBLICATION
1	Engineering Drawing- Basant Agarwal, TMH
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T/R	BOOK TITLE SUGGESTED BY FACULTY
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2	R.K Dhawan, Text Book of Engineering Drawing, S Chand Publication.

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:

Chalk & Talk
Small Group Instruction.
Making real world connections
Presentatons

E- content used:

https://archive.nptel.ac.in/courses/112/102/112102304/

Additional topics:

1. Intersection of Surfaces/Solids
　　Purpose of intersection of surfaces, Intersection between the two cylinder, two prisms, prism and pyramid, pyramid and pyramid, cylinder and prism, cone and cylinder, sphere and cylinder etc., use of cutting plane and line method.

2. Development of Surface
　　Purpose of development, Parallel line, radial line and triangulation method. Development of prism, cylinder, cone and pyramid surface for both right angled and oblique solids, and development of surface of sphere.

COURSE OBJECTIVES:

1. To understand the basic principles of engineering drawing
2. To have the knowledge of generating the pictorial views
3. To understand the development of surfaces
4. Use CAD tools for making drawings of machine components and assemblies.
5. To have the knowledge of interpretation of dimensions of different quadrant projections.

.**COURSE PRE-REQUISITES:**

C.CODE	COURSE NAME	DESCRIPTION	SEM

COURSE OUTCOMES:

S.NO	DESCRIPTION	Bloom's Level (B.L)
CO1	Prepare and **understand** drawings	B.L -1
CO2	**Use** the principles of orthographic projections.	B.L -3
CO3	By studying about projections of solids, students will be **able to visualize** three dimensional objects and that will **enable** them to design new products.	B.L-2 B.L -3
CO4	**Design and fabricate** surfaces of different shapes.	B.L- 6
CO5	**Apply** Computer-aided design (CAD) software to modeling of parts and assemblies, dimensions, and annotations to drawing.	B.L -3
CO6	**Represent** and **create** the objects in three dimensional appearances.	B.L -1 B.L -6

PROGRAME SPECIFIC OUTCOMES:

S.NO	DESCRIPTION
PSO1	Graduate will be able to analyze and formulate ways to process, preserve, and package or store food, according to industrial requirements.
PSO2	Graduates will be able to produce tools and techniques for new or value added products in the area of Food Technology.

CO –PO-PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	1
CO2	3	3	-	-	-	-	-	-	-	-	-	-	-	1
CO3	-	3	3	3	-	-	-	-	-	-	-	3	-	-
CO4	-	-	2	-	-	-	-	-	-	2	-	-	-	1
CO5	-	-	-	-	-	-	-	-	3	3	-	3	-	-
CO6	-	-	-	-	3	-	-	-	-	-	-	3	-	1

Prepared by   Approved By

                                                              HOD

ENGINEERING GRAPHICS AND DESIGN

PROGRAMME: CIVIL ENGINEERING	DEGREE: BTECH
COURSE: ENGINEERING GRAPHICS AND DESIGN (THEORY & LAB)	SEMESTER: 1 CREDITS: 3
COURSECODE:BTME101-21 REGULATION: 2021	COURSE TYPE: CORE
COURSE AREA/DOMAIN: ENGINEERING DRAWING	CONTACT HOURS: 1(L) + 5(P) hours/Week.

SYLLABUS:

UNIT	DETAILS	HOURS
I	**INTRODUCTION TO ENGINEERING DRAWING:** Principles of engineering drawing / engineering graphics / technical drawing and their significance – Drawing Instruments: their Standard and uses – symbols and conventions in drawing practice – lettering & numbering – BIS conventions. Types of lines and their uses, Drawing Sheets: sizes and layout, methods of folding drawing sheet, Grades of pencils used, Dimensioning: definition, types and methods of dimensioning, geometrical construction, concept of scales in drawing, types of scales, construction of plane and diagonal scales	18
II	**ORTHOGRAPHIC PROJECTIONS:** Relevance of projection, Types of projections, Principles of orthographic projections in reference to quadrants – conventions – first and third angle projections, illustration through simple problems of projection; Projections of points in quadrants. Projections and trace of a line with different possible orientations in a quadrant. Methods to find true length and inclination of a line with principal planes.	12
III	**PROJECTIONS OF PLANES AND SOLIDS:** Concept of plane and lamina, Projections of a lamina when; parallel to any reference plane, perpendicular to any reference plane, inclined to reference plane. Traces of planes. Definition of solid, types of solids – conventions-different possible orientations of solid in a quadrant. Projections of solid when; axis parallel to reference plane, perpendicular to reference plane, inclined to one and parallel to other reference plane, parallel to both horizontal and vertical planes.	18
IV	**ISOMETRIC PROJECTIONS:** Principles of Isometric Projections-Isometric Scale- Isometric Views or drawing- Conventions. Isometric drawing / projections of solids such as cube, prisms, pyramids, cylinder, and cone.	12
V	**Practice using Computer Aided Drafting (CAD) tools:** Hands on training on any CAD software to strengthen the understanding of the engineering drawing wherein the students will be introduced to a number of	12

	assignments as mentioned in the syllabus.	

