Useful links:

1. https://open.umn.edu/opentextbooks/textbooks?term=sustainable+development&commit=Go
2. http://www.sacep.org/pdf/Reports-Technical/2002-UNEP-SACEP-Law-Handbook-India.pdf
3. https://moef.gov.in/wp-content/uploads/wssd/doc2/ch2.html
4. https://www.oecd.org/env/outreach/37838061.pdf

Note: Suggested readings will be updated by the Department of Commerce and uploaded on the Department's website.

Discipline Specific Elective Course- 5.4 (DSE-5.4): Business Mathematics

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Business Mathematics DSE-5.4	4	3	0	1	Pass in Class XII	NIL

Learning Objectives

The course aims to familiarize students with the applications of Mathematics and Statistical techniques in business decision making.

Learning Outcomes

After completion of the course, learners will be able to:

1. Identify proficiency in using different mathematical tools in solving real life business and economic problems.
2. Analyse how matrices are used as mathematical tool in representing a system of equations.
3. Apply differential calculus to solve simple business problems.
4. Discuss mathematical formulation and solution of problems related to finance including different methods of interest calculation, future and present value of money.
5. Identify business problems involving linear relationships between decision variables and their determining factors.

SYLLABUS OF DSE-5.4

Unit 1: Matrices (9 hours)

Definition and types; Algebra of matrices; Applications of matrix operations to simple business and economic problems; Calculation of values of determinants up to third order; Finding the solution of system of linear equations up to three variables by Matrix Inversion and Cramer's Rule.

Unit 2: Differentiation (9 hours)

Concept and rules of differentiation; applications of differentiation - elasticity of demand and supply, Cost, Revenue, Profit and Break Even Point, Maxima and Minima of functions relating to cost, revenue and profit.

Unit 3: Integration (9 hours)

Standard forms of Integration Definite integration. Application of Integration to marginal analysis; Marginal Cost to Cost function, Marginal Revenue to Revenue function, Elasticity of Demand to Demand function.

Unit 4: Basic Mathematics of Finance (9 hours)

Simple and Compound interest (including continuous compounding); Rates of interest - nominal and effective and their inter-relationships; Compounding of a sum using different types of rates.

Unit 5: Linear Programming (9 hours)

Formulation of Linear programming problems (LPPs), Graphical solutions of LPPs. Cases of unique solutions, multiple optional solutions, unbounded solutions, infeasibility, and redundant constraints.

Practical Exercises:

The learners are required to:

1. Identify the decision-making variables and assess their functional relationship with other variables affecting the decision in a hypothetical business situation.
2. Take the business case and assess how the use of matrices helps in deciding about competing alternatives
3. Identify and formulate business problems as an application of calculus
4. Identify and solve business problems of any company of your choice as an application of linear programming
5. Gather information about various deposit and loan schemes of banks to find out interest rate differential, and compounded value.

Note: Use of a simple calculator is allowed. Proofs of theorems/ formulae are not required.

Suggested Readings:

- Aggarwal, B. M. (2018). *Business Mathematics.* Delhi, India: Kitab Mahal.
- Anthony, M., & Biggs, N. (1996). *Mathematics for Economics and Finance.* Cambridge, United Kingdom: Cambridge University Press.
- Ayres, F. J. (1963). *Theory and Problems of Mathematics of Finance.* New York,

United States: McGraw Hill Publishing.

- Budnick, P. (1986). *Applied Mathematics for Business, Economics, & Social Sciences.* New York, United States of America : McGraw Hill Publishing.
- Dowling, E. (2011). *Introduction to Mathematical Economics.* New York, United States: McGraw Hill Publishing Kapoor.
- Ghosh, S., & Sinha, S. (2018). *Business Mathematics and Statistics.* Delhi, India: Oxford University Press.
- Sharma, S. K., & Kaur, G. (2019). *Business Mathematics.* Delhi, India: Sultan Chand & Sons (P) Ltd.
- Thukral, J. K. (2020). *Mathematics for Business Studies.* Delhi, India: Mayur Paperbacks.
- Singh, J. K. (2017). *Business Mathematics.* Delhi, India: Himalaya Publishing House.
- V. K., & Sancheti, D. C. (2014). B*usiness Mathematics, Theory & Applications.* Delhi, India: S. Chand Publishing.

