



# Shrimathi Devkunvar Nanalal Bhatt Vaishnav College For Women (Autonomous)

Owned and Managed by Cork Industries Charities Trust  
Affiliated to University of Madras - Re-Accredited with 'A+' Grade by NAAC - 4th Cycle

## COURSE DATA SHEET

|                                  |                                |                    |                              |
|----------------------------------|--------------------------------|--------------------|------------------------------|
| <b>SEMESTER</b>                  | <b>II</b>                      | <b>BATCH</b>       | 2026                         |
| <b>COURSE NAME</b>               | <b>Quantitative Techniques</b> | <b>COURSE CODE</b> | 26UCOGE1D02                  |
| <b>COURSE UNITS</b>              | 5                              | <b>COURSE TYPE</b> | Generic<br>Elective(GE) - II |
| <b>CONTACT HOURS<br/>(L-T-P)</b> | 75                             | <b>CREDITS</b>     | 5                            |
| <b>OFFERED BY</b>                | B.Com (Commerce)               | <b>SHIFT</b>       | 8:20 – 12:50 pm              |

| <b>COURSE OBJECTIVES</b> |                                                                                                                    |
|--------------------------|--------------------------------------------------------------------------------------------------------------------|
| 1                        | To introduce the concepts and applications of quantitative techniques in business and management.                  |
| 2                        | To develop analytical and logical thinking skills among commerce students.                                         |
| 3                        | To familiarize students with probability, transportation, assignment, inventory and project management techniques. |
| 4                        | To develop the concept of Set theory with Venn diagram, AM & GM for financial decision making.                     |
| 5                        | To develop decision-making abilities through optimization and practical business applications.                     |

| <b>COURSE OUTCOMES: On completion of the course the students will be able to...</b> |                                                                                                                                  |                        |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|------------------------|
|                                                                                     | <b>CO Statement</b>                                                                                                              | <b>Cognitive Level</b> |
| <b>CO1</b>                                                                          | Formulate and solve Linear Programming Problems using graphical methods                                                          | K3                     |
| <b>CO2</b>                                                                          | Explain the concepts of probability and its role in business decision making                                                     | K4                     |
| <b>CO3</b>                                                                          | Apply transportation and assignment techniques for optimization problems.                                                        | K5                     |
| <b>CO4</b>                                                                          | Apply set theory using Venn diagrams, solve arithmetic and geometric series problems for business and financial decision-making. | K4                     |



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|            |                                                                                               |    |
|------------|-----------------------------------------------------------------------------------------------|----|
| <b>CO5</b> | Apply PERT, CPM and basic queuing models for project scheduling and service system management | K4 |
|------------|-----------------------------------------------------------------------------------------------|----|

### **SYLLABUS**

| UNIT          | TOPICS                                                                                                                                                                           | HOURS     |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1             | Introduction to Operations Research- Meaning and application of Linear programming Problems, Formulation of Linear programming Problems- Graphical Methods- Simple Problems only | 15        |
| 2             | Meaning and Concept of Probability – Addition and Multiplication theorem – Conditional Probability – Simple Problems only                                                        | 15        |
| 3             | Transportation Problem: Finding Initial basic feasible solution by North-west corner rule, Least Cost Method, Vogel's Approximation Method- MODI method.                         | 15        |
| 4             | Set theory- Set operation only through Venn diagram- Series- Arithmetic, Geometric series- Concept of Interest- Annuity formula.                                                 | <u>15</u> |
| 5             | Network Analysis- PERT and CPM (no crashing)- simple problems.                                                                                                                   | <u>15</u> |
| Note (if any) | .                                                                                                                                                                                |           |

### **TEXT/REFERENCE BOOKS/E - RESOURCES:**

|                            |                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Text Books</b>          | Business statistics and Operations Research- Dr. P.R. Vittal, Margham Publication, 3 <sup>rd</sup> Edition                                                                                                                                                                                                                                                                                     |
| <b>Books For Reference</b> | <ol style="list-style-type: none"> <li>1. S.P. Gupta- Statistical Methods- Sultan 46<sup>th</sup> Edition 2023.</li> <li>2. Introduction to Operation Research- Dr. P.R. Vittal, Margham Publication, 2012.</li> <li>3. Sundaresan V., Ganapathy Subramanian K.S. &amp; Ganesan, K., Resource Management Techniques' (Operations Research), A. R. Publications, Tenth Edition 2016.</li> </ol> |



