CMR UNIVERSITY
Private University Established in Karnataka State by Act No. 45 of 2013

School of Science and Computer Studies

BCA (Game Development)

Course Outcomes (COs)
Batch [2023-26]

CMR UNIVERSITY BANGALORE

BCA (GD) Programme

First Semester

8CSPL1441 : C++ Programming and Lab
CO1: Devise solutions for problems using C++ (Level 1) **CO2**: Understand the use of C++ basics, objects and types, inheritance(Level 2) CO3: Design and develop programs using concepts of inheritance and virtual functions (L6) CO4: Implementation of C++ files and streams (L6) CO5: Working with C++ templates (L6)

8CSGC1581: Data Structures and Lab
CO1: understand data structures used in Game Development (L2) **CO2**: Accomplice faster searching and sorting of data (L2,L3)) **CO3**: implement various operations on linked lists (L3) **CO4:** Implement various operations on stack and Queues and solve application problems(L3) **CO5**: Implement the tree and Graphs in Data Structure (L3)

8MATH1041: Mathematics
CO1: Apply Matrices and Vector concepts in Game programming (Level 3) **CO2**: Apply Trigonometry and Logic concepts in Game programming (level 3) **CO3**: Apply 2D Transformations, 3D Transformations and Quaternion's concepts in Game programming (Level 3) **CO4**: Apply principles and concepts of Graph theory in practical situations and also will be able to formulate the concepts as a base for other related courses. (Level 3)

SECOND SEMESTER

8CSPL2411: C# Programming and Lab
CO1: Introduce the basics of Computer (Level 1)
CO2: Demonstrate the understanding of C# programming language concepts (Level 2)
CO3: Design and develop programs using decision making, and looping statements(Level 4)
CO4: Define, develop and analyze the concepts like arrays, strings and user defined functions. (Level 3)
CO5: To be able to manage errors. (Level 2)
CO6: To use in Object-Orient Design Concepts. (Level 3)

8CSGC1461: Database Management Systems and Lab
CO1: Gain knowledge on fundamentals of a database system.(L2)
CO2: Build relational model using Entity Relationship diagrams for real life systems(L3,L6)
CO3: Organize data by eliminating redundancy and inconsistencies by applying normalization.(L3)
CO4: Develop complex queries using SQL and PL/SQL to store,manipulate and data from database. (L3,L4,L6)
CO5: Gain knowledge on transaction processing and concurrency control in database design. (L2)

8CSAI3121: Artificial Intelligence
CO1: To be able to design agent programs for task environments
CO2: To be able to use appropriate search technique for given problem
CO3: To be able to use probability and fuzzy logic to design games
CO4: To apply finite state machine concepts in simulation of games
CO5: To develop games using Rule based AI

CMR UNIVERSITY BANGALORE

Third Semester

8CSGD1011: Game Design (Introduction to Level Design)
CO1: Understand the principles of game design. (Level 1)
CO2: Generate ideas for board games and make a prototype. (Level 2)
CO3: Students will gain a working knowledge of Photoshop and develop their skills in editing and altering photographs through a basic understanding of the tool bar, layers, and the adjustments panel. (Level 3)
CO4: Understanding the Importance and creation of the Game Design Document. (Level 4)

8CSGD1021: Game Development–I (Introduction to Unity and Construct 2 Engine)
CO1: Demonstrate skills in Unity Game Engine (Level 1)
CO2: Apply C# programming in Unity for Game development (Level 2)
CO3: Develop User Interface for Game using Unity (Level 4)
CO4: Develop small 2D Game in unity3D using C# Programming Language (Level 3)

8CSGD1031: Human Computer Interaction in Game Design
CO1: Design and evaluate user interfaces for various gaming platforms (Level 1)
CO2: Conduct effective playtesting and user research for games(Level 2)
CO3: Understand player psychology and its impact on game design (Level 3)
CO4: Able to differentiate different game development. (Level 2)
CO5: Design and evaluate user interfaces for various gaming platforms (Level 2)

Fourth Semester

8CSPL3481: Java Programming for Game Development and Lab
CO1: Interpret various object oriented principles in the software design process. (Level 2)
CO2: Analyze the importance of classes and inheritance. (Level 4)
CO3: Impart the concepts of packages, threads ,interfaces and exception Handling .(Level 2)
CO4: Able to differentiate different game development. (Level 2)
CO5: Design and evaluate user interfaces for various gaming platforms (Level 2)

