



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Commerce

Choice Based Credit System (CBCS) in Light of NEP-2020

B.Com. - IV SEMESTER (2024-2027)

BCOM401 - COST ACCOUNTING

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BCOM401	MAJ/MIN	Cost Accounting	60	20	20	-	-	3	-	-	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; **MAJ/MIN-** Major/Minor Course

***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective

1. Understand the concepts of cost. Classify cost concepts.
2. Familiarity with concepts, and processes used to determine product cost.

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of five questions. Each question will carry 12 Marks and consist of four questions, out of which student will be required to attempt either question number (a) and (b) or question number (c) and (d).

Each question i.e. (a), (b), (c) and (d) will be of 6 marks.

Course Outcomes

- CO1** Know the significance of cost accounting.
- CO2** Know the meaning of inventory control and apply the techniques of inventory control.
- CO3** Understand the meaning of direct labour and indirect
- CO4** Apply different methods for dealing with under- and over-absorption overheads
- CO5** Identify the cost data with respect to operating costing

COURSECONTENT

Unit I: Introduction to Cost Accounting– Meaning and Definition of Cost, Costing and Cost Accounting – Objectives of Costing – Comparison between Financial Accounting and Cost Accounting – Designing and Installing a Cost Accounting System – Cost Concepts, Classification of Costs, Cost Unit, Cost Center, Elements of Cost, Preparation of Cost Sheet Tenders and Quotations.

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B.Com. - IV SEMESTER (2024-2027)

BCOM401 - COST ACCOUNTING

UNIT II: Material Cost Control – Meaning – Types: Direct Material, Indirect Material. Material Control – Purchasing Procedure– Store Keeping – Techniques of Inventory Control – Levels settings – EOQ – ABC Analysis– VED Analysis – Just In-Time – Perpetual Inventory System – Documents used in Material Accounting – Methods of Pricing Material Issues: FIFO, LIFO, Weighted Average Price Method, and Simple Average Price Method.

Unit III: Labour Cost Control–Meaning – Types: Direct Labour, Indirect Labour, Timekeeping, Time booking, Idle Time, Overtime, Labour Turn Over. Methods of Labour Remuneration: Time Rate System, Piece Rate System, Incentive Systems (Halsey plan, Rowan Plan, and Taylor's differential Piece Rate System).

Unit IV: Overhead Cost Control–Meaning and Definition, Classification of Overheads, Procedure for Accounting and Control of Overheads, Allocation of Overheads, Apportionment of Overheads, Primary Overhead Distribution Summary, Secondary Overhead Distribution Summary, Repeated Distribution Method and Simultaneous Equations Method, Absorption of Factory Overheads, Methods of Absorption (Theory Only) Machine Hour Rate, Problems on Machine Hour Rate.

Unit V: Operating Costing/Service Costing–Introduction Objectives Features Transport Costing, Boiler House Costing, Canteen House Costing, Hospital Costing Worked-out Problems. cost control and cost reduction–Meaning of cost control and cost reduction, areas covered by cost control and cost reduction.

Suggested Readings

1. Lal J., (2009). *Cost Accounting*. Tata McGraw- Hill Education, India.
2. Maheshwari, S.N. (2013). *Cost and Management Accounting*. Sultan Chand and Sons. Latest Edition
3. Arora M.N. (2016) *Cost and Management Accounting*. Himalaya Publishing House; Third Edition
4. Horngren, Foster and Dater, (2008). *Cost Accounting, a Managerial Emphasis*. Prentice Hall. Latest Edition.
5. Mohd, A. (2008).*Cost Accounting*. VrindaPublication. Latest Edition.
6. Kupappally, J. (2010).*Accounting for Managers*. PHI Learnings. Latest Edition.
7. Maheshwari, S.N.(2013).*Cost and management Accounting*. Sultan Chand and Sons. Latest Edition.

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Choice Based Credit System (CBCS) in Light of NEP-2020
B.Com. - IV SEMESTER (2024-2027)

BCOMTA401 ADVANCED CONCEPTS IN GST

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BCOMTA 401	MAJ/MIN	Advanced Concepts in GST	60	20	20	-	-	3	-	-	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; **MAJ/MIN-** Major/Minor Course

***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective

1. To acquaint the students with theoretical and practical knowledge of GST.
2. To familiarize the students with major and latest provisions of GST and integrated GST.

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of five questions. Each question will carry 12 Marks and consist of four questions, out of which student will be required to attempt either question number (a) and (b) or question number (c) and (d).

Each question i.e. (a), (b), (c) and (d) will be of 6 marks.

