

Minor syllabus - Effective from 2020-21
Computer Science

Year: First

Semester: Second

Name of Paper: Computer Science (Minor)

Course Title: CSMinor101: Computer Fundamental and Problem Solving

Course outcomes:

- C01: Understand hardware components of computer system such as memory system organization, input/output devices, aware of software components of computer system, and windows operating system concepts.
C02: Develops basic understanding of computers, the concept of algorithm and algorithmic thinking.
C03: Develops the ability to analyze a problem, develop an algorithm to solve it.
C04: DevelopstheuseofthePythonprogramminglanguage to implement various algorithms, and develops the basic concepts and terminology of programming in general.
C05: Introduces the more advanced features of the Python language
C06: To learn and understand python looping, control statements

Credits: 06		Minor	
Max.Marks: 100 (75+25)		Min Passing Marks: 33	
Total No. of Lectures- 60 (10 Lectures/unit)			
Unit	Topic		
I	Computer Fundamentals: Introduction to Computers: Characteristics of Computers, Uses of computers, Types and generations of Computers.		
II	Basic Computer Organization - Units of a computer, CPU, ALU, memory hierarchy, registers, I/O devices. Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.		
III	Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.		
IV	Overview of Programming: Structure of a Python Program, Elements of Python, IDEs for Python, Python Interpreter, Using Python as calculate or, Python shell, Indentation.		
V	Introduction to Python: Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator).		
VI	Creating Python Programs: Input and Output Statements, Control statements (Looping: While Loop, for Loop, Loop Control, Conditional Statement-if...else, Difference between break, continue and pass).		

Suggested Readings:

1. SOMASHEKARA, M. T., GURU, D. S., MANJUNATHA, K. S. Problem solving with "C" 2018
2. Ashok Arora Computer Fundamentals & applications. 2015
3. Dr. Anita Goel, Computer Fundamentals, Pearson Education, 2010.
4. T. Budd, Exploring Python, TMH, 1st Ed, 2011
5. Python Tutorial/ Documentation www.python.org 2010
6. Allen Downey, Jeffrey Elkner, Chris Meyers, How to think like a computer scientist: learning with Python, Freely available online. 2012
7. Rober Sedgewick, K Wayne- Introduction to Programming in Python: An interdisciplinary Approach, Pearson India

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Muthalavally Mahavidyalaya, Muzhappilly

Suggestive digital platforms web links-

- <https://www.pearsoned.co.in/prc/book/anita-goel-computer-fundamentals-1e-1/9788131733097>
- <http://docs.python.org/3/tutorial/index.html>
- <http://interactivepython.org/courselib/static/pythonds>
- <http://www.ibiblio.org/g2swap/byteofpython/read/>


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Maa Vinayakam University, Mysore

Year: Second

Semester: Four

Name of Paper: Computer Science (Minor)

Course Title: CSMInor201: Database Management Systems

Course outcomes:

CO1: Understands the basic concepts of database management systems.

CO2: Design E-R diagrams for real world applications.

CO3: Formulate relational algebraic expressions using relational data models and languages.

CO4: Apply normalization transaction properties and concurrency control to design database.

CO5: Understand the basic concepts Transaction control, Query Processing of data base management systems.

CO6: Analyze the Concurrency Control Techniques.

CO7: Understand the basic concepts Structure Query Language.

Credits:6		Minor
Max.Marks:100 (75+25)		Min. Passing Marks: 33
Total No. of Lectures- 60 (10 Lectures/unit)		
Unit	Topic	
I	Introduction: Database System Concepts, File system vs. database system, Database system architecture, Data models and their types, Database scheme and instances, Data independence, Database Languages and Interfaces.	
II	Data Modeling Concepts: ER model concepts: Notations for ER diagram, Extended E-R diagram, Extended E-R model, E-R model design issues, constraints, and keys: Weak entity set strong entity set, Relationships of higher degree.	
III	Relational model concepts: code rules, constraints, Relational Algebra operations, Extended relational algebra operations, Relational Calculus, Tuple and Domain relational calculus.	
IV	Database Design: Functional dependencies, Normal forms, First, second, and third normal forms, BCNF, Multi-valued dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal form.	
V	Transaction, Query Processing: Transaction and system concepts: transaction states, ACID properties of transactions, concurrent execution schedules and Recoverability, Serializability of schedules. Query Processing and Optimization: Measures of Query cost, Cost, Evaluation of expression. Optimization: Transformation of relational expression, Choice of evaluation plan.	
VI	Concurrency Control: Concurrency Control Techniques: Two phase Locking Techniques for Concurrency Control; Time stamping in Concurrency control.	
VII	Introduction to SQL: Basic Structure of SQL Query, Set operators, SELECT, UNION, INTERSECT, and EXCEPT, Nested queries, Aggregate function, Null values, Derived Relations, Modification of the Database, Joined relations and up-dates in SQL.	

Suggested Readings:

1. Elmasri, navathe, "Fundamentals of Database System", 2021
2. Atul Kahate, "Introduction to Data base management systems", Pearson India, 2014.
3. Raghu Rama Krishnan and Johannes Gehrike, "Data base management systems", Third McGraw Hill, Edition, 2003.
4. R. Elmasri, S.B. Navathe "Database Systems Models, Languages, Design and application Programming", 6 Edition, Pearson Education, 2013.
5. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, Tata McGraw Hill, 2010.
6. C.J Date "AnIntroduction to Database Systems", Addison Wesley


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