TEXT/REFERENCE BOOKS:

S.NO	BOOK TITLE/AUTHORS/PUBLICATION
1	Engineering Drawing- Basant Agarwal, TMH
2	D. M. Kulkarni, A. P. Rastogi, and A. K. Sarkar (2009), Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi.
3	P.S Gill, "Engineering Drawing", S K Kataria and sons, 18th edition, 2017 reprint
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8	R.B. Choudary (2005), Engineering graphics with Auto CAD, Anuradha Publishers, New Delhi

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DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:

Chalk & Talk
Small Group Instruction.
Making real world connections
Presentatons

E- content used:

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Additional topics:

1. Intersection of Surfaces/Solids
　　Purpose of intersection of surfaces, Intersection between the two cylinder, two prisms, prism and pyramid, pyramid and pyramid, cylinder and prism, cone and cylinder, sphere and cylinder etc., use of cutting plane and line method.

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　　Purpose of development, Parallel line, radial line and triangulation method. Development of prism, cylinder, cone and pyramid surface for both right angled and oblique solids, and development of surface of sphere.

COURSE OBJECTIVES:

1. To understand the basic principles of engineering drawing
2. To have the knowledge of generating the pictorial views
3. To understand the development of surfaces
4. Use CAD tools for making drawings of machine components and assemblies.
5. To have the knowledge of interpretation of dimensions of different quadrant projections.

.COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM

COURSE OUTCOMES:

S.NO	DESCRIPTION	Bloom's Level (B.L)
CO1	Prepare and **understand** drawings	B.L -1
CO2	**Use** the principles of orthographic projections.	B.L -3
CO3	By studying about projections of solids, students will be **able to visualize** three dimensional objects and that will **enable** them to design new products.	B.L-2 B.L -3
CO4	**Design and fabricate** surfaces of different shapes.	B.L- 6
CO5	**Apply** Computer-aided design (CAD) software to modeling of parts and assemblies, dimensions, and annotations to drawing.	B.L -3
CO6	**Represent** and **create** the objects in three dimensional appearances.	B.L -1 B.L -6

PROGRAME SPECIFIC OUTCOMES:

S.NO	DESCRIPTION
PSO1	To develop and apply innovative, state-of-the-art practices and technologies and provide sustainable solutions to the civil engineering problems
PSO2	To plan, design and construct the various structural elements so as to complete the civil engineering project within specified time and funds.

CO –PO-PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	1	1
CO2	3	3	-	-	-	-	-	-	-	-	-	-	1	1
CO3	-	3	3	3	-	-	-	-	-	-	-	3	1	2
CO4	-	-	2	-	-	-	-	-	-	2	-	-	1	2
CO5	-	-	-	-	-	-	-	-	3	3	-	3	2	2
CO6	-	-	-	-	3	-	-	-	-	-	-	3	1	2

ENGINEERING GRAPHICS AND DESIGN

COURSE INFORMATION SHEET

PROGRAMME: INFORMATION TECHNOLOGY	DEGREE: BTECH
COURSE: ENGINEERING GRAPHICS AND DESIGN (THEORY & LAB)	SEMESTER: 1 CREDITS: 3
COURSECODE:BTME101-21 REGULATION: 2021	COURSE TYPE: CORE
COURSE AREA/DOMAIN: ENGINEERING DRAWING	CONTACT HOURS: 1(L) + 5(P) hours/Week.

SYLLABUS:

UNIT	DETAILS	HOURS
I	**INTRODUCTION TO ENGINEERING DRAWING:** Principles of engineering drawing / engineering graphics / technical drawing and their significance – Drawing Instruments: their Standard and uses – symbols and conventions in drawing practice – lettering & numbering – BIS conventions. Types of lines and their uses, Drawing Sheets: sizes and layout, methods of folding drawing sheet, Grades of pencils used, Dimensioning: definition, types and methods of dimensioning, geometrical construction, concept of scales in drawing, types of scales, construction of plane and diagonal scales	18
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4	Jolhe, Dhananjay (2006), Engineering Drawing: With an Introduction to CAD, Tata Mc Graw Hi India.
5	N. D. Bhat (2006), Engineering Drawing, Charotar Publications, New Delhi
6	Venugopal (2010), Engineering Drawing and Graphics, 2nd edition, New Age Publications, New
7	Trymbaka Murthy (2007), Computer Aided Engineering Drawing, I.K. International Publishers, Delhi.
8	R.B. Choudary (2005), Engineering graphics with Auto CAD, Anuradha Publishers, New Delhi

T/R	BOOK TITLE SUGGESTED BY FACULTY
1	Harwinder Singh, Engineering Drawing and Computer Graphics , Dhanpat Rai Publishing Co
2	R.K Dhawan, Text Book of Engineering Drawing, S Chand Publication.

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:

Chalk & Talk
Small Group Instruction.
Making real world connections
Presentatons

E- content used:

https://archive.nptel.ac.in/courses/112/102/112102304/

Additional topics:

1. Intersection of Surfaces/Solids

Purpose of intersection of surfaces, Intersection between the two cylinder, two prisms, prism and pyramid, pyramid and pyramid, cylinder and prism, cone and cylinder, sphere and cylinder etc., use of cutting plane and line method.

2. Development of Surface

Purpose of development, Parallel line, radial line and triangulation method. Development of prism, cylinder, cone and pyramid surface for both right angled and oblique solids, and development of surface of sphere.