Course Outcomes

CO1 Familiarize and understand the concept of direct and indirect taxes, Goods and Service Tax, goods, services, suppliers, business, manufacturer, casual trader, aggregate turnover, input and output tax, tax credits, integrated tax, intermediary and output tax.

CO2 Analyze the difference between direct and indirect taxation, advantages of GST, procedure for registration under GST.

CO3 Evaluate the taxation structure before and after implementation of GST, types of tax rates under GST, eligibility and conditions for taking input credit.

CO4 Evaluate the taxes subsumed under CGST and SGST, eligibility and conditions for taking input credit, place of supply of Goods or services.

CO5 To make them to be a tax consultant in preparing the tax planning, tax management. Payment of tax and filing of tax returns.

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B.Com. - IV SEMESTER (2024-2027)

BCOMTA401 ADVANCED CONCEPTS IN GST

COURSE CONTENT

Unit I: Introduction to Provisions relating to GST – Review of various provisions regarding Goods and Service Tax (GST). Provisions relating to Tax invoice proforma and Procedure for preparing it (Practical Problems), Provisions regarding Debit and Credit Notes.

Unit II: Accounts and Payment - Accounts and Records in GST, Payment of Tax, Provisions relating to Interest and Refund.

Unit III: Returns - Furnishing details of outward supplies and Inward supplies, Furnishing of Returns, Types of various returns and relating Forms — Monthly Return, Quarterly Return (Composition), Annual Return.

Unit IV: Integrated GST and Reverses Charge - General study of Integrated Goods and Service Tax Act, (IGST) Special provisions relating to Job Work, Process for Reverse Charge mechanism.

Unit V: Administration of GST - Procedure and types of Assessment, GST Administration - appointment and powers of officers, Provisions of Inspection, Search, Seizure and arrests, Offences and penalties Appeals and Revision.

Suggested Readings

1. Subramanian, P.L. (2017). **Guide to GST**, Snow white Publications, India, Latest Edition.
2. Datey, V.S. (2019). **GST Ready Reckoner**, Taxmann Publications, New Delhi, India, Latest Edition.
3. Garg & Keshav, R (2021). **GST Ready Reckoner**, Bharat Publisher, New Delhi, India, Latest Edition.
4. Gupta, S.S. (2017). **GST Law & Practice**, Taxmann Publications, New Delhi, India, Latest Edition.

Website Visit

1. <https://services.gst.gov.in/>
2. <http://www.gstcouncil.gov.in/>

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Choice Based Credit System (CBCS) in Light of NEP-2020
B.Com. - IV SEMESTER (2024-2027)

BCOMBF401 INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME						CREDITS		
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	L	T	P	
BCOMBF401	MAJ/MIN	Investment Analysis and Portfolio Management	60	20	20	-	-	3	-	-	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; **MAJ/MIN-** Major/Minor Course

***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective

This course is designed to teach the fundamentals of investments along with the analysis and strategies to become a successful investor. It will start from the investment introduction to the performance Evaluation of securities and portfolios. It discusses the risk-return tradeoff of an individual investor, and it also persists on how investment in the securities market is evaluated based on Fundamental and Technical analysis.

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of five questions. Each question will carry 12 Marks and consist of four questions, out of which student will be required to attempt either question number (a) and (b) or question number (c) and (d).

Each question i.e. (a), (b), (c) and (d) will be of 6 marks.

Course Outcomes

- CO1** Understand the various alternatives available for investment.
- CO2** Understand the various types of security analysis which will help the students in Investment decision making.
- CO3** Understand various theories of portfolio management.
- CO4** Evaluate the relationship between risk and return.
- CO5** Gain knowledge of the various strategies and models followed by investment practitioners.

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Choice Based Credit System (CBCS) in Light of NEP-2020

B.Com. - IV SEMESTER (2024-2027)

BCOMBF401 INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT

COURSE CONTENT

Unit I: Introduction: Basics of Investment -Economic vs. Financial Investment, Investment vs. Speculation, Investment vs. Gambling, Investment Objectives, Investment Attributes, Features of a good investment, Investment Process.

Unit II: Analysis for Investment: Economy and Industry Analysis, Company Level Analysis, Fundamentals, and Technical Analysis. Approaches to Investment Decision Making, Emerging trends of Security Analysis in the global market.

Unit III: Portfolio Theory: Dow Theory, Elliot Wave Theory, Efficient market theory, Markowitz portfolio theory, Random-Walk Theory. Diversified and concentrated Portfolio.

