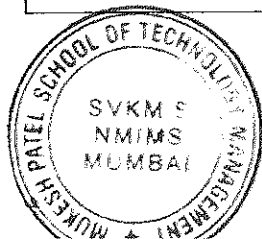# SVKM's Narsee Monjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering
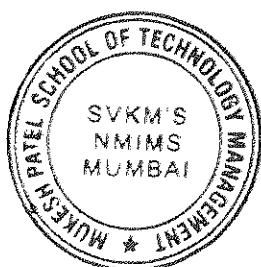
Program: MBA. Tech. (I.T., EXTC, Mechanical, Civil, Computer & Chemical)					Semester: I	
Course/Module: Mathematics-I					Module Code: MBIT01001, MBET01001, MBME01001, MBCI01001, MBCO01001, MBCH01001	
Teaching Scheme					Evaluation Scheme	
Classroom Session	Lecture (Hours per week)	Tutorial (Hours per week)	Practical/ Group work (Hours per week)	Credit	Continuous Evaluation (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:

1. 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.
2. 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.

SVKM's Narsee Monjee Institute of Management Studies
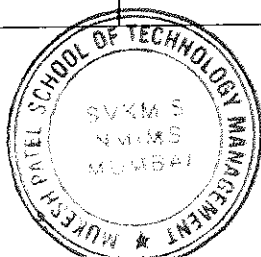## Mukesh Patel School of Technology Management & Engineering

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:

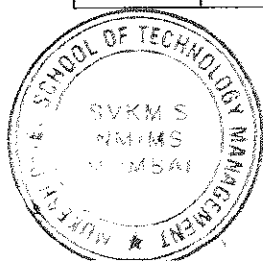| Session	Topics	Pedagogical Tool	Textbook Chapters & Readings
Unit 1:	**Integral Calculus**	--	--
1.	**Evaluation of definite and improper integrals** • Definite integrals (Revision) • Improper Integrals of type I	• Lectures • Problem Solving	**TB2:** Chapter 6: Integral Calculus
2.	**Evaluation of 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 and Its Applications
9.	**Mean value theorems, Taylor's theorem with remainder** • Cauchy's Mean value theorem • Expanding functions using Taylor's theorem	• Lectures • Problem Solving	
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 $\dfrac{0}{0},\dfrac{\infty}{\infty},0\times\infty$		
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	• Lectures • Problem 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
19.	**Directional derivatives, total derivative** • Properties of directional derivative • Total derivative	• Lectures • Problem Solving • Online tools from web.monroecc. edu/calcNSF/ (exploring multivariable calculus)	
20.	**Tangent plane and normal line** • Tangent plane and normal line of surfaces		
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

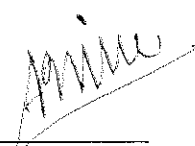|		web.monroecc.edu/calcNSF/ (exploring multivariable calculus)	Differentiation and its Applications
22.	**Method of Lagrange multipliers** • Method of Lagrange multipliers for constrained maxima and minima	• Lectures • Problem Solving • Mathlets from https://ocw.mit.edu	
23.	**curl and divergence** • 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	• Lectures • Problem Solving	**TB1:** Chapter 3: Matrices Chapter 6: Vector spaces
25.	**Vector spaces** • Subspace of a Vector Space and examples		
26.	**Linear 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		

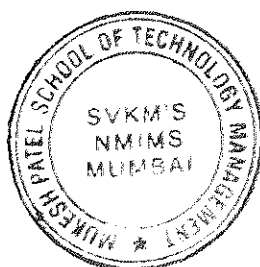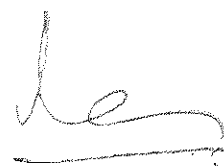|			
29.	**Matrix associated with a linear map** • Matrix associated with a linear map (continuation) • one-one correspondence between Linear Transformation and Matrices		
30.	**Range and Kernal of a linear map, rank, nullity** • Determining Range and Kernal of a Linear map • Determining rank and nullity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

