Name of Institute: Indus Institute of Management Studies (IIMS)

Name of Faculty: Dr. Neerav Verma

Course Code: BC0105

Course Name: Business Mathematics

Pre-requisites: H.S.C

Credit Points: 6 Credits

Offered Semester: I

Course Lecturer (Weeks 01 – 15)

Full name: Dr. Neerav Verma

Department with Siting location: Management

Telephone: 9818351870

Email: neeravverma.iims@indusuni.ac.in

Consultation times: 4:00 PM to 5:00 PM

Students will be contacted throughout the Session via Mail with important information relating to this Course.

Course Objectives

- To create a better understanding of Mathematical concepts in solving business related problems.
- To have a proper understanding of mathematical applications in Economics, Finance, Commerce and Management

Course Outcomes (CO)

On successful completion of this course students will be able to:

CO1: Explain the concepts and use equations, formulae, and mathematical expressions and relationships in a variety of contexts.
CO2: Apply mathematical concepts and principles to perform computations.
CO3: Apply the knowledge of mathematics in solving business problems.
CO4: Create, use and analyze graphical representations of mathematical relationships.
CO5: Analyse and demonstrate mathematical skills required in mathematically intensive areas in Economics, Finance and business.

CO6: To develop the ability to interpret the numerical information that forms the basis of decision-making in business.

Course Outline

Unit I
Set Theory

Basic Concept of Set, Types of sets, Basic Set Operations (Union, Intersection, Complement), De Morgan's Law, Laws of set Algebra, Venn Diagram, Cardinal of a set, Concepts of ordered pairs, Cartesian Product of two sets, Application of Set Theory

Permutations & Combinations
Introduction to Permutations & Combinations, Important Notations - Their Meaning & Properties, Different cases of permutation such as word formation, Permutation when things are repeated, Restricted Combination, Applications

Unit-II
Function & Limit

Meaning and Definition of Function, Different types of functions, Construction of Functions; Linear & Quadratic Functions; Some Special Functions – Log Function; Exponential Function; Modulus Function, Graphical Presentation of Functions, Functions used in Economics (Demand, Supply, Revenue, Cost, Profit, Production, Average Cost & Average Revenue), Application of Function to Business - Break-even Analysis Functions, Limits of a Function; Continuous Functions, Limits of a Sequence, Rules of Limit, Standard Results of Limits

Unit-III
Co-ordinate Geometry

Cartesian Co-ordinate System, General Equation of Straight Line, Standard Equation of Straight Line, Distance Formula, Intercept & Slope of a Line, Different Forms of Equations of a straight Line, Concept and properties of Perpendicular and Parallel Lines

Progressions

Meaning of Sequence & Series; General Terms of Sequence; Sum of Series Arithmetic Progression; Sum of a series, Arithmetic Mean, Geometric Progression; Sum of a series, Geometric Mean, Sum of the Finite & Infinite Progression & Applications.

Unit-IV

Mathematics of Finance: Introduction, Simple interest, Compound interest, Interest Compound Continuously, Nominal and Effective Rate of Interest, Depreciation, Present value, Annuity, Types of Annuities, Simple applications

Method of delivery

Lectures, PPT, Quantitative Case Studies/ Numerical, Experiential Exercises, Active Learning Techniques.

Study time

Six hours per week

CO-PO Mapping (PO: Program Outcomes)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	1			1		
CO 2	1			1		
CO 3	1			1		
CO 4	1			1		
CO 5	1			1		
CO 6	1			1		

Blooms Taxonomy and Knowledge Retention (For reference)

(Blooms taxonomy has been given for reference)

