		. (I.T., EXT Chemical)	C, Mechanical	, Semo	ester: I	
Course/Mod	lule: M	athematics-	I	Mod	ule Code: MBIT010 MBME01 MBCH01	1001, MBCO01001,
	Tea	ching Schei	me		Evaluatio	on Scheme
Classroom Session	Lecture (Hours per week)	Tutorial (Hours per week)	Practical/ Group work (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks - 100 in Question Paper)
45	3	1	0	4	Marks Scaled to 50	Marks Scaled to 50

Course Rationale:

This course aims at providing adequate exposure to the theory and applications of Calculus and Linear Algebra; It also aims to gradually develop in students an ability to apply these theoretical constructs to solve problems within Engineering domain. This course covers Integration of single variable functions and its applications, Differential calculus of single and multivariable functions, Matrix Algebra, Vector Spaces, Linear Transformation and Eigen value problems.

Course Objectives:

- To instill in prospective engineers knowledge of techniques in calculus, multivariate analysis and linear algebra.
- 2. To equip the students with intermediate to advanced level concepts and aligned tools to help them tackle advanced mathematics and related applications.

Course Outcomes:

After completion of the course, students would be able to:

- 1. Implement appropriate techniques of Differential and Integral Calculus to solve problems.
- Demonstrate understanding of the fundamental concepts of Linear Algebra and carry out related computational skills.
- 3. Analyse functions, matrices and systems of linear equations.
- 4. Apply Calculus techniques and Algebraic skills to solve real life problems.

Pedagogy:

Lectures, tutorials, presentations, application-based videos, use of mathematical software.

Textbooks:

- TB1. Linear Algebra: A Modern Introduction, 3 e, D. Poole, Brooks/Cole, 2010.
- TB2. Higher Engineering Mathematics, 1 e, B.V. Ramana, McGraw Hill Education, 2017.
- TB3. Higher Engineering Mathematics, 44 e, B.S. Grewal, Khanna Publishers, 2017.

Reference Books:

- RB1. Calculus, 13 e, G. B. Thomas, Pearson 2014.
- RB2. Engineering Mathematics- I, 1 e, Veerarajan T, McGraw-Hill Education, 2016.
- RB3. Advanced Engineering Mathematics, 10 e, Erwin Kreyszig, Wiley India, 2017.





Links to websites: http://mathworld.wolfram.com http://www.math.com https://ocw.mit.edu/index.htm Evaluation Scheme: Tutorial Test/Presentation/viva/quiz 30% Mid Term 20% Term End Exam 50% Total 100%

Session Plan:

Session	Topics	Pedagogical Tool	Textbook Chapters & Readings	
Unit 1:	Integral Calculus			
1.	Evaluation of definite and improper integrals Definite integrals (Revision) Improper Integrals of type I	Lectures Problem Solving	TB2: Chapter 6: Integral Calculus	
2.	 Evaluation of definite and improper integrals Improper Integrals of type II Improper Integrals of type III 			
3.	Beta, Gamma functions and their Properties Introduction to Gamma function Evaluation of integrals using Gamma function		TB2: Chapter 11: Special Functions- Gamma, Beta Bessel and Legendre	
4.	Beta, Gamma functions and their Properties Introduction to Beta function Relation between Beta and Gamma functions Properties of Beta function			
5.	Beta, Gamma functions and their Properties • evaluation of integrals using Beta function			
6.	Applications of definite integrals to evaluate surface areas and volumes of revolutions. • Surface area	Lectures Playing of animation	TB2: Chapter 6: Integral Calculus	



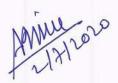


7.	Applications of definite integrals to evaluate surface areas and volumes of revolutions. • Volume of revolution	video • Problem Solving	TB3: Chapter 6: Integration and its applications
Unit 2:	Differential Calculus		
8.	Mean value theorems Rolle's Mean value theorem Lagrange's Mean value theorem	 Lectures Problem Solving Online tools for graphs 	TB2: Chapter 2: Differential Calculus TB3: Chapter 4: Differentiation
9.	Mean value theorems, Taylor's theorem with remainder Cauchy's Mean value theorem Expanding functions using Taylor's theorem	Lectures Problem Solving	and Its Applications
10.	Taylor's and Maclaurin theorems with remainders Taylor's expansion with remainder Maclaurin series expansion with remainder		
11.	Maclaurin theorem with remainders Maclaurin series expansion with remainder (continuation)		
12.	Indeterminate forms and L'Hospital's rule • Indeterminate forms $\frac{0}{0}, \frac{\infty}{\infty}, 0 \times \infty$		
13.	Indeterminate forms and L'Hospital's rule • Indeterminate forms $\infty - \infty, 0^0, \infty^0, 1^\infty$		
14.	Maxima and minima Maxima and minima of one variable functions		TB3: Chapter 4: Differentiation and Its Applications
Unit 3:	Multivariable Differential Calculus		
15.	Limit and continuity Limit and continuity of multivariable functions	 Lectures Problem Solving Online tools Example: web.monroecc.edu/ calcNSF/ 	TB2: Chapter 3: Partial Differentiation TB3: Chapter 5: Partial Differentiation and its