8CSGD2051 : Game Design-2(Advanced concepts in Level Design)
CO1: Demonstrate skills in Unity Game Engine (Level 2)
CO2: Apply C# programming in Unity for Game development (Level 3)
CO3: Develop User Interface for Game using Unity (Level 4)
CO4: Develop small 2D Game in unity3D using C# Programming Language (Level 5)

8CSGD2041 : Game Development-2 (Advanced Concepts in Unity)
CO1: Demonstrate skills in Unity Game Engine (Level 2)
CO2: Apply C# programming in Unity for Game development (Level 3)
CO3: Develop User Interface for Game using Unity (Level 4)
CO4: Develop small 2D Game in unity3D using C# Programming Language (Level 5)

School of Science and Computer Studies

BCA (Game Development)

COURSE OUTCOMES : Batch [2024-27]

SEMESTER I

8CSPL1321: Problem Solving Techniques Using C and Lab
CO1: Devise algorithms and draw flowcharts for solving problems problems (L3,L6) **CO2**: Apply C programming syntax and semantics for problem solution(L3) **CO3**: Design and develop programs using decision making and looping statements.(L6) **CO4**: Define and develop problem solution using functions, structures, union and pointers (L6) **CO5**: Develop programs using file concepts in simple data processing applications. (L6)

8CSGC1461: Database Management Systems and Lab
CO1: Gain knowledge on fundamentals of a database system.(L2) **CO2:** Build relational model using Entity Relationship diagrams for real life systems(L3,L6) **CO3**: Organize data by eliminating redundancy and inconsistencies by applying normalization.(L3) **CO4**: Develop complex queries using SQL and PL/SQL to store,manipulate and data from database. (L3,L4,L6) **CO5**: Gain knowledge on transaction processing and concurrency control in database design. (L2)

8MATH1031:Mathematical Foundation for Computer Science
CO1: Solve problems in the language of sets and perform set operations, apply basic concepts and prove facts about ordinals and well ordered sets. (L3) **CO2**: Apply and interpret properties of linear systems and will be able to solve them by matrix techniques. (L3) **CO3**: Apply logical concepts in the field of Computer Science. (L3) **CO4:** Apply principles and concepts of Graph theory in practical situations and also will be able to formulate the concepts as a base for other related courses. (L3)

CPSSF1011: French –Level-1
CO1: Introduce themselves and others, and use common French salutations appropriately.(L1,L2)
CO2: Use polite expressions in French appropriately in social interactions. (L2)
CO3: Discuss daily activities with improved fluency and accuracy (L3)
CO4: Identify and use parts of speech correctly in sentences.

CPSSF1041: Spanish –Level-1
CO1: Introduce themselves and others, and use common Spanish salutations appropriately.(L1,L2)
CO2: Use polite expressions in Spanish appropriately in social interactions. (L2)
CO3: Discuss daily activities with improved fluency and accuracy (L3)
CO4: Identify and use parts of speech correctly in sentences.

FUNCTIONAL ENGLISH Course Code: CPSAL1111 Batch:2024
CO1: Define Social Values and Critical Thinking skills (L1)
CO2: Compare the poetical terms and integrate creative ideas in the English Language. (L2) CO3: Develop vocabulary and interpret in one academic and professional life.(L2)
CO4: Develop skills of comprehending and analytical to improve their language proficiency. (L3) CO5: Construct sentences to improve their Verbal Skills.(L3)