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|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | <p>4. P.K. Gupta and D.S. Hira -Operations Research - S. Chand Publication, 2021.</p> <p>5. Hamdy A. Taha-Operation Research An Introduction– Pearson Education Limited, 11<sup>th</sup> Edition, 2025</p>                                                                                                                                                                                                                                                     |
| <b>E-Learning Resources</b> | <p>1. NPTEL – <a href="https://nptel.ac.in">https://nptel.ac.in</a></p> <p>2. SWAYAM – <a href="https://swayam.gov.in">https://swayam.gov.in</a></p> <p>3. Khan Academy – <a href="https://www.khanacademy.org">https://www.khanacademy.org</a></p> <p>4. GeeksforGeeks – <a href="https://www.geeksforgeeks.org">https://www.geeksforgeeks.org</a></p> <p>5. TutorialsPoint – <a href="https://www.tutorialspoint.com">https://www.tutorialspoint.com</a></p> |

### PEDAGOGY (TEACHING METHODOLOGY):

- Chalk and Talk
- Online Coaching
- LCD
- Assignment
- Seminar
- Quiz
- Group discussion

### CO-PO AND CO-PSO MAPPING:

|                                                                           | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |  | PSO1 | PSO2 | PSO3 |
|---------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|--|------|------|------|
| CO1                                                                       | 3   | 2   | 2   | 1   | 2   | 1   |  | 2    | 3    | 2    |
| CO2                                                                       | 2   | 1   | 3   | 2   | 3   | 1   |  | 3    | 2    | 3    |
| CO3                                                                       | 2   | 1   | 3   | 2   | 3   | 1   |  | 3    | 2    | 3    |
| CO4                                                                       | 3   | 1   | 2   | 2   | 3   | 2   |  | 3    | 3    | 2    |
| CO5                                                                       | 2   | 2   | 3   | 2   | 3   | 2   |  | 2    | 3    | 2    |
| <b>Average<br/>(Use only<br/>filled in<br/>cells for<br/>calculation)</b> | 2.4 | 1.4 | 2.4 | 1.8 | 2.8 | 1.4 |  | 2.8  | 2.4  | 2.6  |

**Correlation Level:**    Strong-3        Moderate-2    Weak-1        No Correlation-0



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### JUSTIFICATION OF CO-PO/PSO MAPPING

| CO  | PO/PSO | Level of correlation | Justification                                                                                                                                      |
|-----|--------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | PO1    | 3                    | To foster clarity in concepts, confidence in domain knowledge application, and assertiveness in decision-making across various opportunities.      |
|     | PO2    | 2                    | Develop life skills for logical appraisal and decision-making through deeper understanding.                                                        |
|     | PO3    | 2                    | Incorporate probability theory to design effective solutions for complex societal challenges.                                                      |
|     | PO4    | 1                    | Foster a program-centric thought process through the study of probability, facilitating further specialization in the respective domain.           |
|     | PO5    | 2                    | To promote lifelong learning, adaptability, and readiness for specialized fields in a dynamic environment.                                         |
|     | PO6    | 1                    | Integrate probability theory to cultivate self-awareness, ethical values, and compassion in decision-making.                                       |
|     | PSO1   | 2                    | To comprehend the foundational concepts, principles, and practices essential for successful business ventures.                                     |
|     | PSO2   | 3                    | To enhance analytical skills crucial for pursuing professional courses like CA, ICWA, and ACS.                                                     |
|     | PSO3   | 2                    | To bridge academic theory with practical business applications, facilitating the integration of knowledge between academia and the business world. |
| CO2 | PO1    | 2                    | Develop clarity in concepts, confidence in domain knowledge, and assertiveness through mastering sampling techniques.                              |
|     | PO2    | 1                    | Enhance life skills and logical reasoning abilities through an in-depth exploration.                                                               |
|     | PO3    | 3                    | To design effective solutions for complex societal challenges.                                                                                     |
|     | PO4    | 2                    | To cultivate a program-centric approach conducive to further domain studies through comprehensive exploration of sampling techniques.              |
|     | PO5    | 3                    | Foster lifelong learning and adaptability, enhancing clarity and preparedness for specialized fields through the study.                            |
|     | PO6    | 1                    | Enhance life skills and logical reasoning abilities.                                                                                               |
|     | PSO1   | 3                    | To gain insights into business ventures by understanding the fundamental concepts, principles, and practices.                                      |