Figure 1: Blooms Taxonomy

average student retention rates

- 10% — Lecturing
- Reading
- 20% — Audiovisual
- 30% — Demonstration
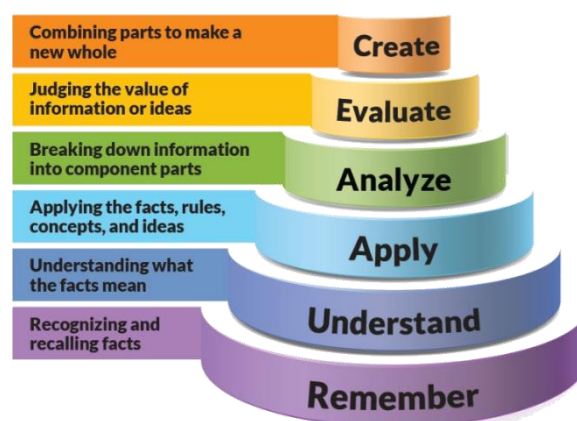- 50% — Discussion
- 75% — Practical doing
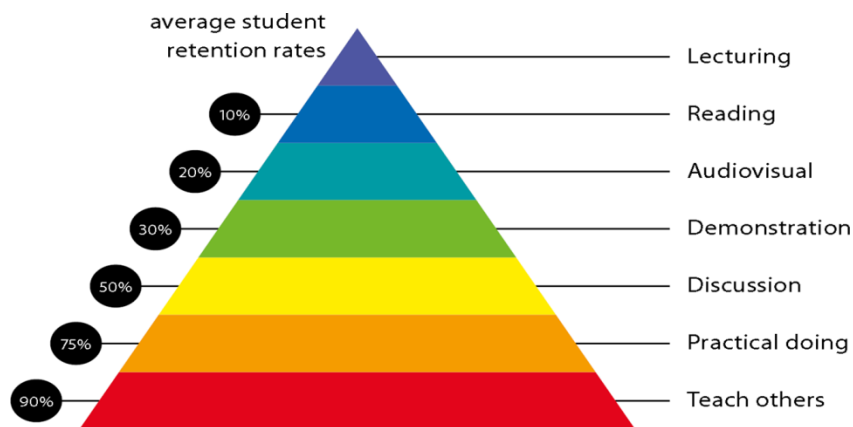- 90% — Teach others

Figure 2: Knowledge retention

Graduate Qualities and Capabilities covered

(Qualities graduates harness crediting this Course)

General Graduate Qualities	Specific Department of _____Graduate Capabilities
Informed Have a sound knowledge of an area of study or profession and understand its current issues, locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas.	**1 Professional knowledge, grounding & awareness**
Independent learners Engage with new ideas and ways of thinking and critically analyze issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.	**2 Information literacy, gathering & processing**
Problem solvers Take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible,	**3 Problem solving skills**

thorough, innovative and aim for high standards.	
Effective communicators Articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognize how culture can shape communication.	**4 Written communications**
	5 Oral communication
	6 Teamwork
Responsible Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.	**7 Sustainability, societal & environmental impact**

Practical work:

1. ASSIGNMENT -1: Unit 1 & 2

2. ASSIGNMENT -2: Unit 3 & 4

3. Presentation (Solve Numerical)

Lecture/ Tutorial Times:

1hr / lecture or tutorial

Attendance Requirements:

The University norms states that it is the responsibility of students to attend all lectures, tutorials, seminars and practical work as stipulated in the Course outline. Minimum attendance requirement as per university norms is compulsory for being eligible for mid and end semester examinations.

Details of referencing system to be used in written work

Text Books:

1. Business Mathematics: Padmalochan Hazarika, Publishers: S. Chand (latest edition)
2. Business Mathematics: Kashyap Trivedi and Chirag Trivedi, Publishers: Pearson (latest edition)

Reference Books:

1. Business Mathematics: D.C. Sancheti and V.K. Kapoor, Publishers: Sultan Chand
2. Business Mathematics: Theory and Application: J.K. Sharma, Publishers: Ane Books
3. Business Mathematics: J.K. Singh, Himalaya Publishing House
4. Mathematics for Management: M. Raghavachari, Tata Mc GrawHill
5. Business Mathematics: Kashyap Trivedi and Chirag Trivedi

ASSESSMENT GUIDELINES

Final course mark will be calculated from the following:

Assignment 1 & 2	**(5 + 5) Marks**
Presentation	**5 Marks**
Attendance	**5 Marks**
Mid Semester Exam	**40 Marks**
Final Exam	**40 Marks**

SUPPLEMENTARY ASSESSMENT

Students who receive an overall mark less than 40% in mid semester or end semester will be considered for supplementary assessment in the respective components (i.e. mid semester or end semester) of semester concerned. Students must make themselves available during the supplementary examination period to take up the respective components (mid semester or end semester) and need to obtain the required minimum 40% marks to clear the concerned components.