ಕನ್ನಡ ಕಲಿ-ನಲಿ		
Course Name: ಕನ್ನಡ		
Course Code: CPSAL1101		
A. Course Framework		
Credits: L-T-P-C: 2-0-0-2		Syllabus Version: 1
Contact Hours / Week: 2	Total Contact Hours: 30	Level: 100
Prerequisite: (If applicable)		
Course Learning Objectives:		
CLO1: ಕನ್ನಡ ಅಕ್ಷರ ಮಾಲೆಯನ್ನು ಪರಿಚಯಿಸುವುದು.		
CLO2: ಕನ್ನಡ ಅಕ್ಷರಗಳ ಉಚ್ಚಾರಣೆಯ ಬಗೆಗೆ ತಿಳಿಸುವುದು.		
CLO3: ಕನ್ನಡ ಗುಣಿತಾಕ್ಷರಗಳ ರಚನೆಯ ಬಗ್ಗೆ ತಿಳಿಸುವುದು.		
CLO4: ಕನ್ನಡ ಲಿಂಗ, ವಚನಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.		
CLO5: ಕನ್ನಡ ಭಾಷೆಯಲ್ಲಿ ಸರಳ ಪದ ರಚನೆ ಮತ್ತು ವಾಕ್ಯ ರಚನೆಯ ಬಗ್ಗೆ ತಿಳಿಸುವುದು.		
Course Outcomes: On successful completion of the course, Students will be able to,		
CO1: [Level2] ಕನ್ನಡ ಅಕ್ಷರ ಮಾಲೆಯ ಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳುತ್ತಾರೆ.		
CO2: [Level 4] ಕನ್ನಡ ಅಕ್ಷರಗಳ ಉಚ್ಚಾರಣೆಯ ಬಗೆಗೆ ಅರಿತುಕೊಳ್ಳುತ್ತಾರೆ.		
CO3: [Level 4] ಕನ್ನಡ ಗುಣಿತಾಕ್ಷರಗಳ ರಚನೆಯ ಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳುತ್ತಾರೆ.		
CO4: [Level 5,6] ಕನ್ನಡ ಭಾಷೆಯಲ್ಲಿನ ಲಿಂಗ, ವಚನಗಳ ಸ್ವರೂಪವನ್ನು ಅರ್ಥೈಸಿಕೊಳ್ಳುತ್ತಾರೆ.		
CO5: [Level4] ಕನ್ನಡ ಭಾಷೆಯಲ್ಲಿ ಸರಳ ಪದ ಮತ್ತು ವಾಕ್ಯ ರಚನೆಯನ್ನು ಪ್ರಯೋಗಿಸುತ್ತಾರೆ.		
B. Syllabus		
Module:1: ಕನ್ನಡ ಅಕ್ಷರ ಮಾಲೆ		5 Hours
ಸ್ವರಗಳು, ವ್ಯಂಜನಗಳು, ಯೋಗವಾಹಕಗಳು, ವರ್ಗೀಯ ವ್ಯಂಜಗಳು ಮತ್ತು ಅವರ್ಗೀಯ ವ್ಯಂಜನಗಳು		
Module:2: ಗುಣಿತಾಕ್ಷರಗಳು		8 Hours
ಕ-ಳ ಗುಣಿತಾಕ್ಷರಗಳ ಸ್ವರೂಪ		
Module:3: ಒತ್ತಕ್ಷರಗಳು		6 Hours
ಸ್ವಜಾತೀಯ ಒತ್ತಕ್ಷರಗಳು, ವಿಜಾತಿಯ ಒತ್ತಕ್ಷರಗಳು		
Module:4: ಕನ್ನಡ ಭಾಷೆಯಲ್ಲಿ ಲಿಂಗ ಮತ್ತು ವಚನಗಳು		6 Hours
ಪುಲ್ಲಿಂಗ, ಸ್ತ್ರೀಲಿಂಗ, ನಪುಂಸಕ ಲಿಂಗ, ಏಕವಚನ, ಬಹುವಚನ		
Module:5: ಸರಳ ಪದ ಮತ್ತು ವಾಕ್ಯ ರಚನೆ		5 Hours
ಎರಡು ಅಕ್ಷರಗಳ ಪದಗಳು, ಮೂರು ಅಕ್ಷರಗಳ ಪದಗಳು, ಸರಳ ವಾಕ್ಯ		

Course Code: CPSAD1013 Course Name: Design Thinking Process
CO1: Implement design thinking methodologies to identify and address complex problems.**(Level 3) CO2:** Empathize with users and stakeholders to understand their needs effectively.**(Level 2)** **CO3:** Generate innovative ideas by engaging in ideation and prototyping processes**(Level 5) CO4:** Effectively communicate solutions using pitching techniques. **(Level 4)**

CKSAM1051: Indian Democracy, Participation & Social Change 2024
CO1: Study a particular event in Indian history and trace the impact that can be felt to the present day. CO2: Understand the impact of the way a democracy is structured. CO3: Understand the freedoms that a citizen of India has, and what those mean in daily life. CO4: Understand the duties of an Indian citizen and how they translate to daily life. CO5: Gain an understanding of the workings of the government in their residential locality. CO6: Trace the impact of a single vote from their area of residence to the national scale. CO7: Understand the Indian democratic process and their role in it. CO8: Identify ways in which they can contribute to the progress of the country.

