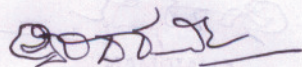| Course Code: CSDSC4T	Course Title: Database Management Systems
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 02 Hours

Course Outcomes (COs):
At the end of the course, students will be able to:

- Explain the various database concepts and the need for database systems.
- Identify and define database objects, enforce integrity constraints on a database using DBMS.
- Demonstrate a Data model and Schemas in RDBMS.
- Identify entities and relationships and draw ER diagram for a given real-world problem.
- Convert an ER diagram to a database schema and deduce it to the desired normal form.
- Formulate queries in Relational Algebra, Structured Query Language (SQL) for database manipulation.
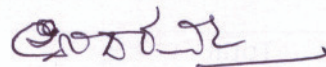- Explain the transaction processing and concurrency control techniques.

Content	Hours
Unit – 1	
Database Architecture: Introduction to Database system applications. Characteristics and Purpose of database approach. People associated with Database system. Data models. Database schema. Database architecture. Data independence. Database languages, interfaces, and classification of DBMS.	10
Unit – 2	
E-R Model: Entity-Relationship modeling: E – R Model Concepts: Entity, Entity types, Entity sets, Attributes, Types of attributes, key attribute, and domain of an attribute. Relationships between the entities. Relationship types, roles and structural constraints, degree and cardinality ratio of a relationship. Weak entity types, E -R diagram.	10
Unit – 3	
Relational Data Model: Relational model concepts. Characteristics of relations. Relational model constraints: Domain constrains, key constraints, primary & foreign key constraints, integrity constraints and null values. Relational Algebra: Basic Relational Algebra operations. Set theoretical operations on relations. JOIN operations Aggregate Functions and Grouping. Nested Sub Queries-Views. Introduction to PL/SQL & programming of above operations in PL/SQL	12

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Unit - 4	
Data Normalization: Anomalies in relational database design. Decomposition. Functional dependencies. Normalization. First normal form, Second normal form, Third normal form. Boyce-Codd normal form.	10
Unit - 5	
Query Processing Transaction Management: Introduction Transaction Processing. Single user & multiuser systems. Transactions: read & write operations. Need of concurrency control: The lost update problem, Dirty read problem. Types of failures. Transaction states. Desirable properties (ACID properties) of Transactions. Concurrency Control Techniques: Locks and Time stamp Ordering. Deadlock & Starvation.	10

References:

1. Fundamentals of Database Systems, Ramez Elamassri, Shankant B. Navathe, 7th Edition, Pearson, 2015
2. An Introduction to Database Systems, Bipin Desai, Galgotia Publications, 2010.
3. Introduction to Database System, C J Date, Pearson, 1999.
4. Database Systems Concepts, Abraham Silberschatz, Henry Korth, S.Sudarshan, 6th Edition, McGraw Hill, 2010.
5. Database Management Systems, Raghu Rama Krishnan and Johannes Gehrke, 3rd Edition, McGraw Hill, 2002.

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Course Code: CSDSC4P	Course Title: DBMS Lab
Course Credits: 02	Hour of Practical/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 02 Hours

CO: Student would be able to create tables, execute queries and PL/SQL programs.
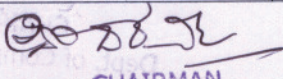
PART-A

1. Execute a single line query
2. Execute group functions.
3. Execute DDL Commands.
4. Execute DML Commands
5. Execute DCL Commands
6. Execute TCL Commands.
7. Implement the Nested Queries.
8. Implement Join operations in SQL
9. Create views for a particular table
10. Implement Locks for a particular table

PART-B

1) Write PL/SQL program to display square and cube of a given number.

2) Write PL/SQL program to find area of rectangle.

3) Write PL/SQL program to find simple interest.

4) Write PL/SQL program to check whether a number is even or odd.

5) Write PL/SQL program to do reverse of given number.

6) Write PL/SQL program to find factorial of a given number.

7) Write PL/SQL procedure to accept EMPNO as input and display EMPLOYEE NAME. Raise an EXCEPTION if EMPNO is not in the EMPLOYEE Table.

