Semester First
MATHEMATICS – I (BMCI101)

SECTION-A

SET THEORY AND RELATIONS
Sets- Elements of a set, methods of describing a set, types of sets, Operations on sets-- union, intersection and difference of sets, Venn diagrams, statement problems, Associative Laws, Distributive laws, DeMorgan's laws, duality, partitioning of a set.
Relation -Basic definition of relation and types of relations, graphs of relations, properties of relations, (domain, range, inverse and composite relations), Matrix representation of a relation.

SECTION-B

ALGEBRA OF LOGIC, MATHEMATICAL INDUCTION
Propositions and Logic operations, truth tables, arguments and validity of arguments, propositions generated by a set, equivalence and implication laws of logic, mathematical system and propositions over a universe, Quantifiers, Principle of Mathematical Induction.

SECTION-C

GRAPH THEORY
Various types of graphs- Simple and multi graphs, directed and undirected graphs, Eulerian and Hamiltonian graphs, Graph connectivity, graph traversals, graph optimizations, graph coloring, Trees, spanning trees.

SECTION-D

RECURSION AND RECURRENCE RELATIONS
Recursion, many faces of recursion, recurrence relations, some common recurrence relations, Matrix Operations: Addition, Subtraction, Multiplication and Inverse
SECTION-A
English Language: Sentence, Parts of speech, Tenses, Active passive voice, Direct Indirect speech, Creative writing& vocabulary, Comprehension passage, Reading of biographies of at least 10 IT business personalities (can be a home assignment or classroom reading).

SECTION-B
Business communication-Types, Medias, Objectives, Modals, Process, Importance Understanding Barriers to communication & ways to handle and improve barriers.

SECTION-C
Presentation skills-Its Purpose in business world, How to find material for presentation, How to sequence the speech with proper introduction and conclusion, How to Prepare PPT& Complete set of required body language while delivering presentation.
Reading & writing skills- Importance of reading and writing, improving writing skills through understanding and practicing Notice, E-mail, Tenders, Advertisement, formal letter.

SECTION-D
Listening skills-Its importance as individual and as a leader or as a worker, Its types, barriers to listening & remedies to improve listening barriers.
Non verbal Communication- understanding what is called non verbal communication, its importance as an individual, as a student, as a worker and as a leader, its types.
SECTION- A
Course Introduction – Need, Basic Guidelines, Content and Process for Value Education
• Understanding the need, basic guidelines, content and process for Value Education.
• Self Exploration– what is it? - its content and process; „Natural Acceptance” and Experiential Validation- as the mechanism for self exploration.
• Continuous Happiness and Prosperity- A look at basic Human Aspirations
• Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
• Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
• Method to fulfill the above human aspirations: understanding and living in harmony at various levels

Understanding Harmony in the Human Being – Harmony in Myself!
• Understanding human being as a co-existence of the sentient „I” and the material „Body”
• Understanding the needs of Self („I”) and „Body” – Sukh and Suvidha
• Understanding the Body as an instrument of „I” (I being the doer, seer and enjoyer)
• Understanding the characteristics and activities of „I” and harmony in „I”
• Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail
• Programs to ensure Sanyam and Swasthya (7)

Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship
• Understanding harmony in the Family- the basic unit of human interaction
• Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Udbhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship
• Understanding the meaning of Vishwas; Difference between intention and competence
• Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship
• Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive Human Goals
• Visualizing a universal harmonious order in society- Undivided Society (Akhand Samaj), Universal Order (Sarvabhaum Vyawastha)- from family to world family!
PART B
Understanding Harmony in the Nature and Existence – Whole existence as Co-existence

- Understanding the harmony in the Nature
- Interconnectedness and mutual fulfillment among the four orders of naturerecyclability and self-regulation in nature
- Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space
- Holistic perception of harmony at all levels of existence

Implications of the above Holistic Understanding of Harmony on Professional Ethics

- Natural acceptance of human values
- Definitiveness of Ethical Human Conduct
- Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
- Competence in professional ethics:
  - Ability to utilize the professional competence for augmenting universal human order
  - Ability to identify the scope and characteristics of people-friendly and ecofriendly production systems
  - Ability to identify and develop appropriate technologies and management patterns for above production systems.
- Case studies of typical holistic technologies, management models and production systems
- Strategy for transition from the present state to Universal Human Order:
  - At the level of individual: as socially and ecologically responsible engineers, technologists and managers
  - At the level of society: as mutually enriching institutions and organizations
SECTION- A

**Computer Fundamentals:** Block structure of a computer, characteristics of computers, problem solving with computers, generations of computers, and classification of computers on the basis of capacity, purpose, and generation.