		(exploring multivariable calculus)	Applications
16.	 Partial derivatives Introduction to Partial Derivatives First and Second order Partial Derivatives of functions 	 Lectures Problem Solving Online tools Example: web.monroecc.edu/ calcNSF/ (exploring multivariable calculus) 	
17.	Partial derivatives • Chain rule	LecturesProblem Solving	
18.	Gradient, directional derivatives • Gradient and its geometrical interpretation • Directional derivative	Lectures Problem Solving Online tools web.monroecc.edu/calcNSF/ (exploring multivariable calculus) Mathlets from https://ocw.mit.edu	TB2: Chapter 15: Vector Differential Calculus TB3: Chapter 8: Vector Calculus
20.	Directional derivatives, total derivative • Properties of directional derivative • Total derivative Tangent plane and normal line	 Lectures Problem Solving Online tools from 	
	Tangent plane and normal line of surfaces	web.monroecc. edu/calcNSF/ (exploring multivariable calculus)	
21.	Maxima, minima and saddle points Second derivative test for Maxima, minima and saddle points of two variable functions.	 Lectures Problem Solving Online tools from 	TB2: Chapter 4: Maxima Minima TB3: Chapter 5: Partial





		web.monroecc.edu/ calcNSF/ (exploring multivariable calculus)	Differentiation and its Applications
22.	Method of Lagrange multipliers Method of Lagrange multipliers for constrained maxima and minima	 Lectures Problem Solving Mathlets from https://ocw.mit. edu 	
23.	 curl and divergence curl and divergence solenoidal and irrotational vector field 	 Lectures Problem Solving Mathlets from https://ocw.mit.edu 	TB2: Chapter 15: Vector Differential Calculus TB3: Chapter 8: Vector Calculus
Unit 4:	Vector Spaces and Linear Transformation		
24.	Vector spaces • Definition and Examples of Vector Spaces Vector spaces	Lectures Problem Solving	TB1: Chapter 3: Matrices Chapter 6: Vector spaces
26.	Subspace of a Vector Space and examples Linear independence of Vectors,		
20.	 Elinear independence of Vectors, Basis, Dimension Test of independence and dependence of vectors Basis of a Vector Space and Dimension 		
27.	Basis, Dimension Basis and dimension of vector spaces and subspaces		
28.	Linear transformations, Matrix associated with a linear map Definition and examples of Linear Transformation Matrix associated with a linear map		

SVKM'S Noting Member 56

29.	Matrix associated with a linear map		
	Matrix associated with a linear map (continuation)		
	one-one correspondence between Linear Transformation and Matrices		
30.	Range and Kernal of a linear map, rank, nullity		
	Determining Range and Kernal of a Linear map		
	Determining rank and nullity		
31.	Rank-nullity theorem		
	Composition of linear maps		
	rank-nullity theorem		
	Composition of linear maps	1	
32.	Inverse of a linear transformation	1	
	Inverse of a linear transformation		
	Matrix associated with the inverse of Linear Transformation		
Unit 5:	Eigen Values and Vectors	-	
33.	Determinant, Inverse	• Lectures	TB3:
	Determinant (Revision)	• Problem	Chapter 2: Linear Algebra:
	Inverse by adjoint method	Solving	Determinants, matrices
34.	Rank of matrix		
	Rank of matrix by Echelon form		
35.	Rank of matrix		
	Rank of matrix by minor method		
36.	System of linear equations		TB1:
	solving systems of linear equations		Chapter 2: System of Linear Equations
37.	System of linear equations		TB3:
	 solving systems of linear equations (continuation) 		Chapter 2: Linear Algebra: Determinants, matrices
38.	Eigenvalues and eigenvectors	Lectures	TB1:
	Introduction to Eigenvalues and eigenvectors	Problem Solving	Chapter 4: Eigen values Eigen vectors
	 Finding Eigenvalues and 	Applet from	TB2:
	eigenvectors of matrices	https://ocw.mit.	Chapter 14: Eigen Values





39.	 Eigenvalues and eigenvectors For symmetric matrices For skew symmetric matrices 	LecturesProblem Solving	TB3: Chapter 2: Linear Algebra: Determinant, matrices
40.	Eigenvalues and eigenvectors For orthogonal matrices	Discussion of real life examples	
41.	 Diagonalization of matrices Testing if a matrix is diagonalizable Finding the transforming matrix and diagonal matrix 		
42.	Verification and application of Cayley-Hamilton Theorem	Lectures Problem Solving	
43, 44, 45	Beyond classroom activities; including activities.	remedial lectures, gues	tt lectures and other extension

Signature

(Prepared by Concerned Faculty/HOD)

Signature

(Approved by Dean)



	MBA. Tech. (I Computer, Cl		Iechanical,	Semester:	I	
Course/Moo	dule: Program Solving	mming for Pro	oblem	Module C	ode: MBIT01002 MBME0100 MBCH01002	2, MBCO01002,
Teaching Scheme				Evaluation	on Scheme	
Classroom Session	Lecture (Hours per week)	Tutorial (Hours per week)	Practical/ Group work (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks - 100 in Question Paper)
45	3	0	4	5	Marks Scaled to 50	Marks Scaled to 50

Course Rationale:

This course aims to teach the fundamental concepts of Procedural Programming. Students will develop skills related to problem solving by writing computer programs. This course does not require any prior programming experience.

Course Objectives:

- Enable students understand the basic concepts of Programming and help them build Programming Logic.
- 2. Develop problem solving skills using basic Programming constructs, Decision Making and Looping.
- 3. Enable students solve complex problems using the knowledge of Arrays, Functions, Structures and Pointers.

Course Outcomes:

After completion of the course, students would be able to:

- 1. To formulate algorithms and draw flowcharts for arithmetic and logical problems.
- 2. To implement Decision Making, Nested Control Structures and Iterations.
- 3. To implement programs using Functions and concept of Recursion.
- 4. To implement programs using arrays, strings, structure, pointers, searching and sorting algorithms.