8) Write PL/SQL procedure to display the contents of EMPLOYEE table using CURSORS

9) Write PL/SQL procedure to create a FUNCTION to count the number of employees in the EMPLOYEE table

10) Write PL/SQL procedure to demonstrate PACKAGES.

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program – 1 from Part A	Flowchart / Algorithm	03
	Writing the Program	05
Program -2 from Part B	Flowchart/Algorithm	03
	Writing the Program	05
Execute any one program of Examiner choice		06
	Viva Voce	03
Total		25

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Course Code: CSOET4	**Course Title:** Python Programming Concepts
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 02 Hours

Course Outcomes (COs):

- Explain the fundamentals of Computers.
- Explain the basic concepts of Python Programming.
- Demonstrate proficiency in the handling of loops and the creation of functions.
- Identify the methods to create and store strings.
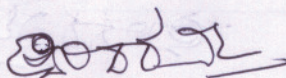
Course Content

Content	Hours
Unit – 1	
Fundamentals of Computers: Introduction to Computers - Computer Definition, Characteristics of Computers, Types of Computers, Basic Organization of a Digital Computer; Number Systems – different types, Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples.	10
Unit – 2	
Python Basics: Introduction to Features and Applications of Python; Python Versions; Installation of Python; Python Command Line mode and Python IDEs; Simple Python Program. Identifiers; Keywords; Statements and Expressions; Variables; Operators; Precedence and Association; Data Types; Indentation; Comments; Built-in Functions-Console Input and Console Output, Type Conversions; Python Libraries; Importing Libraries with Examples; Illustrative programs.	8
Unit - 3	
Python Control Flow: Types of Control Flow; Control Flow Statements- if, else, elif, while loop, break, continue statements, for loop Statement; range() and exit () functions; Illustrative programs.	8
Unit - 4	
Python Functions: Types of Functions; Function Definition- Syntax, Function Calling, Passing Parameters/arguments, the return statement; Default Parameters; Command line Arguments; Key Word Arguments; Illustrative programs.	8

Unit 5	
Strings: Creating and Storing Strings; Accessing Sting Characters; the str() function; Operations on Strings- Concatenation, Comparison, Slicing and Joining, Traversing; Format Specifies; Escape Sequences; Raw and Unicode Strings; Python String Methods; Illustrative programs.	8

References:

1. Computer Fundamentals (BPB), P. K. Sinha & Priti Sinha
2. Think Python How to Think Like a Computer Scientist, Allen Downey et al., 2nd Edition, Green Tea Press. Freely available online 2015.
   @https://www.greenteapress.com/thinkpython/thinkCSpy.pdf
3. Introduction to Python Programming, Gowrishankar S et al., CRC Press, 2019.
4. http://www.ibiblio.org/g2swap/byteofpython/read/
5. http://scipy-lectures.org/intro/language/python_language.html
6. https://docs.python.org/3/tutorial/index.html

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SEC-2 Paper ARTIFICIAL INTELLIGENCE

Syllabus for B.A, B.Sc., B.Com, BBM, BBA, BCA, B.Sc (Computer Science), BSW, BFA, BVA, and all other Degree Programmes offered by Gulbarga University, Kalaburagi from time to time.

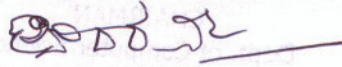|	
Course Code: SEC2	Course Title : Artificial Intelligence
Course Credits: 02	Hours/Week: 01 Hr Theory & 02 Hrs Practical
Total Contact Hours:13T+26P	Formative Assessment Marks: 20
Exam Marks: 30	Exam Duration: 02 Hours

Course Outcomes (COs):

At the end of the course, students will be able to:

- Appraise the theory of Artificial intelligence and list the significance of AI.
- Discuss the various components that are involved in solving an AI problem.
- Illustrate the working of AI Algorithms in the given contrast.
- Analyze the various knowledge representation schemes, Reasoning and Learning techniques of AI.
- Apply the AI concepts to build an expert system to solve the real-world problems.