SEMESTER 2

8CSGC2391: Data Structures Using C and Lab
CO1: Select appropriate data structures as applied to specified problem definition.(L3) **CO2**: Implement Linear and Non-Linear data structures.(L3) **CO3**: Apply algorithms for sorting/searching technique for given problem.(L3) **CO4**: Implement operations like searching, insertion, deletion, traversing on various data structures.(L4) **CO5**: Implement the concept of Dynamic memory allocation.(L4) **CO6**: Design advance data structure using Non Linear data structure.(L4)

8CSPL1341: OPERATING SYSTEM AND LINUX FOUNDATION AND LAB
CO1: Identify the structure of the operating system, CPU scheduling with different scheduling algorithms (Level 2) **CO2:** Identify the classic problems of Synchronization. (Level 2) **CO3:** Analyze different methods of handling deadlocks , the memory management and its allocation policies.(Level 4) **CO4**: Demonstrate file management, secondary storage structure and its various allocation methods.(Level 3) **CO5:** Apply the concepts of Linux programming. (Level 3)

8STAT2041: Statistics
CO1: Organize data and present it in the form of diagrams and graphs.(L3: Apply) **CO2**: Solve the problems related to Measures of Central Tendency-Mean-Median-Mode. (L3) **CO3**: Solve the problems related to Measures of Dispersion-Range-Quartile Deviation-Mean Deviation and Standard Deviation. (L3) **CO4:** Solve the problems related to Correlation and Regression, interpret the direction and degree of association between two variables and also will be able to predict the value of one variable with the help of the known value of another variable. (L3) **CO5:** Formulate the trend values which enables in predicting the future values with the help of previous data's. (L3: Apply)

CPSAL1061 : Hindi

A. Course Framework

Credit : L-T-P-C : 2 – 0 – 0 - 2		**Total Crédit : 2**
Contact Hours/Week : 2	**Direct Teaching Hour : 30**	**Total Contact Hour :30**

Course Learning Objectives : (सीखने का उद्देश्य)

CLO I : साहित्य के विविध पहलुओं का परिचय देने कहानी कविता और प्रायोगिक हिंदी पत्रकारिता संबंध सामग्री की गयी है |

CLO2 : पाठ्य सामग्री का चयन कुछ इस प्रकार किया गया है कि- विद्यार्थिय उसे अध्ययन करने के पश्चात् ऐसे मूल्य को जिस से राष्टीय एवं सामाजिक एकता का भाव संपुटित हो सके |

CLO 3 : भाषा विकास के विविध पक्षों का अनुप्रयोग करने हेतु श्रवण -मौखिक एवं लिखित कुशलता का अभ्यास |

Course Outcome : On successful completion of the course, students will be able to, (इस पाठ्यक्रमके अध्ययन के बाद विद्यार्थी निम्न तथ्यों से अवगत होगें)

CO1 : [**Level**] : इस सत्र के अंत तक विद्यार्थीयों को भाषायी कौशलता में उत्तरोत्तर विकास देखना |

CO 2 : [**Level**] हिंदी साहित्य की घनिष्ठता एवं उसकी विशदता का परिचय एवं उसका आश्वासन कराना

CO3 : बौद्धिक विकास के साथ -साथ निर्णयात्मक एवं सही गलत के बीच में अंतर परखने और उस पर दृढ़ता पूर्वक अपने विचारों को प्रकट करना एक मुख्य परिणाम होगा |