COURSE OBJECTIVES:

1. To understand the basic principles of engineering drawing

2. To have the knowledge of generating the pictorial views

3. To understand the development of surfaces

4. Use CAD tools for making drawings of machine components and assemblies.

5. To have the knowledge of interpretation of dimensions of different quadrant projections.

.**COURSE PRE-REQUISITES:**

C.CODE	COURSE NAME	DESCRIPTION	S

COURSE OUTCOMES:

S.NO	DESCRIPTION	Bloom's L (B.L)
CO1	Prepare and **understand** drawings	B.L -1
CO2	**Use** the principles of orthographic projections.	B.L -3
CO3	By studying about projections of solids, students will be **able to visualize** three dimensional objects and that will **enable** them to design new products.	B.L-2 B.L -3
CO4	**Design and fabricate** surfaces of different shapes.	B.L- 6
CO5	**Apply** Computer-aided design (CAD) software to modeling of parts and assemblies, dimensions, and annotations to drawing.	B.L -3
CO6	**Represent** and **create** the objects in three dimensional appearances.	B.L -1 B.L -6

PROGRAME SPECIFIC OUTCOMES:

S.NO	DESCRIPTION
PSO1	
PSO2	

CO –PO-PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PS
CO1	3	-	-	-	-	-	-	-	-	-	-	-		

CO2	3	3	-	-	-	-	-	-	-	-	-		
CO3	-	3	3	3	-	-	-	-	-	-	3		
CO4	-	-	2	-	-	-	-	-	2	-	-		
CO5	-	-	-	-	-	-	-	3	3	-	3		
CO6	-	-	-	3	-	-	-	-	-	-	3		

INDEX

B.TECH 2ND SEMESTER
(Mechanical Engineering)

IK Gujral Punjab Technical University Bachelor of Technology Scheme for B.Tech Syllabus 2018

Slot	Course No.	Subject	L-T-P	Hours	Credits
A.	BTCH101-18	Chemistry-I	3-1-0	4	4
B.	BTCH102-18	Chemistry-I (Lab)	0-0-3	3	1.5
C.	BTAM203-18	Maths-II	4-1-0	4	4
D.	BTPS101-18	Programming for Problem Solving	3-0-0	3	3
E.	BTPS102-18	Programming for Problem Solving (Lab)	0-0-4	4	2
F.	BTMP101-18	Workshop / Manufacturing Practices	1-0-4	5	3
G.	BTHU101-18	English	2-0-0	2	2
H.	BTHU102-18	English (Lab)	0-0-2	2	1
I.	BMPD201-18	Mentoring and Professional Development	0-0-2	2	Noncredit

Total Credits = 20.5 Hours: 29

BTCH101-18 Chemistry-I

PROGRAMME: ENGINEERING	DEGREE: B.TECH
COURSE- CHEMISTRY-I	SEMESTER-2 CREDITS-4
COURSE CODE- BTCH101-18 Year of introduction – 2018	COURSE TYPE – CORE
COURSE AREA/DOMAIN- CHEMISTRY	CONTACT HOURS: 3-1-0
CORRESPONDING LAB COURSE CODE (IF ANY): BTCH102-18	LAB COURSE NAME: CHEMISTRY-I LAB

SYLLABUS:

MODULE	DETAILS	HOURS
I	**Atomic and molecular structure** Schrodinger equation. Particle in a box solutions and their applications for conjugated molecules and nano particles. Forms of the hydrogen atom wave functions and the plots of these functions to explore their spatial variations. Molecular orbitals of diatomic molecules and plots of the multicenter orbitals. Equations for atomic and molecular orbital's. Energy level diagrams of diatomic. Pi-molecular orbitals of butadiene and benzene and aromaticity. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.	12
II	**Spectroscopic techniques and applications** Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules. Applications. Nuclear magnetic resonance and magnetic resonance imaging, surface characterisation techniques. Diffraction and scattering.	8
III	**Intermolecular forces and potential energy surfaces** Ionic, dipolar and van Der Waals interactions. Equations of state of real gases and critical phenomena. Potential energy surfaces of H_3, H_2F and HCN and trajectories on these surfaces.	4
IV	**Use of free energy in chemical equilibria** Thermodynamic functions: energy, entropy and free energy. Estimations of entropy and free energies. Free energy and emf. Cell potentials, the Nernst equation and applications. Acid base, oxidation reduction and solubility equilibria. Water chemistry. Corrosion.Use of free energy considerations in metallurgy through Ellingham diagrams.	6
V	**Periodic properties** Effective nuclear charge, penetration of orbitals, variations of s, p, d and f orbital energies of atoms in the periodic table, electronic configurations, atomic and ionic sizes,ionization energies, electron affinity and electronegativity, polarizability, oxidation states, coordination numbers and geometries, hard soft acids and bases, molecular geometries	4
VI	**Stereochemistry** Representations of 3 dimensional structures, structural isomers and stereoisomers, configurations and symmetry and chirality, enantiomers, diastereomers, optical activity, absolute configurations and conformational analysis. Isomerism in transitional metal compounds	4
VII	**Organic reactions and synthesis of a drug molecule** Introduction to reactions involving substitution, addition, elimination, oxidation, reduction,cyclization and ring openings. Synthesis of a commonly used drug molecule.	4

TEXT/REFERENCE BOOKS:

S.No.	BOOK TITLE/AUTHORS/PUBLICATION
1.	University chemistry, by B. H. Mahan.
2.	Chemistry: Principles and Applications, by M. J. Sienko and R.A. Plane.
3.	Fundamentals of Molecular Spectroscopy, by C. N. Banwell.
4.	Physical Chemistry, by P. W. Atkins.
5.	Organic Chemistry: Structure and Function by K. P. C. Volhardt and N. E. Schore, 5thEdition http://bcs.whfreeman.com/vollhardtschore5e/default.asp.