Content	Hours
Unit - 1	
Overview of AI: Definition of Artificial Intelligence, Philosophy of AI, Goals of AI, Elements of AI system, Programming a computer without and with AI, AI Techniques, History of AI. **Intelligent Systems:** Definition and understanding of Intelligence, Types of Intelligence, Human Intelligence vs Machine Intelligence.	05
Unit – 2	
AI Applications: Virtual assistance, Travel and Navigation, Education and Healthcare, Optical character recognition, E-commerce and mobile payment systems, Image based search and photo editing. **AI Examples in daily life:** Installation of AI apps and instructions to use AI apps.	05
Unit – 3	
Robotics: Introduction to Robotics, Difference in Robot System and Other AI Program, Components of a Robot.	03

Note: Artificial Intelligence Paper must be taught by Computer Science Faculty only.

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Laboratory Activities:

- **Amazon Alexa:**
  https://play.google.com/store/apps/details?id=com.amazon.dee.app&hl=en&gl=US
- **Google Lens:**
  https://play.google.com/store/search?q=google+lens&c=apps&hl=en&gl=US
- **Image to Text to Speech ML OCR:**
  https://play.google.com/store/apps/details?id=com.mlscanner.image.text.speech&hl=en_IN&gl=US
- **Google Pay:**
  https://play.google.com/store/apps/details?id=com.google.android.apps.nbu.paisa.user&hl=en_IN&gl=US
- **Grammarly:**
  https://play.google.com/store/search?q=grammarly&c=apps&hl=en_IN&gl=
- **Google Map:**
  https://play.google.com/store/search?q=google+maps&c=apps&hl=en&gl=US
- **FaceApp:**
  https://play.google.com/store/apps/details?id=io.faceapp&hl=en_IN&gl=US
- **Socratic:**
  https://play.google.com/store/apps/details?id=com.google.socratic&hl=en_IN&gl=US
- **Google Fit: Activity Tracking:**
  https://play.google.com/store/apps/details?id=com.google.android.apps.fitness&hl=en_IN&gl=US
- **SwiftKey Keyboard:**
  https://swiftkey-keyboard.en.uptodown.com/android
- **E-commerce App:**
  https://play.google.com/store/apps/details?id=com.jpl.jiomart&hl=en_IN&gl=US

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Text Books:

1. Wolfgang Ertel, "Introduction to Artificial Intelligence", 2nd Edition, Springer International Publishing 2017.
2. Michael Negnevitsky, "Artificial Intelligence A Guide to Intelligent Systems", 2nd Edition, Pearson Education Limited 2005.
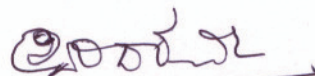
References:

1. https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_tutorial.pdf
2. Kevin Knight, Elaine Rich, Shivashankar B. Nair,"Artificial Intelligence", 3rd Edition, July 2017.

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Reference Links:

1. Voice Assistant: https://alan.app/blog/voiceassistant-2/
2. Browse with image:
   https://www.pocket-lint.com/apps/news/google/141075-what-is-google-lens-and-how-does-it-work-and-which-devices-have-it
3. OCR: https://aws.amazon.com/what-is/ocr/
4. Mobile Payment system:
   https://gocardless.com/en-us/guides/posts/how-do-mobile-payment-systems-work/
5. Grammarly:
   https://techjury.net/blog/how-to-use-grammarly/#gref
6. Travel & Navigation:
   https://blog.google/products/maps/google-maps-101-ai-power-new-features-io-2021/
7. AI in photo editing:
   https://digital-photography-school.com/artificial-intelligence-changed-photo-editing/
8. AI in education:
   https://www.makeuseof.com/what-is-google-socratic-how-does-it-work/
9. AI in health and fitness:
   https://cubettech.com/resources/blog/implementing-machine-learning-and-ai-in-health-and-fitness/
10. E-commerce and online shopping:
    https://medium.com/@nyxonedigital/importance-of-e-commerce-and-online-shopping-and-why-to-sell-online-5a3fd8e6f416

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