Unit IV: Portfolio Analysis: Concept of Risk, Types of Risk- Systematic risk, Unsystematic risk, Risk and return trade-off, Portfolio and Single asset Returns and Risk, Mean-Variance Criterion covariance, Beta (simple problems), Risk and Return with Different correlation, Sharpe's Single Index Model, Sharpe's Optimal Portfolio Construction of the Optimal Portfolio.

Unit V: Portfolio Management: Asset Pricing Model Capital Asset Pricing Model (CAPM), Security Market Line - Assumptions Arbitrage Pricing Model (APT), Portfolio Performance Models, Sharpe's Performance Index, Treynor's Performance Index, Jensen's Performance Index.

Suggested Readings

1. Kevin,S.(2019) **Security Analysis and Portfolio Management**, PHI Learning Pvt. Ltd. Latest Edition
2. Shashidharan, K. (2019) **Security Analysis and Portfolio Management**, Tata McGraw Hill. Latest Edition
3. Fisher, Jordon,(2018) **Security Analysis and Portfolio Management**. Latest Edition
4. Bhatt, (2011) **Security Analysis & Portfolio Management**, Wiley Publication. Latest Edition
5. Avadhani, (2019) **Security Analysis & Portfolio Management**, Himalaya Publication. Latest Edition
6. Bhat,S. (2018) **Security Analysis and Portfolio Management**, Excel books. Latest Edition

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B.Com. - IV SEMESTER (2024-2027)

BCOMES401 INTRODUCTION TO MICRO FINANCE

CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								CREDITS	
		THEORY			PRACTICAL		L	T	P		
		END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*					
BCOMES401	MAJ/MIN	Introduction to Micro Finance	60	20	20	-	-	3	-	-	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; **MAJ/MIN-** Major/Minor Course

***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives

This course introduces students to the practices of MFIs in a variety of different developing countries. It identifies the wide varieties of practices and governance structures of these organizations, and the issues they confront.

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of five questions. Each question will carry 12 Marks and consist of four questions, out of which student will be required to attempt either question number (a) and (b) or question number (c) and (d).

Each question i.e. (a), (b), (c) and (d) will be of 6 marks.

Course Outcomes

- CO1** Understand the innovative concept of micro finance and its approaches.
- CO2** Deep knowledge of micro finance as the key tool of financial inclusion, Government schemes and self help groups.
- CO3** Develop an insight and understanding of various products of micro finance.
- CO4** Practical knowledge of various regulatory guidelines and directives relating to Micro Finance
- CO5** Understanding of other evaluations of micro finance and microfinance ethics.

COURSE CONTENT

Unit I: An Introduction to Microfinance Demand and Supply of Microfinance – A Development Strategy and an Industry Role of Grameen Banks in Microfinance, Microfinance Innovative Concepts, Approaches and Financial Inclusion

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BCOMES401 INTRODUCTION TO MICRO FINANCE

Unit II: Introduction to financial inclusion: Financial Inclusion, Microfinance – the key tool of financial inclusion, Reasons for FI, Latest Schemes of Government like PMJDY, Atal Pension Yojana. Involvement of **self-help group (SHG)** in financial inclusion

Unit III: Products of Financial inclusion: Deposit and Credit Products, retail loans, MSME loans, Agri Loans, micro loans, features of each type of loan, Other Microfinance products offering – Beyond Credit: Introduction to products in addition to loans, e.g., savings, insurance, and education.

Unit IV: Regulatory framework: latest RBI Guidelines- NBFC-MFI (RBI)Directives 2015, KYC and Application, KYC process

Unit V: Other Evaluation of Microfinance Market Evaluation of Microfinance – Products and Services Pricing of Financial Services Legal and Regulatory Compliance in Microfinance Social Evaluation of Microfinance Role of Ethics in Microfinance. Various documentations in micro finance.

Suggested Readings

1. Rana O.C., HemRaj (2016), *Microfinance*, Himalaya Publishing House
2. Branch, Brian & Janette Klaehn (2002), *Striking the Balance in Microfinance: A Practical Guide to Mobilizing Savings*. PACT Publications, Washington.
3. Dowla, Asif, Dipal Barua(2006). *The Poor Always Pay Back: The Grameen II Story*. Kumarian Press Inc., Bloomfield, Connecticut.
4. Hirschland, Madeline (ed.) (2005) *Savings Services for the Poor: An Operational Guide*. Kumarian Press Inc., Bloomfield CT.
5. Ledgerwood, Joanna and Victoria White (2006), *Transforming Microfinance Institutions: Providing Full Financial Services to the Poor*. World Bank.
6. Rutherford, Stuart (2000), *The Poor and Their Money*. Oxford University Press, Delhi.