**Number System:** Bit, byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, representation of characters, integers and fractions.

**Binary Arithmetic:** Addition, subtraction and multiplication.

SECTION-B

**Memory Types:** Magnetic core, RAM, ROM, Secondary, Cache, Bubble Memory.

**Input and Output Units:** Keyboard, Mouse, Monitor (CRT and LCD): Light pen, joystick, Mouse, Touch screen; OCR, OMR, MICR

**Overview of storage devices:** Floppy disk, hard disk, compact disk, tape.

**Printers:** Impact, non-impact, working mechanism of Drum printer, Dot Matrix printer, Inkjet printer and Laser printer.

**Computer languages:** Machine language, assembly language, higher level language, 4GL. Introduction to Compiler, Interpreter, Assembler, Assembling, System Software, Application Software.

SECTION-C

**Operating system:** Batch, multi-programming, time sharing, network operating system, on-line and real time operating system, Distributed operating system, multi-processor, Multi-tasking.

**Graphical OS:** Fundamentals of windows, types of windows, anatomy of windows, windows explorer, customizing windows, control panel, taskbar setting, Network Neighborhood.

**Personal Productivity Software:**

**Word processing:** Editing features, formatting features, saving, printing, table handling, page settings, spell-checking, macros, mail-merge, equation editors.

**Spreadsheet:** Workbook, worksheets, data types, operators, cell formats, freeze panes, editing features, formatting features, creating formulas, using formulas, cell references, replication, sorting, filtering, functions, Charts & Graphs.

**Presentation Graphics Software:** Templates, views, formatting slide, slides with graphs, animation, using special features, presenting slide shows.

SECTION -D

**Computer Network and Communication:** Network types, network topologies, network communication devices, physical communication media.

**Internet and its Applications:** E-mail, TELNET, FTP, World Wide Web, Internet chatting; Intranet, Extranet, Gopher, Mosaic, WAIS.

**Security management tools:** PC tools, Norton Utilities, Virus, worms, threats, virus detection, prevention and cure utilities, Firewalls, Proxy servers.
SECTION-A

Fundamentals of „C“: I/O statements, Assignment Statements, Constants, Variables, Operators and Expressions, Standards and Formatted statements, Keywords, Data Types and Identifiers.

SECTION-B

Control Structures: Introduction, Decision making with if – statement, if-else and Nested if, while and do-while, for loop. Jump statements: break, continue, goto, switch Statement

SECTION-C

Arrays: Introduction to Arrays, Array Declaration, Single and Multidimensional Array, Memory Representation, Matrices, Strings, String handling functions.
Structure and Union: Declaration of structure, Accessing structure members, Structure Initialization, Arrays of structure, nested structures, Unions

SECTION-D

Pointers: Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointers and Arrays
Files: Introduction, Creating a data file, opening and closing a data file, processing a data file.
Preprocessor Directives: Introduction and Use, Macros, Conditional Preprocessors, Header Files
SOFTWARE LAB-I (Information Technology)
(BMCI105)

This laboratory course will mainly comprise of exercise on what is learnt under the paper: (BMCI104)

1. Familiarizing with PC and WINDOWS commands,
2. File creation,
3. Editing
5. Mastery of DOS internal & external commands.
6. Learning to use MS Office: MS WORD, MS EXCEL & MS PowerPoint.
This laboratory course will mainly comprise of exercise on what is learnt under the paper: (BMCI105)

1. **Keywords and Identifiers**: introduction, purpose
2. **Variables and constants**: data types, Initialization, declaration, scope, memory limits
3. **Input-output statements**: formatted and non-formatted statements
4. **Operators**: Arithmetic, logical, conditional, assignment, bitwise, increment/decrement operators
5. **Decision Making**: switch, if-else, nested if, else-if ladder, break, continue, goto
6. **Loops**: while, do-while, for
7. **Functions**: definition, declaration, variable scope, parameterized functions, return statement, call by value, call by reference, recursive functions
8. **Pre-processor Directives**: Pre-processor directives like INCLUDE, IFDEF, DEFINE, etc
9. **Header Files**: STDIO.H, MATH.H, STRING.H, PROCESS.H etc
10. **Arrays**: Array declarations, Single and multi-dimensional, memory limits, strings and string functions
11. **Pointers**: Pointer declarations, pointer to function, pointer to array/string,
12. **Files**: Creation and editing of various types of files, closing a file( using functions and without functions)