Practical Work Report/Laboratory Report:

---NA----

Late Work

Late assignments will not be accepted without specific reasons and supporting documents.

Format

All assignments must be presented in a neat, legible format with all information sources correctly referenced. **Assignment material handed in throughout the session that is not neat and legible will not be marked and will be returned to the student.**

Retention of Written Work

Written assessment work will be retained by the Course coordinator/lecturer for two weeks after marking to be collected by the students.

University and Faculty Policies

Students should make themselves aware of the University and/or Faculty Policies regarding plagiarism, special consideration, supplementary examinations and other educational issues and student matters.

Plagiarism - Plagiarism is not acceptable and may result in the imposition of severe penalties.   Plagiarism is the use of another person's work, or idea, as if it is his or her own - if you have any doubts at all on what constitutes plagiarism, please consult your Course coordinator or lecturer. Plagiarism will be penalized severely.

Do not copy the work of other students.

Do not share your work with other students (except where required for a group activity or assessment)

Course Schedule (subject to change)

(Mention quiz, assignment submission, breaks etc as well in the table under the Teaching Learning Activity Column)

Week #	Topic & contents	CO Addressed	Teaching Learning Activity (TLA)
Weeks 1	Basic Concept of Set, Types of sets, Basic Set Operations (Union, Intersection, Complement), De Morgan's Law, Laws of set Algebra	CO1, CO2 & CO3	Lecture
Weeks 2	Venn Diagram, Cardinal of a set, Concepts of ordered pairs, Cartesian Product of two sets, Application of Set Theory	CO1, CO2, CO3 & CO4	Lecture
Week 3	Introduction to Permutations & Combinations, Important Notations - Their Meaning & Properties, Different cases of permutation such as word formation	CO1, CO2 & CO3, CO6	Lecture

Week 4	Permutation when things are repeated, Restricted Combination, Applications	CO2, CO5 & CO6	Lecture
Week 5	Meaning and Definition of Function, Different types of functions, Construction of Functions; Linear & Quadratic Functions	CO1, CO3 & CO4	Lecture
Week 6	Some Special Functions – Log Function; Exponential Function; Modulus Function, Graphical Presentation of Functions	CO2, CO3 & C04	Lecture
Week 7	Functions used in Economics (Demand, Supply, Revenue, Cost, Profit, Production, Average Cost & Average Revenue)	CO2, CO4 & CO5	Lecture
Week 8	Application of Function to Business - Break-even Analysis Functions, Limits of a Function; Continuous Functions, Limits of a Sequence, Rules of Limit, Standard Results of Limits	CO2, CO3 & CO6	Lecture
Week 9	Cartesian Co-ordinate System, General Equation of Straight Line	CO1, CO2 & CO4	Lecture
Week 10	Standard Equation of Straight Line, Distance Formula, Intercept & Slope of a Line	CO2 & CO4	Lecture
Week 11	Mid Term	N.A	N.A
Week 12	Different Forms of Equations of a straight Line, Concept and properties of Perpendicular and Parallel Lines	CO4 & CO5	Lecture
Week 13	Meaning of Sequence & Series; General Terms of Sequence; Sum of Series Arithmetic Progression; Sum of a series, Arithmetic Mean	CO2, CO3, CO5 & CO6	Lecture
Week 14	Geometric Progression; Sum of a series, Geometric Mean Introduction of Simple & Compound interest, Interest Compound Continuously	CO2, CO3, CO5 & CO6	Lecture
Week 15	Nominal and Effective Rate of Interest, Depreciation, Present value, Annuity & its' types, Simple applications	CO2, CO3, CO5 & CO6	Lecture