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Choice Based Credit System (CBCS) in Light of NEP-2020

B.Com. - IV SEMESTER (2024-2027)



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of the Program: BCA +MCA in Banking Technology

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teacher's Assessment*	END SEM University Exam	Teacher's Assessment*
BCCA105	Compulsory	Programming Methodology and C	3	1	0	4	60	20	20	0	0

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives (CEOs):

- To familiarize the students with programming and to encourage them to develop their logic.
- To make students well versed with C language to solve problems efficiently.
- Using simple and well drawn illustrations develop their programming skills using modular programming.
- To cover the various data structures and their applications.

Course Outcomes (COs):

Student will be able to:

- Develop algorithms for problems.
- Apply the programming concepts to solve the given problems.
- Write the programs using modular programming.
- Understand and write programs using various data structures very efficiently.
- Write the programs using pointers and to manage memory.
- Implement programs of file handling.

Unit-I

An overview: Problem identification, analysis, design, coding, testing & debugging, implementation, modification & maintenance; algorithms & flowcharts; Characteristics of a good program - accuracy, simplicity, robustness, portability, minimum resource & time requirement, modularization; Rules/ conventions of coding, documentation, naming variables; Top down design; Bottom-up design.

Unit-II

Fundamentals of C Programming: History of C; Structure of a C Program; Data types; Constant

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BCCA105	Compulsory	Programming Methodology and C	3	1	0	4	60	20	20	0	0

& Variable, naming variables; Operators & expressions; Control Constructs – if-else, for, while, do-while; Case switch statement; Arrays; Formatted & unformatted I/O; Type modifiers & storage classes; Ternary operator; Type conversion & type casting; Priority & associativity of operators.

Unit-III

Modular Programming: Functions; Arguments; Return value; Parameter passing – call by value, call by reference; Return statement; Scope, visibility and life-time rules for various types of variable, static variable; Calling a function; Recursion – basics, types of recursion- direct, indirect.

Unit-IV

Advanced Programming Techniques: Special constructs – Break, continue, exit (), goto& labels; Pointers - & and * operators, pointer expression, pointer arithmetic, dynamic memory management functions like malloc(), calloc(), free(); String; Pointer v/s array; Structure – basic, declaration, membership operator.

Unit-V

Miscellaneous Features: printf & scanf family; C preprocessor – basics, #Include, #define, #undef, conditional compilation directive like #if, #else, #elif, #endif, #ifdef and #ifndef

Text Books:

1. KanitkarYashwant, 'Let us C', BPB New Delhi
2. Balaguruswami, 'Ansii C', TMH, Delhi
3. Kerninghan& Ritchie "The C programming language", PHI
4. Schildt "C:The Complete reference" 4th ed TMH.
5. Cooper Mullish "The Spirit of C", Jaico Publishing House, Delhi



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COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teacher's Assessment*	END SEM University Exam	Teacher's Assessment*
BCCA106	Compulsory	Programming Lab using C	0	0	4	2	0	0	0	30	20

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives (CEOs):

- To familiarize the students with programming and to encourage them to develop their logic.
- To make students well versed with C language to solve problems efficiently.
- Using simple and well drawn illustrations develop their programming skills using modular programming.
- To cover the various data structures and their applications.

Course Outcomes (COs):

Student will be able to:

- Develop algorithms for problems.
- Apply the programming concepts to solve the given problems.
- Write the programs using modular programming.
- Understand and write programs using various data structures very efficiently.
- Write the programs using pointers and to manage memory.
- Implement programs of file handling.

List of Experiments:

- Define an algorithm and flowchart. Draw algorithm and flow chart for a program that converts an input Fahrenheit degree into Celsius equivalent.
- Write an algorithm and a C program to find the greatest among three numbers.
- WAP to print an input string in lower case, upper case and mixed case using library function.

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Name of the Program: BCA +MCA in Banking Technology

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BCCA106	Compulsory	Programming Lab using C	0	0	4	2	0	0	0	30	20

4. WAP to read in a three digit number produce following output (assuming that the input is 679)
 6 hundreds
 7 tens
 9 units
5. WAP a C program to reverse an input number.
6. Draw a flow chart to find prime number from 1 to 100.
7. WAP to find factorial of accepted number.
8. WAP to calculate factorial of a number using recursion.
9. WAP in C to generate Fibonacci series.
10. WAP in C to generate Pascal triangle.
11. WAP in C to swap values of two variables.
12. WAP in C to search a given element in an array using linear search.
13. WAP to sort an integer array in ascending and descending order according to user's choice.
14. Write a menu driven program to perform matrix addition, subtraction and multiplication.
15. WAP a C program to reverse a string by recursion.
16. WAP to read and write a structure.