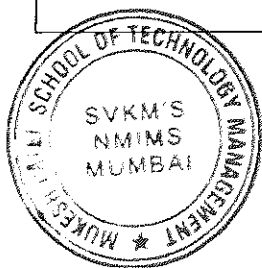|			
	• For symmetric matrices • For skew symmetric matrices	• Problem Solving • Discussion of real life examples	**TB3:** Chapter 2: Linear Algebra: Determinant, matrices
40.	**Eigenvalues and eigenvectors** • For orthogonal matrices		
41.	**Diagonalization of matrices** • Testing if a matrix is diagonalizable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

Signature
(Prepared by Concerned Faculty/HOD)

Signature
(Approved by Dean)

Program: MBA. Tech. (I.T., EXTC, Mechanical, Civil, Computer & Chemical)				Semester: I		
Course/Module: Programming for Problem Solving				Module Code: MBIT01002, MBET01002, MBME01002, MBCI01002, MBCO01002, MBCH01002		
Teaching Scheme					Evaluation Scheme	
Classroom Session	Lecture (Hours per week)	Tutorial (Hours per week)	Practical/ Group work (Hours per week)	Credit	Continuous Evaluation (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:

1. 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://cprogrammingcodes.blogspot.in/2011/09/algorithms-and-flowchart.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**	--	--
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.	**From algorithms to programs:** • 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 • Presentations • Quizzes	**TB1, TB2:** Chapter 3: Operators and expressions
5.	**Expressions**		
6.	**Decision making and Branching:** • If statements and if else statement		**TB1:** Chapter 5: Control Statements **TB2:** Chapter 5: Decision making and branching
7.	**Nesting of if else statements and Else if ladder**		
8.	**Switch statements**		
9.	**Continue statement Break statement**		
10.	**Looping – while**		**TB1:**
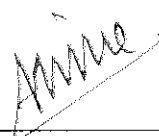
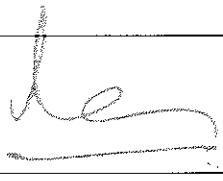|			
11.	do-while		Chapter 6: Control Statements
12.	For loops		**TB2:**
13.	For loops and Finding roots of equations		Chapter 6: Decision making and looping
14.	Nested loops		
Unit 3	**Arrays and Strings**	--	--
15.	• Concept, declaration, initialization • Accessing array elements of one-dimensional array	• Lectures • Problem Solving	**TB1:** Chapter 9: Arrays **TB2:**
16.	**One-dimensional array**	• Quizzes	Chapter 7: Arrays
17.	• Concept, declaration, initialization • Accessing array elements of two-dimensional array		
18.	**Two - dimensional array**		
19.	**Introduction to strings**		
Unit 4	**Functions**	--	--
20.	**Function** • Introduction and need of user defined functions	• Lectures • Problem Solving	**TB1:** Chapter 7: Functions **TB2:**
21.	• Defining a Function • Function calls and declaration	• Quizzes	Chapter 9: User defined 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 arrays and strings
27.	Passing strings to functions		
Unit 5	**Recursion**	--	--
28.	**Introduction to Recursion** • Recursion as a different way of solving problems adjoint method	• Lectures • Problem	**TB1:** Chapter 7: Functions

| 29.	**Recursion programs:** • Examples - Finding Factorial, Fibonacci series	Solving • Presentation	**TB2:** Chapter 9: User defined functions
30.	**Recursion programs:** • Examples GCD, Merge sort.		
Unit 6	**Structures**	--	--
31.	• Defining a Structure Declaring structure variables • Accessing structure members • Structure Initialization	• Lectures • Problem Solving • Quizzes • Presentation	**TB1:** Chapter 11: Structure and unions **TB2:** Chapter 10: Structure and unions
32.	Array of Structure		
33.	Structure within structure		
34.	Difference between Structure and Unions		
Unit 7	**Pointers**	--	--
35.	• Idea of pointers • Defining pointers	• Lectures • Problem Solving • Quizzes • Presentation	**TB1:** Chapter 10: Pointers **TB2:** Chapter 11: Pointers
36.	Call by value and call by reference		
37.	Use of Pointers in self-referential structures, Notion of linked list (no implementation)		**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	• Lectures • Problem Solving • Quizzes • Presentation	
39.	Searching: Sequential search		
40.	Basic Sorting Algorithms : Bubble sort		**RB2:** Chapter 9: Sorting and searching
41.	Insertion sort		
42.	Selection sort		
43, 44,45	Beyond classroom activities; including remedial lectures, guest lectures and other extension activities.		