Pedagogy:

Peer learning, Group exercises, quizzes, presentations and lecture method

Textbooks:

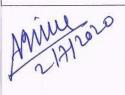
TB1. Schaum's Outline Programming with C, 3 e, Byron Gottfried, McGraw-Hill, 2017.

TB2. Programming in ANSI C, 7 e, E. Balaguruswamy, Tata McGraw Hill Education, 2017.

Reference Books:

RB1. The C Programming Language, 2 e, Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall of India, 1988.

RB2. Schaum's Outlines Data Structures, Revised 1 e, Seymour Lipschutz, Tata McGraw Hill, 2014.





Links to websites: https://cprogramming codes.blogspot.in/2011/09/algorithms- and-flow chart.html**Evaluation Scheme:** Tutorial Test/Presentation/viva/quiz 30% Mid Term 20% Term End Exam 50% Total 100%

Session Plan:

Session	Topics	Pedagogical Tool	Textbook Chapters & Readings	
Unit 1	Introduction to Programming	=	alox	
1.	Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.)	Lectures	TB1: Chapter 1: Introductory Concepts	
2.	 Idea of Algorithm: Steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/Pseudo code with examples 		TB1: Chapter 1: Introductory Concepts	
3.	Source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code		TB1: Chapter 2: Introduction to C programming TB2: Chapter 1: Overview of C Chapter 2: Constants variables and data types	
Unit 2	Basic Programming Constructs	-	-	
4.	Operators	• Lectures	TB1, TB2:	
5.	Expressions	 Presentations Quizzes	Chapter 3: Operators and expressions	
6.	Decision making and Branching: • If statements and if else statement	· ·	TB1: Chapter 5: Control	
7.	Nesting of if else statements and Else if ladder		Statements TB2:	
8.	Switch statements		Chapter 5: Decision	
9.	Continue statement Break statement		making and branching	





10.	Looping - while		TB1:
11.	do-while		Chapter 6: Control
12.	For loops		Statements
13.	For loops and Finding roots of equations		TB2: Chapter 6: Decision
14.	Nested loops		making and looping
Unit 3	Arrays and Strings		-
15.	Concept, declaration, initialization	• Lectures	TB1:
	Accessing array elements of one- dimensional array	Problem Solving	Chapter 9: Arrays TB2:
16.	One-dimensional array	Quizzes	Chapter 7: Arrays
17.	Concept, declaration, initialization		
	Accessing array elements of two- dimensional array		a sind in
18.	Two - dimensional array		
19.	Introduction to strings		
Unit 4	Functions	-	
20.	Function	• Lectures	TB1:
	 Introduction and need of user defined functions 	Problem Solving	Chapter 7: Functions TB2:
21.	Defining a Function	Quizzes	Chapter 9: User defined
	Function calls and declaration	102	functions
22.	Category of functions:		
	No argument and no return value		
	Argument but no return value		
23.	Category of functions:		
	Argument with return value		
	No argument but return value		
24.	Passing arrays to functions		TB1:
25.	Declaring & initialising string variable, Reading & writing strings		Chapter 9: Arrays TB2:
26.	String handling functions		Chapter 9: User defined functions, Character
27.	Passing strings to functions		arrays and strings
			The second secon
Unit 5	Recursion		· ·
	Recursion Introduction to Recursion	• Lectures	TB1:





29.	Recursion programs:	Solving	TB2:	
	 Examples - Finding Factorial, Fibonacci series 	Presentation	Chapter 9: User defined functions	
30.	Recursion programs:		idilotions	
	• Examples GCD, Merge sort.			
Unit 6	Structures			
31.	 Defining a Structure Declaring structure variables Accessing structure members Structure Initialization 	LecturesProblem SolvingQuizzes	TB1: Chapter 11: Structure and unions TB2:	
32.	Array of Structure	Presentation	Chapter 10: Structure and	
33.	Structure within structure		unions	
34.	Difference between Structure and Unions			
Unit 7	Pointers			
35.	Idea of pointers	• Lectures	TB1:	
	Defining pointers	• Problem	Chapter 10: Pointers	
36.	Call by value and call by reference	Solving • Quizzes	TB2: Chapter 11: Pointers	
37.	Use of Pointers in self-referential structures, Notion of linked list (no implementation)	Presentation	TB1: Chapter 11: Structure and unions TB2: Chapter 13: Dynamic memory allocation and linked	
Unit 8	Basic Algorithms			
38.	Notion of order of complexity through example programs (no formal definition required	LecturesProblemSolving		
39.	Searching: Sequential search	Quizzes		
40.	Basic Sorting Algorithms : Bubble sort	 Presentation 	RB2:	
41.	Insertion sort		Chapter 9: Sorting and	
12.	Selection sort		searching	
13, 14,45	Beyond classroom activities; including remactivities.	edial lectures, guest le	ectures and other extension	

Signature

(Prepared by Concerned Facalty)

Signature

(Approved by Dean)

Program: MBA. Tech. (I.T., EXTC, Mechanical, Computer, Chemical)

Medulo Codo: MBET01003 MDET01003

Course/Module: Chemistry

Module Code: MBIT01003, MBET01003, MBC001003, MBC001003, MBCH01003

Teaching Scheme				Evalua	tion Scheme	
Classroom Session	Lecture (Hours per week)	Tutorial (Hours per week)	Practical/ Group work (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks - 100 in Question Paper)
45	3	1	2	5	Marks Scaled to 50	Marks Scaled to 50

Course Rationale:

This course is intended to provide essential concepts in Chemistry. The contents have covered fundamentals of chemistry required for students to apply the subject knowledge in engineering and technological applications.