	BOOK TITLE SUGGESTED BY FACULTY
1	Conceptual Engineering Chemistry by Dr. S.K. Bhasin Ajay Publications

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:
Chalk & Talk
PPTs
Group Discussions

E- content used:
https://youtu.be/5RlvRCjLT4Y

Additional topics:
Woodward rules for conjugated dienes and α, β- unsaturated carbonyl groups.
Application of Schrodinger wave equation to Harmonic oscillator and rigid rotor.

Course Objectives

The aim and objective of the course on Chemistry-I is to introduce the students of B. Tech. class to the formal structure of Chemistry-I so that they can use these in Engineering as per their requirement.

Course: CHEMISTRY-I	
Subject Code- BTCH101-18	
Course Outcomes	**BT Level**
1. Illustrate the structures of diatomic and polyatomic in terms of molecular orbital's and relate intermolecular forces.	2
2. Interpret the molecular interactions by choosing suitable spectroscopic methods and interpreting corresponding data.	2
3. Make use of free energy in chemical equilibria and relate intermolecular forces.	3
4. Analyze periodic properties such as ionization potential, electro negativity, oxidation states and electro negativity	4
5. Determine the stereochemistry of organic compounds and major chemical reactions that are used in the synthesis of molecules.	5
6. Formulate the reactivity/stability of compound and identification of drug molecule.	6

CO mapping with PO, PSO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1												1		1
CO2	2	2	1									1	1	1
CO3												1		
CO4	2	2	1									1	1	1
CO5												1		
CO6												1		1

BTCH102-18 CHEMISTRY-I LAB

COURSE INFORMATION SHEET

PROGRAMME: ENGINEERING	DEGREE: B.TECH
COURSE- CHEMISTRY-I LAB	SEMESTER-2 CREDITS-1.5
COURSE CODE- BTCH102-18 Year of introduction - 2018	COURSE TYPE – CORE
COURSE AREA/DOMAIN- CHEMISTRY	CONTACT HOURS: 0-0-3
CORRESPONDING LAB COURSE CODE (IF ANY): NIL	LAB COURSE NAME: NIL

SYLLABUS:

Choice of 10-12 Experiments from the following:

1. Determination of surface tension and viscosity
2. Thin Layer Chromatography
3. Ion exchange column for removal of hardness of water
4. Colligative properties using freezing point depression
5. Determination of the rate constant of a reaction
6. Determination of cell constant and conductance of solutions
7. Potentiometry-determination of redox potentials and emf
8. Synthesis of a polymer/drug
9. Saponification/acid value of an oil
10. Chemical analysis of a salt
11. Lattice structures and packing of spheres
12. Models of potential energy surfaces
13. Chemical oscillations- Iodine clock reaction
14. Determination of the partition coefficient of a substance between two immiscible liquids
15. Adsorption of acetic acid by charcoal
16. Use of the capillary viscometers to the demonstrate of the isoelectric point as the pH ofminimum viscosity for gelatin sols and/or coagulation of the white part of egg.

TTEXT/REFERENCE BOOKS:

S.No	BOOK TITLE/AUTHORS/PUBLICATION
1.	**Vogel A-I, Quantitative Inorganic Analysis, Oxford ELBS**

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:
Chalk & Talk
PPTs
Group Discussions
Lab Performance

E- content used:
https://youtu.be/ukjRtZVBkx8
Additional topics:
Synthesis of tris(ethylenediamine)nickel(II) dichloride, [Ni(en)3]Cl2, and estimation of Ni(II).
To prepare Adipic acid from cyclohexanone.

COURSE OBJECTIVE:
The aim and objective of the Lab course on Chemistry-I Lab is to introduce the students of B.Tech. class to the formal structure of Chemistry-I so that they can use these in Engineering as per their requirement.

Course: CHEMISTRY-I LAB	
Subject Code- BTCH102-18	
Course Outcomes	**BT Level**
1. Classify different physical properties such as surface tension and viscosity of unknown liquids.	2
2. Build skills in method of creating different chromatographic techniques.	3
3. Make use of the rate constants, cell constant, redox potentials and conductance for different chemical solutions.	3
4. Survey basic techniques and procedures in laboratory for synthesis and purification of any organic compounds	4
5. Inspect acid value of oil and analysis of salt.	4
6. Measure the partition coefficient of substance and adsorption of acetic acid by different methods.	5

CO mapping with PO, PSO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	

CO1											1		
CO2	2	1	1								1		
CO3	2	1	1								1	1	
CO4											1		
CO5											1		
CO6											1		

Total Credits = 20.5 Hours: 29

COURSE INFORMATION SHEET

PROGRAMME: ENGINEERING	DEGREE: B.TECH
COURSE- CHEMISTRY-I	SEMESTER-2 CREDITS-4
COURSE CODE- BTCH101-18 Year of introduction – 2018	COURSE TYPE – CORE
COURSE AREA/DOMAIN- CHEMISTRY	CONTACT HOURS: 3-1-0
CORRESPONDING LAB COURSE CODE (IF ANY): BTCH102-18	LAB COURSE NAME: CHEMISTRY-I LAB