Signature
(Prepared by Concerned Faculty/HOD)

Signature
(Approved by Dean)

Program: MBA. Tech. (I.T., EXTC, Mechanical, Civil, Computer & Chemical)	Semester: I
Course/Module : Chemistry	Module Code: MBIT01003, MBET01003, MBME01003, MBCI01003, MBCO01003, MBCH01003

Teaching Scheme					Evaluation Scheme	
Classroom Session	Lecture (Hours per week)	Tutorial (Hours per week)	Practical/ Group work (Hours per week)	Credit	Continuous Evaluation (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*, 4 e, 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*, 7 e, Douglas A. Skoog, James F. Holler & Stanley R. Crouch, Cengage Learning, 2017.

Reference Books:

RB1. *Advanced Inorganic Chemistry*, 6 e, Frank A. Cotton & Gefforey Wilkinson, Wiley Eastern Ltd., 2007.

RB2. *Organic Chemistry*, 5 e, Stanley H. Pine, Tata McGraw Hill, 2008.

RB3. *Organic Chemistry*, 10 e, Graham T. W. Solomons & Craig B. Fryhle, John Wiley, 2009.
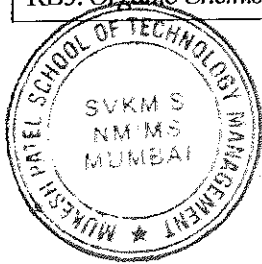
RB4. *Physical Chemistry*, 9e, Peter. W. Atkins, ELBS/Oxford, 2010.

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/
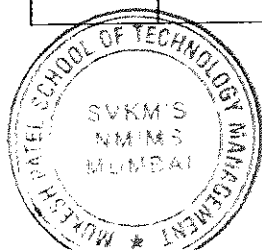- www.nptel.ac.in

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/qraDpWX_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_N^1 reaction, University of Surrey, 2011 (URL: https://youtu.be/JmcVgE2WKBE)
- S_N^2 reaction, University of Surrey, 2011 (URL: https://youtu.be/h5xvaP6bIZI)

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	**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

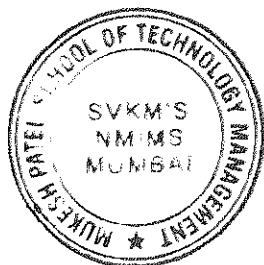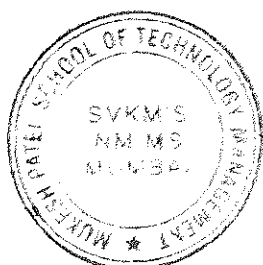|			
		Cotton & Gefforey Wilkinson, Wiley Eastern Ltd, 2007.	
5-6	Schrödinger's wave equation (no derivation). Atomic orbital, shapes of s, p, d, f orbitals.	**Article Discussion:** Lecture method and discussion Advanced Inorganic Chemistry, 6e, Frank A. Cotton & Gefforey Wilkinson, Wiley Eastern Ltd, 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**	--	--
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

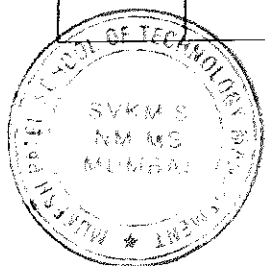|			
	Trends in physical properties: effective nuclear charge, atomic radii, ionization energy, electron affinity, electronegativity.	Advanced Inorganic Chemistry, 6e, Frank A. Cotton & Gefforey Wilkinson, Wiley Eastern Ltd, 2007.	
15-16	Metallic character, melting-boiling points (definitions for each 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**	--	--
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, 10th 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, 10th .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, 3rd 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, 3rd 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