Course Objectives:

- 1. Understand periodicity of elements and bonding and reactivity of various molecules.
- 2. Apply techniques to interpret molecular structure and chemical reactions.
- 3. Analyze thermodynamic, electrochemical and stereo-chemical parameters of molecules.
- 4. Evaluate concepts of chemistry for engineering applications.

Course Outcomes:

After completion of the course, students would be able to:

- 1. Understand periodicity of elements and bonding and reactivity of various molecules.
- 2. Apply techniques to interpret molecular structure and chemical reactions.
- 3. Analyze thermodynamic, electrochemical and stereo-chemical parameters of molecules.
- 4. Evaluate concepts of chemistry for engineering applications.

Pedagogy:

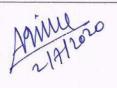
Experimental learning activities, presentations and lecture method.

Textbook:

- TB1. General Chemistry: Principles & Modern applications, 7 e, William Harwood, Ralph Petrucci, Prentice Hall Publication 2007.
- TB2. University Chemistry, 4e, Bruce H. Mahan, Benjamin/Cummings Publishing, 2009.
- TB3. Principles of Organic Synthesis, 3 e, Richard Oswald Chandler Norman, Springer, 2014.
- TB4. Principles of Instrumental Analysis, 7e, Douglas A. Skoog, James F. Holler & Stanley R. Crouch, Cengage Learning, 2017.

Reference Books:

- RB1. Advanced Inorganic Chemistry, 6e, Frank A. Cotton & Gefforey Wilkinson, Wiley Eastern Ltd., 2007.
- RB2. Organic Chemistry, 5 e, Stanley H. Pine, Tata McGraw Hill, 2008.
- RB3. Organic Chemistry, 10e, Graham T. W. Solomons & Craig B, Fryhle, John Wiley, 2009.





RB4. Physical Chemistry, 9e, Peter. W. Atkins, ELBS/Oxford, 2010.

RB5. March's Advanced Organic Chemistry: Reactions, Mechanisms and Structure, 7e, Michael B. Smith, John Wiley, 2013.

Links to websites:

A. Websites

- https://chem.libretexts.org/
- http://www.spectroscopynow.com/view/index.html
- http://www.organic-chemistry.org/namedreactions/
- www.nptel.ac.in

B. YouTube Videos

- Chemistry Tutorial: Atomic Structure meets the Periodic Table, Atomic School, 2013 (URL: https://youtu.be/3 FJIpKgdV4)
- Molecular Shape and Orbital Hybridization, René Van Wyk, 2012 (URL: (https://youtu.be/graDpWX msY)
- What is Wave Particle Duality? Hongyang Dong, 2016 (URL: https://youtu.be/pdaBe4FwYVE)
- Synthesis of Aspirin, NCSSMDDistance Ed, 2011 (URL: https://youtu.be/Y4NMpO1xI8U)
- S_N¹ reaction, University of Surrey, 2011 (URL: https://youtu.be/JmcVgE2WKBE)
- S_N² reaction, University of Surrey, 2011 (URL: https://youtu.be/h5xvaP6bIZI)

Evaluation Scheme:

	Total	100%
•	Term End Exam	50%
•	Mid Term	20%
•	Tutorial Test/Presentation/viva/quiz	30%

Session Plan:

Session	Topics	Pedagogical Tool	Textbook Chapters & Readings
Unit 1	Atomic & Molecular structure	-	
1-2	Atom structure and limitations of Bohr's model	Article Discussion: Lecture method and discussion Advanced Inorganic Chemistry, 6e, Frank A. Cotton & Gefforey Wilkinson, Wiley Eastern Ltd, 2007.	TB1: Chapter 2: Atoms and the Atomic Theory
3-4	Wave particle duality, De Broglie's principle and numerical problems based on it.	Article Discussion: Lecture method and discussion. Class Activity: solving numericals Advanced Inorganic Chemistry, 6e, Frank A.	TB1: Chapter 2: Atoms and the Atomic Theory





		Cotton & Gefforey Wilkinson, Wiley Eastern Ltd, 2007.	
5-6	Schrödinger's wave equation (no derivation). Atomic orbital, shapes of s, p, d, f orbitals.	Article Discussion: Lecture method and discussion Advanced Inorganic Chemistry, 6e, Frank A. Cotton & Gefforey Wilkinson, Wiley Eastern Ltd, 2007.	TB1: Chapter 2: Atoms and the Atomic Theory
7-8	Electronic configuration of atoms and Concept of hybridization (sp, sp ² , sp ³) with one example each	Article Discussion: Lecture method and discussion. Class Activity: revision of periodic table, hybridization Advanced Inorganic Chemistry, 6e, Frank A. Cotton & Gefforey Wilkinson, Wiley Eastern Ltd, 2007.	TB1: Chapter 2: Atoms and the Atomic Theory
Unit 2	Chemical bonding	1.4=	-
9-10	Intermolecular forces: Ionic, covalent, co-ordinate bonds and van Der Waals interactions (with one example for each type).	Article Discussion: Lecture method and discussion. Advanced Inorganic Chemistry, 6e, Frank A. Cotton & Gefforey Wilkinson, Wiley Eastern Ltd, 2007.	TB1: Chapter 10: Chemical Bonding
11-12	Introduction to co-ordination chemistry and Co-ordination number and applications (EDTA as a chelating agent and applications in water chemistry).	Article Discussion: Lecture method and discussion. Class Activity: Numerical solving Advanced Inorganic Chemistry, 6e, Frank A. Cotton & Gefforey Wilkinson, Wiley Eastern Ltd, 2007.	TB1: Chapter 10: Chemical Bonding TB5: Chapter 1: Water treatment
Unit 3	Periodic properties of elements		
13-14	Modern (Bohr) periodic table, Nomenclature of s, p, d, f group elements	Article Discussion: Lecture method and discussion.	TB1: Chapter 10: Chemical Bonding