SYLLABUS:

MODULE	DETAILS	HOURS
I	**Atomic and molecular structure** Schrodinger equation. Particle in a box solutions and their applications for conjugated molecules and nano particles. Forms of the hydrogen atom wave functions and the plots of these functions to explore their spatial variations. Molecular orbitals of diatomic molecules and plots of the multicenter orbitals. Equations for atomic and molecular orbital's. Energy level diagrams of diatomic. Pi-molecular orbitals of butadiene and benzene and aromaticity. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.	12
II	**Spectroscopic techniques and applications** Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules. Applications. Nuclear magnetic resonance and magnetic resonance imaging, surface characterisation techniques. Diffraction and scattering.	8
III	**Intermolecular forces and potential energy surfaces** Ionic, dipolar and van Der Waals interactions. Equations of state of real gases and critical phenomena. Potential energy surfaces of H_3, H_2F and HCN and trajectories on these surfaces.	4
IV	**Use of free energy in chemical equilibria** Thermodynamic functions: energy, entropy and free energy. Estimations of entropy and free energies. Free energy and emf. Cell potentials, the Nernst equation and applications. Acid base, oxidation reduction and solubility equilibria. Water chemistry. Corrosion.Use of free energy considerations in metallurgy through Ellingham diagrams.	6
V	**Periodic properties** Effective nuclear charge, penetration of orbitals, variations of s, p, d and f orbital energies of atoms in the periodic table, electronic configurations, atomic and ionic sizes,ionization energies, electron affinity and electronegativity, polarizability, oxidation states, coordination numbers and geometries, hard soft acids and bases, molecular geometries	4

VI	**Stereochemistry** Representations of 3 dimensional structures, structural isomers and stereoisomers, configurations and symmetry and chirality, enantiomers, diastereomers, optical activity, absolute configurations and conformational analysis. Isomerism in transitional metal compounds	4
VII	**Organic reactions and synthesis of a drug molecule** Introduction to reactions involving substitution, addition, elimination, oxidation, reduction,cyclization and ring openings. Synthesis of a commonly used drug molecule.	4

Total hours – 42

TEXT/REFERENCE BOOKS:

S.No.	BOOK TITLE/AUTHORS/PUBLICATION
1.	University chemistry, by B. H. Mahan.
2.	Chemistry: Principles and Applications, by M. J. Sienko and R.A. Plane.
3.	Fundamentals of Molecular Spectroscopy, by C. N. Banwell.
4.	Physical Chemistry, by P. W. Atkins.
5.	Organic Chemistry: Structure and Function by K. P. C. Volhardt and N. E. Schore, 5thEdition http://bcs.whfreeman.com/vollhardtschore5e/default.asp.

	BOOK TITLE SUGGESTED BY FACULTY
1	Conceptual Engineering Chemistry by Dr. S.K. Bhasin Ajay Publications

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:
Chalk & Talk
PPTs
Group Discussions

E- content used:
https://youtu.be/5RlvRCjLT4Y

Additional topics:
Woodward rules for conjugated dienes and α, β- unsaturated carbonyl groups.
Application of Schrodinger wave equation to Harmonic oscillator and rigid rotor.

Course Objectives

The aim and objective of the course on Chemistry-I is to introduce the students of B. Tech. class to the formal structure of Chemistry-I so that they can use these in Engineering as per their requirement.

Course: CHEMISTRY-I		
Subject Code- BTCH101-18		
	Course Outcomes	**BT Level**
7.	Illustrate the structures of diatomic and polyatomic in terms of molecular orbital's and relate intermolecular forces.	2
8.	Interpret the molecular interactions by choosing suitable spectroscopic methods and interpreting corresponding data.	2
9.	Make use of free energy in chemical equilibria and relate intermolecular forces.	3
10.	Analyze periodic properties such as ionization potential, electro negativity, oxidation states and electro negativity	4
11.	Determine the stereochemistry of organic compounds and major chemical reactions that are used in the synthesis of molecules.	5
12.	Formulate the reactivity/stability of compound and identification of drug molecule.	6

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1												1		1
CO2	2	2	1									1	1	1
CO3												1		
CO4	2	2	1									1	1	1
CO5												1		
CO6												1		1

CO mapping with PO, PSO

BTCH102-18 CHEMISTRY-I LAB

COURSE INFORMATION SHEET

PROGRAMME: ENGINEERING	DEGREE: B.TECH
COURSE- CHEMISTRY-I LAB	SEMESTER-2 CREDITS-1.5
COURSE CODE- BTCH102-18 Year of introduction - 2018	COURSE TYPE – CORE
COURSE AREA/DOMAIN- CHEMISTRY	CONTACT HOURS: 0-0-3
CORRESPONDING LAB COURSE CODE (IF ANY): NIL	LAB COURSE NAME: NIL

SYLLABUS:

Choice of 10-12 Experiments from the following:

17. Determination of surface tension and viscosity
18. Thin Layer Chromatography
19. Ion exchange column for removal of hardness of water
20. Colligative properties using freezing point depression
21. Determination of the rate constant of a reaction
22. Determination of cell constant and conductance of solutions
23. Potentiometry-determination of redox potentials and emf
24. Synthesis of a polymer/drug
25. Saponification/acid value of an oil
26. Chemical analysis of a salt
27. Lattice structures and packing of spheres
28. Models of potential energy surfaces
29. Chemical oscillations- Iodine clock reaction
30. Determination of the partition coefficient of a substance between two immiscible liquids
31. Adsorption of acetic acid by charcoal
32. Use of the capillary viscometers to the demonstrate of the isoelectric point as the pH ofminimum viscosity for gelatin sols and/or coagulation of the white part of egg.