Text Books:

1. Kanitkar Yashwant, 'Let us C', BPB New Delhi
2. Balaguruswami, 'Ansi C', TMH, Delhi
3. Kerninghan & Ritchie "The C programming language", PHI
4. Schildt "C:The Complete reference" 4th ed TMH.
5. Cooper Mullish "The Spirit of C", Jaico Publishing House, Delhi



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Choice Based Credit System (CBCS) in Light of NEP-2020

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BCOMBA401 OPERATION RESEARCH FOR BUSINESS DECISIONS – II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BCOMBA 401	MAJ/MIN	Operation Research for Business Decisions – II	60	20	20	-	-	3	-	-	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; **MAJ/MIN-** Major/Minor Course

***Teacher Assessment** shall be based on the following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective

This course aims to build upon the concepts of Operations Research (OR) learned in the prerequisite course, focusing on advanced techniques and methodologies for addressing complex decision-making problems in business and management. Students will gain practical experience in applying optimization, simulation, and other OR tools to solve real-world problems and improve organizational performance.

Examination Scheme

The internal assessment of the student's performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of five questions. Each question will carry 12 Marks and consist of four questions, out of which students will be required to attempt either question number (a) and (b) or question number (c) and (d). Each question i.e. (a), (b), (c), and (d) will be of 6 marks.

Course Outcomes

- CO1** Understand the principles and techniques of deterministic and stochastic optimization.
- CO2** Develop simulation models to analyze and improve the performance of complex systems and processes.
- CO3** Use game theory concepts to analyze competitive situations and strategic decision-making.
- CO4** Apply advanced network models, such as PERT/CPM, to optimize project scheduling and resource allocation.
- CO5** Critically evaluate and communicate the results of OR analyses to support effective decision-making in business contexts.

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Shri Vaishnav Institute of Commerce

Choice Based Credit System (CBCS) in Light of NEP-2020

B.Com. - IV SEMESTER (2024-2027)

BCOMBA401 OPERATION RESEARCH FOR BUSINESS DECISIONS – II

COURSE CONTENTS

UNIT I: Game Theory: Introduction, Basic Concepts, Terminologies in Game Theory, Two Person Zero Sum Game, Algebraic Method, Pure Strategies: Game with Saddle Point, Two-Person-Zero-Sum Games of $2 \times m$ and $n \times 2$, Limitations of Games in Competition

UNIT II: Sequencing: Introduction, Terminology, Types of Sequencing Problems, Algorithm for Sequencing Problems, Type I: Processing n Jobs through Two Machines, Type II: Processing n Jobs through Three Machines,

UNIT III: Replacement Theory: Need for Replacement, Consideration of Money Value for Investments on Machines or Equipment, Replacement Policy Decisions

UNIT IV: PERT, CPM: Introduction to Construction of Networks, Rules in Constructing Network, Critical Path Method (CPM), Time Estimates: Earliest Time and Latest Time, Determination of Floats and Slack Times, Project Evaluation Review Technique (PERT), Determination of PERT Times

UNIT V: Simulation Techniques: Introduction to simulation as an aid to decision-making- Advantages and Disadvantages of Simulation - Applications of simulation models - Types: Inventory. Cash and Project - Random Numbers.

Suggested Readings

1. Hillier F. S., Lieberman, G. J. (2014). *Introduction to Operations Research* (10th ed.). McGraw-Hill Education.
2. K. Swarup P., Gupta P. K., Man Mohan (2018). *Operations Research: Theory and Applications*. Sultan Chand & Sons.
3. Render B., Stair R. M., Hanna M. E. (2018). *Quantitative Analysis for Management* (13th ed.). Pearson.
4. Sharma J. K. (2017). *Operations Research: Theory and Applications*. Macmillan Publishers India.
5. Taha H. A. (2016). *Operations Research: An Introduction* (10th ed.). Pearson.
6. Van Slyke, R. M., Wets, R. J. (2001). *Linear and Nonlinear Programming* (3rd ed.). Springer.
7. Winston W. L. (2003). *Operations Research: Applications and Algorithms* (4th ed.). Cengage Learning.
8. Young H. P. (2004). *Strategic Learning and Its Limits*. Oxford University Press.

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