	Trends in physical properties: effective nuclear charge, atomic radii, ionization energy, electron affinity, electronegativity.	Advanced Inorganic Chemistry, 6e, Frank A. Cotton & Gefforey Wilkinson, Wiley Eastern Ltd, 2007.	
15-16	Metallic character, melting- boiling points (definitions for each property with explanation on trends observed in Modern Periodic table	Article Discussion: Lecture method and discussion. Advanced Inorganic Chemistry, 6e, Frank A. Cotton & Gefforey Wilkinson, Wiley Eastern Ltd, 2007.	TB1: Chapter 10: Chemical Bonding
Unit 4	Stereochemistry	NA COL	-
17	Orientation of organic molecule in three dimension, Fischer projection of lactic acid.	Exercise: Fischer projection of lactic acid.	TB3: Chapter 5: Stereochemistry Chapter 6: The Shapes of Molecules— Stereochemistry
18	Concept of chirality and optical activity (dextro, levo) presentation of lactic acid), Symmetry and configuration in a molecule.	Article Discussion: Lecture method and discussion.	TB3: Chapter 5: Stereochemistry Chapter 6: The Shapes of Molecules— Stereochemistry
19	Types of isomers (structural isomers, stereoisomers, enantiomer and diastereomer)	Article Discussion: Lecture method and discussion.	TB3: Chapter 5: Stereochemistry Chapter 6: The Shapes of Molecules— Stereochemistry
20-21	R-S nomenclature- Cahn-Ingold- Prelog convention, diastereomer of achiral compound (cis-trans) eg: 2-butene.	Activity: Assigning R-S nomenclature to molecule	TB3: Chapter 5: Stereochemistry Chapter 6: The Shapes of Molecules— Stereochemistry
Unit 5	Organic Reactions	-	
22	General organic reactions: Oxidation (Swern oxidation, Oppenauer oxidation).	Activity: Discussion based on Stanley H. Pine, (2008), "Organic Chemistry", Tata McGraw Hill, 5th edition	TB3: Chapter 10: Mechanism of Organic Reactions



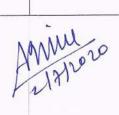


23	Reduction (Meerwein-Ponndorf- Verley Reduction, Bechamp reduction).	Activity: Discussion based on Stanley H. Pine, (2008), "Organic Chemistry", Tata McGraw Hill, 5th edition	TB3: Chapter 10: Mechanism of Organic Reactions
24	Amide and ester bond formation (condensation reactions) with one example	Activity: Illustration based on T. W. Graham Solomons, (2009), "Organic Chemistry", John Wiley, 10 th edition	TB3: Chapter 10: Mechanism of Organic Reactions
25	Elimination reactions (E1 with one example). Elimination reactions (E2 with one example).	Activity: Illustration based on T. W. Graham Solomons, (2009), "Organic Chemistry", John Wiley, 10 th edition	TB3: Chapter 10: Mechanism of Organic Reactions
26	Substitution reactions $(S_N^1, S_N^2$ with one example) and	Activity: Discussion based on Stanley H. Pine, (2008), "Organic Chemistry", Tata McGraw Hill, 5th edition	TB3: Chapter 10: Mechanism of Organic Reactions
27	Electrophilic reaction in Friedel Crafts alkylation and acylation.	Activity: Discussion based on R.O.C. Norman, (2014), "Principles of Organic Synthesis", Springer, 3 rd edition	TB3: Chapter 10: Mechanism of Organic Reactions
28	Synthesis of Aspirin	Activity: Discussion based on R.O.C. Norman, (2014), "Principles of Organic Synthesis", Springer, 3 rd edition	TB3: Chapter 10: Mechanism of Organic Reactions
Unit 6	Chemical Thermodynamics and Electrochemistry		
29	Concepts of Internal energy Enthalpy Entropy	Article Discussion: Lecture method and discussion. Physical Chemistry, 9e, Peter. W. Atkins, ELBS/Oxford, 2010.	TB1: Chapter 7: Thermochemistry





30	Concepts of	Article Discussion:	TB1:
	free energy (no derivations)	Lecture method and discussion. Physical Chemistry, 9e, Peter. W. Atkins, ELBS/Oxford, 2010.	Chapter 7: Thermochemistry
31-32	EMF of Cell, Cell potential, Relation of free energy with EMF of cell	Article Discussion: Lecture method and discussion. Physical Chemistry, 9e, Peter. W. Atkins, ELBS/Oxford, 2010.	TB1: Chapter 2: Electrochemistry
33-34 Derivation of Nernst equation Applicability of Nernst equation		Article Discussion: Lecture method and discussion. Physical Chemistry, 9e, Peter. W. Atkins, ELBS/Oxford, 2010.	TB1: Chapter 2: Electrochemistry
35	Theory of Wet corrosion/ Electrochemical corrosion	Article Discussion: Lecture method and discussion. Physical Chemistry, 9e, Peter. W. Atkins, ELBS/Oxford, 2010.	TB1: Chapter 2: Electrochemistry
Unit 7	Spectroscopic techniques and Applications	-	-
36	Basic Principle of Spectroscopy	Article Discussion: Lecture method and discussion.	TB4: Chapter 13: An Introduction to UV/Vis Spectrometry
37-38	General idea on Electromagnetic radiation , UV-Visible Spectroscopy & applications	Article Discussion: Lecture method and discussion.	TB4: Chapter 13: An Introduction to UV/Vis Spectrometry TB4: Chapter 14: Application of UV/Vis/Spectrometry
39-40	General idea on IR Spectroscopy & applications.	Article Discussion: Lecture method and discussion.	TB4: Chapter 16: An Introduction to IR TB4: Chapter 17:





			Application of IR
41	Nuclear magnetic resonance & applications.	Article Discussion: Lecture method and discussion.	TB4: Chapter 19: NMR Spectroscopy
42	MRI applications in medicine.	Article Discussion: Lecture method and discussion.	TB4: Chapter 19: NMR Spectroscopy
43, 14,45	Beyond classroom activities; incluactivities.	uding remedial lectures, gue	est lectures and other extension

Signature

(Prepared by Concerned Faculty/HOD)

Signature

(Approved by Dean)

	IBA. Tech. (I.T computer, Cher	(S)	hanical,	Semester	: I	
Course/Modu	ile: Workshop Practices	p / Manufactu	ring	Module (Code: MBIT01004 MBME0100 MBCH0100	4, MBCO01004,
	Teac	hing Scheme			Evaluatio	on Scheme
Classroom Session	Lecture (Hours per week)	Tutorial (Hours per week)	Practical/ Group work (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE)
15	1	0	4	3	Marks Scaled to 50	

Course Rationale:

Workshop Practice is a basic practical engineering course. Students are able to perform various operations using hand tool equipment and machineries in various shops. Working in workshop develops the attitude of group working and safety awareness. This course provides miniature industrial environment in the educational institute

Course Objectives:

- 1. To impart hands on experience of different workshop practices on various trades.
- 2. To impart knowledge of basic tools used for different workshop jobs.
- 3. To introduce basic concepts of electrical and electronic instruments and its applications

Course Outcomes:

After completion of the course, students would be able to:

- 1. Demonstrate understanding of safety and operation practices in fabrication processes like welding.
- 2. Apply various hand tool operations like fitting and carpentry for the manufacturing.
- 3. Inculcate the fundaments of assembling Electronics and Electrical components.

Pedagogy:

Lectures, Experiential learning activities, Work based learning

Textbooks:

- TB1. Mechanical Workshop Practice, 2nd Edition, K.C. John, PHI Learning Pvt. Ltd., 2014.
- TB2. Manufacturing Technology-Vol I, 4th Edition, P. N. Rao, Tata McGraw Hill, 2014.
- TB3. Printed Circuit Boards: Design, Fabrication, assembly and testing, 1st Edition, R.S. Khandpur, Tata McGraw Hill, 2005.

Reference Books:

- RB1. Manufacturing Processes and Systems, 9th Edition, P.F. Ostwald, John Willy & Sons INC. UK, 2008.
- RB2. *Electrical Workshop: Safety, Commissioning, maintenance and testing of electrical equipment,* 3rd Edition, R.P. Singh, IK International Publishing House Pvt. Ltd., 2012.





Links to websites:

https://www.mycarpentry.com/carpentry-tools.html

• http://www.weldingtypes.net/

Evaluation Scheme:

• Mechanical Workshop:

60%

• Electronics Workshop:

40%

Total:

100%

Session Plan:

Session	Topics	Pedagogical Tool	Textbook Chapters & Readings	
Unit 1	Introduction to Workshop Practices and Processes			
1,	Workshop Processes for Practice and Safety Measures	 Lectures Charts demonstrating safe practise Application- based videos 	TB1: Chapter 2: Workshop Practise and Record Writing	
Unit 2	Manufacturing Methods		-	
2.	Manufacturing Methods	Lectures Application-based videos	TB1: Chapter 1: Workshop Process TB2: Chapter1: Introduction	
3.	Metal Casting & Metal drawing	Lectures Application-based videos	TB1: Chapter 1: Workshop Process TB2: Chapter 3: Metal- Casting Process Chapter 4: Gating system for casting Chapter 5: Melting and casting Quality	
4.	Forming-Rolling, Forging, Extrusion	Lectures Application-based videos	TB1: Chapter 1: Workshop Process TB2: Chapter 1: Introduction	
5.	Welding	 Lectures Application- based videos Preparing job as per specification 	TB1: Chapter 1: Workshop Process & Chapter 4: ARC Welding TB2:	





			Chapter 9: Welding process Chapter 10: Other fabrication process
Unit 3	Machining Methods		
6.	Machining Operations	Lectures Application-based videos	TB1: Chapter 10: Turning
7.	CNC machining	LecturesApplication- based videos	RB1: Chapter 28: Computer Numerical Control Systems
Unit 4	Fitting Operations		
8.	Use and setting of fitting tools for chipping, cutting, filing, Marking, center punching, drilling, tapping.	 Lectures Application- based videos Prepare job as per specification 	TB1: Chapter 3: Fitting
9.	Carpentry- Use and setting of carpentry hand tools like hacksaws, jackplanes, chisels and gauges for construction of various joints.	 Lectures Application-based video Prepare job as per specification 	TB1: Chapter 6: Carpentry
Unit 5	Printed Circuit Boards		
10.	Printed Circuit boards Designing	LecturesDemonstration of tools	TB3: Chapter 1: Basics of Printed Circuit Board
11.	PCB Applications; Manufacturing sequence	 Hands on practice on PCB circuit design with EDA tools. Prepare job as per specification 	TB3: Chapter 1: Basics of Printed Circuit Board
Unit 6	Soldering Techniques		
12.	Introduction to joining processes and soldering	Lectures Prepare job as per specification	TB3: Chapter 13: Soldering, Assembly and Re-working technique
13.	Soldering Techniques and circuit assembly	 Lectures Mounting and installation of electronic circuits, wiring of subassemblies 	TB3: Chapter 2: Electronic Component