Course Name: ಕನ್ನಡ		
Course Code: CPSAL1071		
A. Course Framework		
Credits: L-T-P-C: 2-0-0-2		**Syllabus Version: 1**
Contact Hours / Week: 2	**Total Contact Hours: 30**	**Level: 100**
Prerequisite: (If applicable)		
Course Learning Objectives:		
CLO1: ಮಾನವನ ಸಂಬಂಧದಲ್ಲಿ ಪ್ರೀತಿಯ ಮಹತ್ವವನ್ನು ತಿಳಿಸುವುದು CLO2: ಜಾಗತಿಕರಣದ ಪ್ರಭಾವದಿಂದ ನಾಶವಾಗುತಿರುವ ಮಾನವೀಯ ಮೌಲ್ಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು CLO3: ಪ್ರಸ್ತುತ ರೈತರ ಸಮಸ್ಯೆಗಳನ್ನು ವಿವರಿಸುವುದು CLO4: ಪ್ರಕೃತಿಯೊಂದಿಗೆ ಮನುಷ್ಯನ ಸಂಬಂಧ ಮತ್ತು ಅದರ ಅಗತ್ಯತೆಯನ್ನು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ತಿಳಿಸುವುದು CLO5: ಜಗತ್ತಿನಲ್ಲಿ ತಂದೆ–ತಾಯಿಗಳೇ ಪೂಜ್ಯನೀಯ ಎಂಬುದನ್ನು ತಿಳಿಸುವುದು.		
Course Outcomes: On successful completion of the course, Students will be able to,		
CO1: [Level2] ಬದುಕನ್ನು ಮೌಲ್ಯದೊಂದಿಗೆ ಸಾಗಿಸುವ ವಿಧಾನವನ್ನು ಕಲಿಯುತ್ತಾರೆ. CO2: [Level 4] ಜೀವನದಲ್ಲಿ ದುಡ್ಡೆ ಮುಖ್ಯವಲ್ಲ ಮನುಷ್ಯತ್ವವು ಮುಖ್ಯವೆಂಬುದನ್ನು ತಿಳಿದುಕೊಳ್ಳುತ್ತಾರೆ. CO3: [Level 4] ಆಧುನಿಕದಲ್ಲಿ ಎಲ್ಲವನ್ನು ತಾಂತ್ರಿಕ ಸಹಾಯದಿಂದ ಸೃಷ್ಟಿಸಬವುದು ಆದರೆ ಆಹಾರವನ್ನಲ್ಲ ಎಂಬುದನ್ನು ಅರಿತು ಆ ಮೂಲಕ ರೈತರ ಸಮಸ್ಯೆಗಳ ಬಗೆಗೆ ಚಿಂತಿಸುತ್ತಾರೆ. CO4: [Level 5,6] ಇಂದಿಗೂ ಜೀವಂತವಾಗಿರುವ ಜಾತಿಪದ್ಧತಿಯನ್ನು ವೈಜ್ಞಾನಿಕವಾಗಿ ಅರ್ಥಮಾಡಿಕೊಳ್ಳುತ್ತಾರೆ. CO5: [Level4] ತಾಯಿಯ ಮಹತ್ವ ಮತ್ತು ತಾಯಿಯ ವಾತ್ಸಲ್ಯವನ್ನು ಅರಿತುಕೊಳ್ಳುತ್ತಾರೆ.		
B. Syllabus		
Module:1: ಪ್ರೀತಿ ಇಲ್ಲದ ಮೇಲೆ – ಜಿ.ಎಸ್ ಶಿವರುದ್ರಪ್ಪ		**4 Hours**
ಕವಿ ಪರಿಚಯ, ಪ್ರೀತಿಯ ವಿವಿಧ ಆಯಾಮಗಳನ್ನು ಪರಿಚಯಿಸುವುದು, ಬದುಕಿನ ಚೈತನ್ಯವಾಗಿ ಪ್ರೀತಿ, ಆಧುನಿಕ ಜಗತ್ತಿನಲ್ಲಿ ಪ್ರೀತಿಯ ಅಸ್ತಿತ್ವವನ್ನು ಪರಿಚಯಿಸುವುದು, ಪ್ರಕೃತಿ ಮತ್ತು ಮನುಷ್ಯನ ನಡುವಿನ ಪ್ರೀತಿಯ ಸಂಬಂಧವನ್ನು ತಿಳಿಸುವುದು		
Module:2: ಬಸವಣ್ಣನವರ ವಚನಗಳು		**6 Hours**
ವಚನ ಸಾಹಿತ್ಯದ ಪರಿಚಯ, ಕನ್ನಡ ಸಾಹಿತ್ಯದಲ್ಲಿ ವಚನಗಳ ಮಹತ್ವ, ಪ್ರಮುಖ ವಚನಕಾರರ ಪರಿಚಯ, ವಚನ ಸಾಹಿತ್ಯ ಪ್ರಮುಖ ಅಂಶಗಳ ಬಗೆಗೆ ತಿಳಿಸುವುದು, ವಚನ ಸಾಹಿತ್ಯದಲ್ಲಿ ಇರುವ ಜೀವನ ಮೌಲ್ಯಗಳ ಬಗೆಗೆ ವಿಶ್ಲೇಷಣೆ, ಬಸವಣ್ಣನವರ ಪರಿಚಯ, ಬಸವಣ್ಣನವರ ಜೀವನದ ಪ್ರಮುಖ ಘಟನೆಗಳ ಬಗೆಗೆ ವಿವರಣೆ, ಬಸವಣ್ಣನವರ ವಚನಗಳ ತಾತ್ವಿಕ ವಿಚಾರದ ಬಗೆಗೆ ಚರ್ಚೆ.		
Module:3: ಧನ್ವಂತರಿ ಚಿಕಿತ್ಸೆ – ಕುವೆಂಪು		**8 Hours**
ಕತೆಯ ಲೇಖಕರ ಪರಿಚಯ, ಪುರಾಣಗಳ ಪರಿಚಯ, ಪುರಾಣ ಪಾತ್ರಗಳ ವಿವರಣೆ, ಕತೆಯ ವಿವರದೊಂದಿಗೆ ರೈತರ ಇಂದಿನ ಸಮಸ್ಯೆಗಳ ವಿಶ್ಲೇಷಣೆ, ಕತೆಯು ಪ್ರಸ್ತುತ ಸ್ಥಿತಿಯನ್ನು ವಿವರಿಸುವಲ್ಲಿ ಯಶಸ್ವಿಯಾಗಿದೆ ಎಂಬುದನ್ನು ತಿಳಿಸುವುದು, ಧನ್ವಂತರಿ ಕತೆಯ ಆಶಯವನ್ನು ವಿವರಿಸುವುದು, ರೈತರ ಸಮಸ್ಯೆಗಳಿಗೆ ಹೊಸ ಬಗೆಯ ಪರಿಹಾರಗಳನ್ನು ಕುರಿತು ಚಿಂತನೆಗೆ ತೊಡಗುವುದು.		