TTEXT/REFERENCE BOOKS:

S.No	BOOK TITLE/AUTHORS/PUBLICATION
1.	**Vogel A-I, Quantitative Inorganic Analysis, Oxford ELBS**

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:
Chalk & Talk
PPTs
Group Discussions
Lab Performance

E- content used:
https://youtu.be/ukjRtZVBkx8
Additional topics:
Synthesis of tris(ethylenediamine)nickel(II) dichloride, [Ni(en)3]Cl2, and estimation of Ni(II).
To prepare Adipic acid from cyclohexanone.

COURSE OBJECTIVE:

The aim and objective of the Lab course on Chemistry-I Lab is to introduce the students of B.Tech. class to the formal structure of Chemistry-I so that they can use these in Engineering as per their requirement.

Course: CHEMISTRY-I LAB	
Subject Code- BTCH102-18	

	Course Outcomes	BT Level
7.	Classify different physical properties such as surface tension and viscosity of unknown liquids.	2
8.	Build skills in method of creating different chromatographic techniques.	3
9.	Make use of the rate constants, cell constant, redox potentials and conductance for different chemical solutions.	3
10.	Survey basic techniques and procedures in laboratory for synthesis and purification of any organic compounds	4
11.	Inspect acid value of oil and analysis of salt.	4
12.	Measure the partition coefficient of substance and adsorption of acetic acid by different methods.	5

CO mapping with PO, PSO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	P
CO1												1		
CO2	2	1	1									1		
CO3	2	1	1									1		
CO4												1		
CO5												1		
CO6												1		

MATHEMATICS –II

COURSE INFORMATION SHEET

PROGRAMME: ENGINEERING	DEGREE: B.TECH
COURSE- MATHEMATICS PAPER-II	SEMESTER-2 CREDITS-5
COURSE CODE- BTAM203 -18 Year of introduction - 2021	COURSE TYPE - CORE
COURSE AREA/DOMAIN- MATHEMATICS	CONTACT HOURS: 4-1-0
CORRESPONDING LAB COURSE CODE (IF ANY): NIL	LAB COURSE NAME: NA

SYLLABUS:

MODULE	DETAILS	HOURS
I	**Ordinary differential equations:First Order** First OrderExact, linear and Bernoulli's equations, Euler's equation, Equations not of first degree:equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.	12
II	**Ordinary differential equations: Higher orders** Second order linear differential equations with variable coefficients, method of variation of parameters, Cauchy-Euler equation;Power series solutions.	13
III	**Complex Variable – Differentiation** Elementary functions of complex variables, limit, continuity and differentiability; CauchyRiemann equations, analytic functions, harmonic functions, finding harmonic conjugate; elementary analytic functions (exponential, trigonometric, logarithm) and their properties;Conformal mappings, Mobius transformation and its properties.	10
IV	**Complex Variable – Integration** Contour integrals, Cauchy-Goursat theorem (without proof), Cauchy Integral formula (without proof), Liouville's theorem and Maximum-Modulus theorem (without proof); Taylor's series, zeros of analytic functions, singularities, Laurent's series; Residues, Cauchy Residue theorem (without proof), Evaluation of definite integral involving sine and cosine,	15

Total hours – 50

TEXT/REFERENCE BOOKS:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
1.	G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition,Pearson, Reprint, 2002.
2.	Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006. .
3.	S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.
4.	E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall India, 1995.
5.	E. L. Ince, Ordinary Differential Equations, Dover Publications, 1958.

T/R	BOOK TITLE SUGGESTED BY FACULTY
1	J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7thEd., Mc-Graw Hill, 2004.
2	Ordinary and Partial differential equation by Jetandra Rattan.

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:

- Chalk & Talk
- Small Group Instruction.
- Making real world connections
- Inquiry-based Learning

E- CONTENT USED:

https://youtu.be/CCMnwZHcW6w
https://youtu.be/XSUjmDrYjzI

ADDITIONAL TOPICS:

- Linear Equations with Regular Singular Points
- Existence and Uniqueness of Solution to First Order Equations

Course Objective:

The objective of this course is to familiarize the prospective engineers with techniques in calculus, Ordinary differential equations and Complex analysis. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

COURSE OUTCOMES

Course: MATHEMATICS PAPER-II		
Course Code: BTAM203-18		
	Course Outcomes	BT LEVE
BTAM203-18.1	Understand the concept of existence and uniqueness of solutions	2
BTAM203-18.2	Summarize the second order differential equation.	2
BTAM203-18.3	Illustrate the ODE with the help of variation of parameter.	2
BTAM203-18.4	Justify the differentiability of functions.	5
BTAM203-18.5	Evaluate different integral involving cosine and sine function.	5
BTAM203-18.6	Discuss conformal mapping and Lioville's theorem.	6