Note: Suggested readings will be updated by the Department of Commerce and uploaded on the Department's website.

Discipline Specific Elective Course- 5.5 (DSE-5.5): Accounting for Mergers & Acquisitions and Valuation

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Accounting for Mergers & Acquisitions and Valuation DSE-5.5	4	3	1	0	Pass in Class XII	NIL

Learning Objectives: The course aims to help learners to conceptualise the knowledge of value creation through Mergers and Acquisitions and acquire skills for accounting for Mergers and Acquisitions both from the perspective of India and Internationally.

Learning Outcomes: After completion of the course, learners will be able to understand:

1. Define value creation through Mergers and Acquisitions.
2. Describe valuation tools used during Mergers and Acquisitions.
3. Demonstrate accounting for Mergers and Acquisitions from Indian Perspective.
4. Demonstrate the accounting for Mergers and Acquisitions from International Perspective.

5. Analyse the different types of Synergic effects and the concept of Demerger along with Reverse Merger.

SYLLABUS OF DSE-5.5

Unit 1: Introduction to Mergers and Acquisitions (9 hours)
Introduction to mergers and acquisitions (M&A), Types of Mergers, Participants in Merger and Acquisition, Understanding financial statements and key valuation concepts, Leveraging M&A for value creation, M&A- Cure for Corporate Turbulence, Fast Track Mergers, Significance of Intellectual Property Rights in M&A, Cross Border Mergers.

Unit 2: Modelling and Valuation (9 hours)
Income Approach (Capitalization Method and Discounted Cash Flow Method); Market Approach (Comparable Company Method); Assets Approach (Book Value Method and Liquidation Method); Modelling for Internal Rate of Return calculations; Discounted cash flow valuation; Due Diligence in M&A, Negotiation; Synergistic benefits and distribution of Synergy gains.

Unit 3: Accounting for Mergers and Acquisitions (Indian Perspective) (9 hours)
Looking at the dynamics of an actual transaction, Examining the effects of the transaction, Accounting for Amalgamation in the nature of Purchase, Accounting for Amalgamation in the nature of Merger, Treatment of Reserve on Amalgamation, Amalgamation after balance sheet date, Acquisition under Business Transfer Agreement (BTA), Accounting for Business Combination as per Ind AS 103, Identifying a business combination, Acquisition Method, Acquisition Date, Applications of Acquisition methods, Common Control Accounting as per Ind AS 103, Accounting for Acquisition-related Transaction Costs, Acquisition of control through the acquisition of Equity Shares, Acquisition of Group of Assets.

Unit 4: Accounting for Mergers and Acquisitions (International Perspective) (9 hours)
Identification of the Acquirer, Determining the Acquisition Date, Recognising and Measuring Identifiable Assets Acquired & Liabilities, Conditions for Recognition (IFRS 3 Paras 10-14), Measurement Principle- Fair Values (IFRS 3 Para 18) subject to Exceptions (IFRS 3 Paras 22-31A), Recognising and Measuring any Non-Controlling Interest (NCI), Identifying and Measuring Consideration (IFRS 3 Para 37), Recognising and Measuring Goodwill or Gain from a Bargain Purchase transaction, Controversies and Dilemma in Accounting for M&A, Accounting for M&A, Features of Pooling Accounting, Criteria for Pooling of Interests, Incentives to choose Pooling Over Purchase, Accounting for Valuation of Goodwill, IFRS-3 on International Accounting Standards for M&A, Comparison between Indian GAAP and IFRS-3.

Unit 5: Laws and Regulations affecting M&A, Demerger and Reverse Merger (9 hours)
Tax Laws, The Companies Act, 2013, The Competition Act, 2002, SEBI Regulations and any other laws and regulations affecting M&A, Substantial Acquisitions and Buyouts in listed and unlisted space, Ethical Considerations in M&A; Conceptualization of Demerger; Tax Laws, The Companies Act, 2013, SEBI Regulations and any other laws and regulations affecting Demerger; Accounting Aspects of Demerger, Demerger *vs.* Reconstruction; Reverse Merger.