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|     |      |   |                                                                                                                                   |
|-----|------|---|-----------------------------------------------------------------------------------------------------------------------------------|
|     | PSO2 | 2 | Equip students with the analytical skills needed for professional courses like CA, ICWA, and ACS through the comprehensive study. |
|     | PSO3 | 3 | Bridge academia with the business world by mastering sampling techniques, facilitating effective data-driven decision-making.     |
| CO3 | PO1  | 2 | Develop clarity, confidence, and assertiveness in applying domain knowledge through the study.                                    |
|     | PO2  | 1 | Enhance life skills and logical reasoning abilities through deeper understanding of hypothesis testing techniques.                |
|     | PO3  | 3 | Foster the ability to tackle societal challenges by employing hypothesis testing methods to develop innovative solutions.         |
|     | PO4  | 2 | Empower students to address societal issues through hypothesis testing, fostering innovative problem-solving skills.              |
|     | PO5  | 3 | Develop clarity, confidence, and assertiveness in applying domain knowledge through the study.                                    |
|     | PO6  | 1 | Promote self-awareness and ethical development by integrating moral values into hypothesis testing methodologies.                 |
|     | PSO1 | 3 | Gain a comprehensive understanding of business ventures by mastering hypothesis testing methodologies.                            |
|     | PSO2 | 2 | Prepare for professional courses like CA, ICWA, and ACS through the application of hypothesis testing principles.                 |
|     | PSO3 | 3 | Bridge academia and business realms by applying hypothesis testing techniques to real-world scenarios.                            |
| CO4 | PO1  | 3 | Enhance conceptual clarity and confidence in applying domain knowledge through techniques.                                        |
|     | PO2  | 1 | To develop life skills, including logical reasoning, through the study.                                                           |
|     | PO3  | 2 | Utilize techniques to engineer innovative solutions addressing complex societal challenges.                                       |
|     | PO4  | 2 | Foster a program-centric approach, aiding further study in specialized domains.                                                   |
|     | PO5  | 3 | Develop adaptable skills and readiness for specialized fields by engaging in lifelong learning.                                   |



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|     |      |   |                                                                                                                                                                  |
|-----|------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | PO6  | 2 | Foster ethical and compassionate decision-making through self-regulation and moral focus.                                                                        |
|     | PSO1 | 3 | Explore the operational intricacies vital for business success, encompassing logistics and resource allocation strategies.                                       |
|     | PSO2 | 3 | Develop foundational skills applicable across diverse professional domains, aligning with the comprehensive approach demanded by courses like CA, ICWA, and ACS. |
|     | PSO3 | 2 | Facilitate the integration of academic insights into practical business logistics, fostering a symbiotic relationship between academia and the business real.    |
| CO5 | PO1  | 2 | Develop a comprehensive understanding of network analysis principles to confidently navigate complex systems and make informed decisions                         |
|     | PO2  | 2 | To Enhance critical thinking abilities and apply logical reasoning in various life situations for personal growth.                                               |
|     | PO3  | 3 | Address societal issues by formulating innovative solutions through strategic problem-solving approaches.                                                        |
|     | PO4  | 2 | Foster advanced analytical skills essential for future academic pursuits and specialized domain knowledge.                                                       |
|     | PO5  | 3 | Enhance adaptability and readiness for specialized fields by mastering network analysis techniques in a dynamic learning environment.                            |
|     | PO6  | 2 | Develop the critical thinking abilities and apply logical reasoning in various life situations for personal growth                                               |
|     | PSO1 | 2 | Explore the application of network analysis in understanding and optimizing business operations and strategies.                                                  |
|     | PSO2 | 3 | Incorporate network analysis to enhance decision-making skills vital for professional courses in finance and accounting.                                         |
|     | PSO3 | 2 | Utilize network analysis to bridge academia and business, fostering collaboration and innovation.                                                                |



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