	Po1	Po2	Po3	Po4	Po5	Po6	Po7	Po8	Po9	Po10	Po11	Po12	Pso1	Pso
Co1	2		1	1		1	1							1
Co2	2	2				2		2				2		
Co3	3	1	2	2			1			1			1	
Co4	3			1	2									1
Co5	3		3	2					2				1	
Co6	2											1	1	

PROGRAMME: ENGINEERING	DEGREE: B.TECH
COURSE:PPS	SEMESTER-2 CREDITS-3
COURSE CODE- BTPS101-18 Year of Introduction - 2018	COURSE TYPE – CORE
COURSE AREA/DOMAIN- PPS	CONTACT HOURS:3-0-0
CORRESPONDING LAB COURSE CODE (IF ANY): BTPS102-18	LAB COURSE NAME: ENGLISH- LAB

BTPS101-18 COURSE INFORMATION SHEET

SYLLABUS

MODULE	DETAILS	HOURS
1.	Introduction to Programming, Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.) Idea of Algorithm: steps to solve logical and numerical problems. Representation of algorithm Flowchart/ Pseudo code with examples. Syntax and logical errors in compilation	8
2.	Introduction about constants, variables, data types, operators, precedence and expressions. Evaluation of conditional Branching and loops	14
3.	1-D and 2-D Arrays, Character Array and strings.	6
4.	Searching, Sorting algorithms (Bubble, insertion and selection) quick sort and merge sort.	6
5.	Functions, Parameter passing in functions, call by value and call by reference, passing array to functions.	6
6.	Recursion Recursion, as a different pointers, Use of Pointers in self-referential structures, notion of linked list	5
7.	Defining structures and Array of structures	4
8.	Idea of pointers ,Use of pointers in structure.	2
6.	Introduction, File reading/writing in different modes	3

Total hours –52
TEXT/REFERENCE BOOKS:

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:

- Chalk & Talk

- Small Group Instruction.

- Making real world connections

- Presentations
  E- CONTENT USED:
  https://www.youtube.com/watch?v=8PopR3x-VMY
  https://www.youtube.com/watch?v=3lqgdqoY83o
  https://www.youtube.com/watch?v=08LWytp6PNI

S.No	BOOK TITLE/AUTHORS/PUBLICATION
1.	"The Programming Language" ,Braian W. Kernighan and Desnnis M. Ritchie.
2.	"Let Us C",By Yashwant Kanetkar, Saurav Kulkarni.
3.	"C Programming Language", A step by step beginners guide to learn C programming by Darel L Graham.
4.	"Programming in C", by Reema Thareja
5.	."C in Depth",by Deepali Srivastava and S K Srivastava.
6.	Computer Programming using C language – Vipan Arora, Eagle's Publications.

ADDITIONAL TOPICS:

- Object Oriented Programming Concepts
- Use of Class in OOPS
- Use of Inhertance
- Introduction about N/w Security
- Introduction about Web Technology

COURSE OBJECTIVES

T   The aim and objective of the course on English is to introduce the students of B. Tech. class to the formal structure of English so   that they can use these in Engineering as per their requirement.

<table>
<tr><td colspan="3" align="center">Course: PPS</td></tr>
<tr><td colspan="3" align="center">Subject Code- BTPS101-18</td></tr>
<tr><td></td><td>Course Outcomes</td><td>BT Level</td></tr>
<tr><td>1.</td><td>Explore the working of program development, characteristics of C, compilation process, Flowchart and it's working.</td><td>1</td></tr>
<tr><td>2.</td><td>Explain the use of different data types, operators, expressions, Input / Output statements, Library Functions.</td><td>2</td></tr>
<tr><td>3.</td><td>Run programs based on control statements like if-else, if-else-if, for loop, while loop, do-while loop, Switch statement and break statement.</td><td>3</td></tr>
<tr><td>4.</td><td>Identify the use of functions (Call by value, call by reference), parameter passing in functions, Passing array to functions, Categorize sorting algorithms (Bubble, Insertion and Selection)</td><td>4</td></tr>
<tr><td>5.</td><td>Order of complexity through Programs, Use of array (1-d Array & 2-d Array), Relate the use of structures, Array of structures, Use of pointer in C</td><td>4</td></tr>
<tr><td>6.</td><td>Describe Strings, reading & writing strings, standard library string functions, Study of reading from a file, writing to a file, structure of file program, Error handling in file and command line arguments in file.</td><td>6</td></tr>
</table>

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1		1							2	1	1
CO2	2	1	1									1		1
CO3	3	1	2									2		
CO4	1	2	1	1							2	2	2	1
CO5	1	2	1									1	1	1
CO6	2	1	1	1										

BTPS102-18

COURSE INFORMATION SHEET

List Of Practicals:

PROGRAMME: ENGINEERING	DEGREE: B.TECH
COURSE:PPS Lab	SEMESTER-2 CREDITS-2
COURSE CODE- BTPS102-18 Year of Introduction - 2018	COURSE TYPE - CORE
COURSE AREA/DOMAIN- PPS	CONTACT HOURS:0-0-4
CORRESPONDING LAB COURSE CODE (IF ANY): NA	