Course Code: CPSAL1081 English: (SOM/SOEC/SOSSH/SOSS/SOD/SOA) Batch-2024
CO1: Define Critical Thinking skills (L1) **CO2:** Compare the poetical terms and integrate creative ideas in the English Language. (L2) **CO3:** Interpret meaningful connectivity on the basis of characters with the plot.(L2) **CO4:** Develop Narrative skills to improve their writing proficiency. (L3) **CO5:** Construct sentences to improve their Verbal Skills.(L3)

Oral and Written Communication (4 group Schools) Course Code: CPSAL2032 Batch:2024
CO1: Apply different listening techniques to effectively engage with diverse speakers and situations. (L3) CO2:Demonstrate proficiency in both oral and written communication, effectively expressing ideas, opinions, and information in a clear and coherent manner. (L3) CO3: Use the different methods and strategies of reading. (L3) CO4: Apply acquired knowledge in writing using appropriate tone and structure. (L3) CO5: Analyze and interpret grammatical structure in texts to enhance communication skills in various contexts, including academic writing, professional correspondence, and interpersonal communication. (L2, L3)

GR Course

GPSDR1091 : Personality Development

CO1:Identify their personal strengths, weaknesses, and interests to develop a practical career plan. [Level 3]

CO2: Develop a well defined career objective aligned with their chosen career trajectory [Level 3]

CO3: Demonstrate their own understanding of 21st century skills critically, to identify their areas of strengths and weaknesses, and work on them consciously [Level-3].

CO4:Compare and contrast different strategies for regulating and managing emotions and evaluate the impact of emotions on personal and professional relationships [Level-4].

Preparing for Aptitude Tests [UG-1/3]
CO1: Determine the calculation techniques for quick calculations and manipulation of numbers. CO2: Apply the concepts of percentages, exponents, ratios, proportions, and averages for computing simple, compound interests and to calculate class /set relationships. CO3: Solve problems of various arrangements (Circular and Linear). CO4: Analyze the different graphs and interpret their specific components by solving problems. CO5: Improve their grasp of English grammar to understand problems relating to verbal ability.