		Prepare job as per specification	
Unit 7	Wiring Systems		
14.	Electrical Wiring Systems	 Lectures Experiential learning activities 	RB2: Chapter 13: Electrical Wiring Systems
15.	Beyond classroom activities; inc activities.	luding remedial lectures, gues	t lectures and other extension

Signature

(Prepared by Concerned Faculty/HOD)

Signature

(Approved by Dean)

Program: MBA. Tech. (I.T., EXTC, Mechanical, Computer, Chemical)

Module Code: MBIT01005, MBET01005, MBCO01005, MBME01005, MBCO01005,

MBCH01005

Teaching Scheme				Evaluat	ion Scheme	
Classroom Session	Lecture (Hours per week)	Tutorial (Hours per week)	Practical/ Group work (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks - 100 in Question Paper)
30	2	0	2	3	Marks Scaled to 50	Marks Scaled to 50

Pre-requisite:

Knowledge of Senior Secondary Level English

Course Rationale:

The syllabus aims to develop a sound understanding of the basic concepts of English Language usage. Also, the course prepares the students for developing their interpersonal communication, eventually leading to enhanced employability skills.

Course Objectives:

- 1. To equip students with the knowledge of basic concepts of English language
- 2. To build learners' vocabulary for effective speaking and writing
- 3. To inculcate and strengthen learners' technical writing skills
- 4. To enhance the learners' communication skills for employability through adequate exposure to exercises in reading, writing, listening and speaking

Course Outcomes:

After completion of the course, students would be able to:

- 1. Understand the basic rules governing English with a purpose to apply them effectively, with a substantially increased vocabulary base
- Apply the rules governing English to communicate effectively, professionally and persuasively in professional settings
- 3. Create formal, persuasive and professional written documents and business presentations
- Evaluate and analyze different socio-cultural and professional contexts as per the need of the industry and apply appropriate communication strategies in response to them.

Pedagogy:

Classroom teaching, classroom exercises and discussion, written assignments, practice worksheets, presentations and role play

Textbooks:

TB1. Business Communication Today, 10th Edition, Bovee, Thill and Chaturvedi, Pearson Education, 2011.

TB2. Technical Communication, 3rd Edition, Dr. Meenakshi Raman and Dr. Sangeeta Sharma, Oxford University Press 2015.





TB3. *The McGraw Hill Handbook of English Grammar and Usage*, 1st edition, Lester, Mark and Beason, Larry, McGraw Hill Education 2017.

Reference Books:

RB1. A Practical English Grammar, 4th Edition, 1986 Edition, Thomson and Martinet, Oxford, 1997.

RB2. Oxford Guide to Effective Writing and Speaking, Seely, John, Oxford University Press, 2013.

Links to websites:

- https://www.britishcouncil.in/
- https://www.mindtools.com/

Evaluation Scheme:

	Tutorial Test/Presentation/viva/quiz	30%
•	Mid Term	20%
•	Term End Exam	50%
	Total	100%

Session Plan:

Session	Topics	Pedagogical tool	Textbook Chapters & Readings
Unit 1	Vocabulary Building	-	
1.	The concept of Word Formation	 Classroom Teaching Classroom Exercises Practice worksheets 	TB1: Chapter:(appended) Handbook of Grammar, Chapter:(appended) Mechanics and Usage
2.	Root words from foreign languages and their use in English	 Classroom Teaching Classroom Exercises Practice worksheets 	TB2: Chapter 17: Grammar and Vocabulary Development TB2: Chapter 17:
3.	Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives; Synonyms, antonyms, and standard abbreviations	 Classroom Teaching Classroom Exercises Practice worksheets 	Grammar and Vocabulary Development
Unit 2	Basic Writing Skills		-
4.	Sentence Structures; Use of phrases and clauses in	Classroom Teaching	TB1:





	sentences	• Classro	oom Exercises	Chapter:(appended)
		Practic	e worksheets	Handbook of Grammar
				Chapter:(appended)
				Mechanics and Usage
				TB2:
				Chapter 11:
	, and a few section in the contract of the con			Elements of Effective Writing
5.	Importance of proper	Classro	oom Teaching	TB1:
	punctuation	Classro	oom Exercises	Chapter:(appended)
		Practic	e worksheets	Handbook of Grammar
				Chapter:(appended)
				Mechanics and Usage
				TB2:
				Chapter 11:
				Elements of Effective Writing
6.	Principles of effective writing	Classro	oom Teaching	TB2:
	(including techniques for		oom Exercises	Chapter 11:
	writing precisely)	Practic	ce worksheets	Elements of Effective Writing
		ALEXAGERATIONS	n Assignments	RB2:
		· · · · · · · · · · · · · · · · · · ·	i i i i i i i i i i i i i i i i i i i	Chapter 4:
				The Process of Writing
7.	Organizing principles of	Classro	oom Teaching	TB2:
	paragraphs in documents	Classro	oom Exercises	Chapter 11:
		Practic	ce worksheets	Elements of Effective Writing
		Writter	n Assignments	RB2:
			3	Chapter 4:
				The Process of Writing
Unit 3	Identifying Common Errors in Writing			
8.	Subject-verb agreement	• Classro	oom Teaching	TB1:
		• Classro	oom Exercises	Chapter:(appended)
		Practic	e worksheets	Handbook of Grammar, Chapter:(appended)
				Mechanics and Usage
				TB2:
				Chapter 17:
				Grammar and Vocabulary
				Development
				Development