S.No	DETAILS	HOURS
1.	Familiarization with programming environment	3
2.	Simple computational problems using arithmetic expressions	4
3.	Problems involving if-then-else structures.	2
4.	Iterative Problems	1
5.	1D Array manipulation	2
6.	Matrix problems, String operations	2
7.	Simple functions	1
8.	Pointers and structures	2
6.	File handling	3

TEXT/REFERENCE BOOKS:

S.No	BOOK TITLE/AUTHORS/PUBLICATION
1.	"The Programming Language" ,Braian W. Kernighan and Desnnis M. Ritchie.
2.	"Let Us C",By Yashwant Kanetkar, Saurav Kulkarni.
3.	"C Programming Language", A step by step beginners guide to learn C programming by Darel L Graham.
4.	"Programming in C", by Reema Thareja
5.	."C in Depth",by Deepali Srivastava and S K Srivastava.
6.	Computer Programming using C language – Vipan Arora, Eagle's Publications.

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:

- Chalk & Talk
- Small Group Instruction.
- Making real world connections
- Presentations

E- CONTENT'

https://youtu.be/GIqcZXtqh_U
https://youtu.be/dQa4A2Z0_Ro

ADDITIONAL TOPIC

- Basic programs of OOPS
- Program of class in C++

- Practical work related to network security

Course Objectives

T   The aim and objective of the course on English is to introduce the students of B. Tech. class to the formal structure of English so   that they can use these in Engineering as per their requirement.

Course: PPS lab		
Subject Code- BTPS102-18		
	Course Outcomes	**BT Level**
1.	Familiarization with programming environment	1
2.	Simple computational problems using arithmetic expressions	2
3.	Problems involving if-then-else structures, 1D Array manipulation	3
4.	Matrix problems, String operations	4
5.	Simple functions	4
6.	Pointers and structures, File handling	6

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2	1	1								2	1	1
CO2	2	1-			3		2			1		1		2
C03	1			2	2		3					3	2	1
C04	3		3	2	2						3	2		2
CO5	2	3		2	2							3	3	2
CO6	2		3		3		1				1	1		2

BTHU101-18 ENGLISH

COURSE INFORMATION SHEET

PROGRAMME: ENGINEERING	DEGREE: B.TECH
COURSE:ENGLISH	SEMESTER-2 CREDITS-4
COURSE CODE- BTHU101-18 Year of introduction – 2018	COURSE TYPE - CORE
COURSE AREA/DOMAIN- ENGLISH	CONTACT HOURS: 3-1-0
CORRESPONDING LAB COURSE CODE (IF ANY): BTHU102-18	LAB COURSE NAME: ENGLISH- LAB

SYLLABUS:

MODULE	DETAILS	HOURS
I	**Vocabulary Building & Basic Writing Skills** The concept of Word Formation • Root words from foreign languages and their use in English • Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives. Synonyms, antonyms, and standard abbreviations. • Sentence Structures • Use of phrases and clauses in sentences • Importance of proper punctuation • Creating coherence • Organizing principles of paragraphs in documents • Techniques for writing precisely Suggested Readings: .	4

II	**Identifying Common Errors in Writing** Subject-verb agreement • Noun-pronoun agreement • Misplaced modifiers • Articles • Prepositions • Redundancies • Clichés	6
III	**Mechanics of Writing** Writing introduction and conclusion • Describing • Defining • Classifying • Providing examples or evidence	4
IV	**Writing Practices** Comprehension • Précis Writing • Essay Writing • Business Writing-Business letters, Business Emails, Report Writing, Resume/CV	4

Total hours – 42

TEXT/REFERENCE BOOKS:

S.No	BOOK TITLE/AUTHORS/PUBLICATION
1.	Practical English Usage. Michael Swan. OUP. 1995.
2.	Remedial English Grammar. F.T. Wood. Macmillan.2007
3.	On Writing Well. William Zinsser. Harper Resource Book. 2001
4.	Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006
5.	Communication Skills. Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.
6.	Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

	BOOK TITLE SUGGESTED BY FACULTY
1	Oxford modern English grammar by B. Aarts
2	English Grammar by Michael swan

DELIVERY/INSTRUCTIONAL METHODOLOGIES/ TEACHING PEDAGOGY:
Chalk & Talk
Group Discussion.
Projector
Presentations

E- content used:
https://www.youtube.com/watch?v=zfbUzWqsH74

Course Objectives

The aim and objective of the course on English is to introduce the students of B. Tech. class to the formal structure of English so that they can use these in Engineering as per their requirement.

Course: ENGLISH		
Subject Code- BTHU-101-18		
	Course Outcomes	**BT Level**
CO1	Choose basic proficiency in listening and speaking skills.	1
CO2	Interpret the independent user of English language.	2
CO3	Make use of communication training.	3
CO4	Discover different strategy of effective communication and select the most appropriate mode of communication for a given situation.	4
CO5	Distinguish effectively and assertively.	4
CO6	Combine effectively through different mode of written communication.	6

COPO Mapping

CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1.	2	2		3				2		3		2			
2.	1	3		2		1			2	2					
3.			3			2		2	3	3		2			
4.	1	3				2			1	2		1			
5.	2					3			2	1	3	2			
6.	3		2	2				1	1			2			