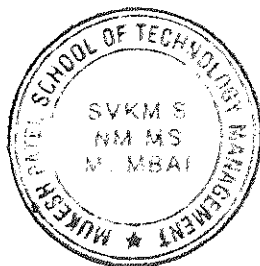| 30	Concepts of free energy (no derivations)	**Article Discussion:** Lecture method and discussion. Physical Chemistry, 9e, Peter. W. Atkins, ELBS/Oxford, 2010.	**TB1:** Chapter 7: Thermochemistry
31-32	EMF of Cell, Cell potential, Relation of free energy with EMF of cell	**Article Discussion:** Lecture 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, 44,45	Beyond classroom activities; including remedial lectures, guest lectures and other extension activities.		

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**Signature**
(Prepared by Concerned Faculty/HOD)

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(Approved by Dean)

Program: MBA. Tech. (I.T., EXTC, Mechanical, Civil, Computer & Chemical)	Semester: I
Course/Module: Workshop / Manufacturing Practices	Module Code: MBIT01004, MBET01004, MBME01004, MBCI01004, MBCO01004, MBCH01004

Teaching Scheme					Evaluation Scheme	
Classroom Session	Lecture (Hours per week)	Tutorial (Hours per week)	Practical/ Group work (Hours per week)	Credit	Continuous Evaluation (Marks-50)	Term End Examinations (TEE) (Marks - 100 in Question Paper)
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.
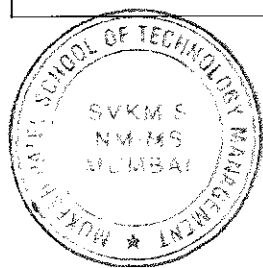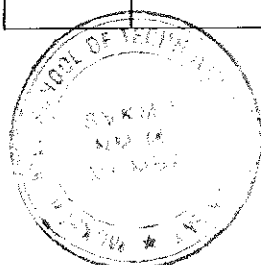
Links to websites:

- 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:**

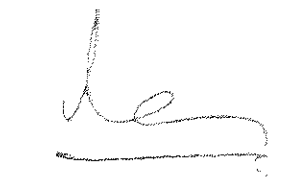|			Chapter 9: Welding process
			Chapter 10: Other fabrication process
Unit 3	**Machining Methods**	--	--
6.	Machining Operations	• Lectures • Application-based videos	**TB1:** Chapter 10: Turning
7.	CNC machining	• Lectures • Application-based videos	**RB1:** Chapter 28: Computer Numerical Control 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	• Lectures • Demonstration 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; including remedial lectures, guest lectures and other extension activities.		

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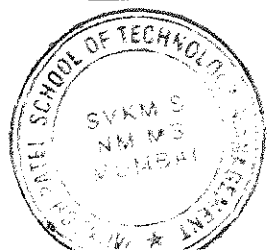**(Prepared by Concerned Faculty/HOD)**
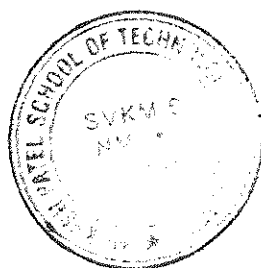
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SVKM's Narsee Monjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: MBA. Tech. (I.T., EXTC, Mechanical, Civil, Computer & Chemical)	Semester: I
Course/Module: English	Module Code: MBIT01005, MBET01005, MBME01005, MBCI01005, MBCO01005, MBCH01005

Teaching Scheme					Evaluation Scheme	
Classroom Session	Lecture (Hours per week)	Tutorial (Hours per week)	Practical/ Group work (Hours per week)	Credit	Continuous Evaluation (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
2. 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
4. 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.
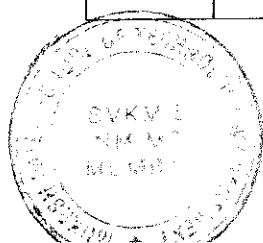
Links to websites:

* 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:**

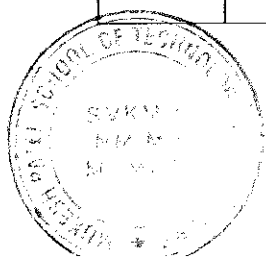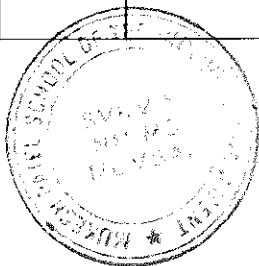|			
	sentences	• Classroom Exercises • Practice worksheets	Chapter:(appended) Handbook of Grammar Chapter:(appended) Mechanics and Usage **TB2:** Chapter 11: Elements of Effective Writing
5.	Importance of proper punctuation	• Classroom Teaching • Classroom Exercises • Practice worksheets	**TB1:** Chapter:(appended) Handbook of Grammar Chapter:(appended) Mechanics and Usage **TB2:** Chapter 11: Elements of Effective Writing
6.	Principles of effective writing (including techniques for writing precisely)	• Classroom Teaching • Classroom Exercises • Practice worksheets • Written Assignments	**TB2:** Chapter 11: Elements of Effective Writing **RB2:** Chapter 4: The Process of Writing
7.	Organizing principles of paragraphs in documents	• Classroom Teaching • Classroom Exercises • Practice worksheets • Written Assignments	**TB2:** Chapter 11: Elements of Effective Writing **RB2:** Chapter 4: The Process of Writing
Unit 3	**Identifying Common Errors in Writing**	--	--
8.	Subject-verb 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

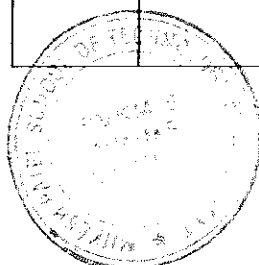|			TB3:
			Chapter: Part II-Topic 7
			Subject Verb Agreement
9.	Noun-pronoun agreement	• Classroom Teaching • Classroom Exercises • Practice worksheets	TB1: Chapter:(appended) Handbook of Grammar, Chapter:(appended) Mechanics and Usage TB2: Chapter 17: Grammar and Vocabulary Development
10.	Misplaced 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 Teaching • Classroom Exercises • Practice worksheets	TB2: Chapter 11: Elements of Effective Writing
Unit 4	**Nature and Style of Sensible Writing**	--	--
13.	Describing – technical description of objects,	• Classroom Teaching • Classroom Exercises	TB2: Chapter 11:

	processes and instruction writing	• Practice worksheets • Written Assignments	Elements of Effective Writing Chapter 16: Research Paper and Technical Descriptions
14.	technical description of processes and instruction writing	• Classroom Teaching • Classroom Exercises • Practice worksheets • Written Assignments	**TB2:** Chapter 11: Elements of Effective Writing Chapter 16: Research Paper and Technical Descriptions
15.	Defining and Classifying	• Classroom Teaching • Classroom Exercises • Practice worksheets • Written Assignments	**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:

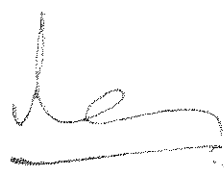|		• Classroom Exercises • Practice worksheets • Written Assignments	Reading Comprehension Chapter 11: Elements of Effective Writing
19.	Précis Writing	• Classroom Teaching • Classroom Exercises • Practice worksheets • Written Assignments	**TB2:** Chapter 12: The Art of Condensation
20.	Essay Writing	• 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 Teaching • Listening Exercises	**TB2:** Chapter 4: Active Listening
22.	Listening – barriers to listening, steps to improve listening skills and listening comprehension	• Classroom • Teaching • Listening 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:

			Basics of Technical Communication
26.	Organizational Barriers to Communication	• Classroom • Teaching • Classroom Discussion • Written 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; including remedial lectures, guest lectures and other extension activities.		

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