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			TB3:
			Chapter: Part II-Topic 7
	8		Subject Verb Agreement
9.	Noun-pronoun agreement	 Classroom Teaching Classroom Exercises Practice worksheets 	TB1: Chapter:(appended) Handbook of Grammar, Chapter:(appended) Mechanics and Usage TB2:
			Chapter 17: Grammar and Vocabulary Development
10.	Misplaced modifiers	 Classroom Teaching Classroom Exercises Practice worksheets 	TB3: Chapter: Part II Topic 10 Modification
11.	Articles Prepositions	 Classroom Teaching Classroom Exercises Practice worksheets 	TB1: Chapter:(appended) Handbook of Grammar, Chapter:(appended) Mechanics and Usage TB2: Chapter 17: Grammar and Vocabulary Development RB1: Chapter 1: Articles Chapter 9: Prepositions
12.	Redundancies – words, phrases and usage; Clichés – words, phrases and usage	Classroom TeachingClassroom ExercisesPractice worksheets	TB2: Chapter 11: Elements of Effective Writing
Unit 4	Nature and Style of Sensible Writing		
13.	Describing – technical description of objects,	Classroom TeachingClassroom Exercises	TB2: Chapter 11:

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	processes and instruction	Practice worksheets	Elements of Effective Writing
	writing	Written Assignments	Chapter 16: Research Paper and Technical Descriptions
14.	technical description of processes and instruction writing Defining and Classifying	 Classroom Teaching Classroom Exercises Practice worksheets Written Assignments Classroom Teaching Classroom Exercises Practice worksheets Written Assignments 	TB2: Chapter 11: Elements of Effective Writing Chapter 16: Research Paper and Technical Descriptions TB2: Chapter 11: Elements of Effective Writing Chapter 16: Research Paper and Technical Descriptions
16.	Providing examples or evidence – building an effective argument	 Classroom Teaching Classroom Exercises Practice worksheets Written Assignments 	TB1: Chapter 5: Writing Business Messages Chapter 10: Writing Persuasive Messages TB2: Chapter 11: Elements of Effective Writing
17.	Writing introduction and conclusion	 Classroom Teaching Classroom Exercises Practice worksheets Written Assignments 	TB1: Chapter 5: Writing Business Messages Chapter 10: Writing Persuasive Messages TB2: Chapter 11: Elements of Effective Writing RB2: Chapter 4: The Process of Writing
Unit 5	Writing Practices		-
18.	Comprehension	Classroom Teaching	TB2: Chapter 10:

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an yan san		Classroom ExercisesPractice worksheetsWritten Assignments	Reading Comprehension Chapter 11: Elements of Effective Writing
19.	Précis Writing	 Classroom Teaching Classroom Exercises Practice worksheets Written Assignments 	TB2: Chapter 12: The Art of Condensation
20.	Essay Writing	 Classroom Teaching Classroom Exercise Practice worksheets Written Assignments 	TB2: Chapter 11: Elements of Effective Writing RB2: Chapter 4: The Process of Writing
Unit 6	Oral Communication		
21.	Listening – process of listening, types of listening, barriers to listening	Classroom TeachingListening Exercises	TB2: Chapter 4: Active Listening
22.	Listening – barriers to listening, steps to improve listening skills and listening comprehension	ClassroomTeachingListening Exercises	TB2: Chapter 4: Active Listening
23.	Paralinguistics – Pronunciation, Intonation, Stress (Primary and Secondary) and Rhythm	 Classroom Teaching spoken practice Exercises 	TB2: Chapter 1: Basics of Technical Communication
24.	Common everyday situational conversations	 Classroom Teaching spoken practice Exercises Role plays 	TB2: Chapter 5: Effective Speaking Chapter 6: Conversations and Dialogues
25.	Communication at Workplace – Formal and Informal	 Classroom Teaching Classroom Discussion Written Assignments 	TB1: Chapter 1: Understanding the Foundations of Business Communication TB2: Chapter 1:

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			Basics of Technical Communication
26.	Organizational Barriers to Communication	ClassroomTeachingClassroom DiscussionWritten Assignments	TB2: Chapter 1: Basics of Technical Communication
27.	Interviews – preparation; and effective communication before, during and after an interview (including telephonic interviews)	 Classroom Teaching Mock Interview Role Plays 	TB1: Chapter 18 & 19: Writing Employment Messages and Interviewing for Jobs TB2: Chapter 8: Interviews
28.	Formal Presentations	 Classroom Teaching PPT Presentations Student Practice Presentations 	TB1: Chapter 2: Mastering Team and Interpersonal Communication Chapter 16 & 17: Designing and Delivering Oral and Online Presentations TB2: Chapter 7: Formal Presentations
29, 30	Beyond classroom activities; incactivities.	cluding remedial lectures, gue	est lectures and other extension

Signature

(Prepared by Concerned Faculty/HOD)

Signature

(Approved by Dean)