

KAMARAJ COLLEGE OF ENGINEERING AND TECHNOLOGY**B.E. / B.TECH. DEGREE PROGRAMMES****FIRST YEAR COURSES****(Regulations 2021 – Autonomous)****SEMESTER I**

Sl.No	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	SH2101	Technical English	3	0	0	3
2	MA2101	Matrices and Differential Calculus	3	1	0	4
3	PH2101	Engineering Physics	3	0	0	3
4	GE2101	Principles of Engineering	3	0	0	3
5	EM2101	Coding Techniques - I	3	0	0	3
6	CY2101	Engineering Chemistry	3	0	0	3
Practical						
7	MA2102	Mathematics Laboratory	0	0	2	1
8	PH2102	Physics Laboratory	0	0	3	1
9	EM2102	Coding Techniques - I Laboratory	0	0	3	1
Total Credits			18	1	8	22

Course Code	Course Name	L	T	P	C
EM2101	Coding Techniques – I	3	0	0	3

Category: Employability Enhancement Courses (Programming Courses)

a. Preamble

This course enables the students to understand the importance of coding to solve the real-time challenges by computer. Coding emphasizes the need to enrich the logical skills of the students to instruct the computer for solving the problems. This course focuses on problem solving using structured programming language.

b. Course Outcomes

After successful completion of the course, the students will be able to

CO.No.	Course Outcome	Knowledge Level
CO1	Understand the importance of programming, Analyze any given problem and Develop algorithm to solve it	K3
CO2	Understanding to applying basic concepts of C Programming	K4
CO3	Insightful analysis of arrays and pointers	K3
CO4	Understanding to applying collective data types and file handling	K4
CO5	Developing simple applications using advanced concepts	K6

c. Course Syllabus

Total: 45 Periods

PROBLEM SOLVING FUNDAMENTALS 9

Programs and Algorithms – Problem Definition – Flow Chart – Fundamental Algorithms (Exchange of values of two variables, Counting, Summation of a set of numbers, Factorial Computation, Sine Function Computation, Generation of Fibonacci Sequence, Reversing the Digits of an Integer, Base Conversion): Problem – Algorithm Development – Algorithm Description – Design Consideration – Applications.

C PROGRAMMING FUNDAMENTALS 9

Types and Values – Pre-processors – Declaration and Prototypes - Constants and Variables – Pre-defined Libraries - Storage Classes – Expressions – Operator Precedence and Associativity - Input and Output Statements – Decision Making and Looping Constructs – Type Casting – Concept of Functions – Parameter Passing mechanism.

ARRAYS AND POINTERS 9

Representation of Single and Multidimensional Arrays – Concept of Pointers – Pointer Arithmetic – Strings – Call by Reference – Dynamic Memory Allocation – Function Pointers.

COLLECTIVE DATA TYPES AND FILE HANDLING 9

Structure and Union – Enumeration – Type Defining Structures – Structures and Pointers - Self Referential Structure - Sequential and Random Access File Handling – Opening and Closing of a File - Input and Output Operations on a File – Handling of Binary files.

Bit Fields – Type def – Macro Functions - User Defined Libraries – Variable Arguments – Command Line Arguments – Recursive Functions – Modular Programming – Package Development.

d. Activities: Students shall be exposed to UNIX C or TURBO C Programming to solve simple problems and able to develop simple C Applications.

e. Learning Resources

i. TEXT BOOKS

1. Dromey R.G, “How to Solve it by Computer”, Prentice Hall, 1982.
2. Brian W. Kernighan and Dennis M. Ritchie, “The C Programming Language” Second Edition, Pearson Education, 2015.

ii. REFERENCE BOOKS

1. Paul Deitel and Harvey Deitel, “C How to Program”, Eighth Edition, Pearson Education, 2016.
2. Byron S. Gottfried, “Theory and Problems of Programming with C”, Schaum’s Outlines, Second Edition, McGraw-Hill, 1996.
3. Yashavant Kanetkar, “Let Us C”, Sixteenth Edition, BPB Publications, 2018.
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein., “Introduction to Algorithms”, Third Edition, The MIT Press, 2009.

Course Code	Course Name	L	T	P	C
EM2102	Coding Techniques - I Laboratory	0	0	3	1

Category: Employability Enhancement Courses (Programming Courses)

a. Preamble

This course enables the students to develop simple applications in C using basic constructs, arrays, strings, pointers, functions, files, structures and packages

b. Course Outcomes

After successful completion of the course, the students will be able to

CO.No.	Course Outcome	Knowledge Level
CO1	Construct simple C programs using basic expressions and control structures	K3
CO2	Implement the concepts of functions in C	K3
CO3	Insightful analysis of arrays and pointers	K3
CO4	Build C programs to solve simple applications using structures and files	K3
CO5	Developing simple applications using packages	K3

c. Course Syllabus

Total: 45 Periods

1. Simple programs - to be familiar with syntax and structure of C programming
2. Programs using library functions and user-defined functions
3. Programs on conditional constructs (if, if-else-if ladder, switch)
4. Programs on looping constructs (while, do-while, for)
5. Programs using pointers with single and multidimensional arrays
 - i. Searching and Sorting
 - ii. Matrices manipulations
 - iii. String manipulations (palindrome, anagram, etc.,)
6. Programs using function definition , types of function calls and recursion
7. Programs on structures and union, passing entire structure to functions
8. Programs on files
 - i. Creating a text file to store records of N persons, retrieve and display the nth record from a file
 - ii. Copy the content of one file to another file using command line arguments
9. Simple applications using packages

d. Learning Resources

REFERENCE BOOKS

1. Yashavant Kanetkar, “Let Us C”, Sixteenth Edition, BPB Publications, 2018.
2. Brian W. Kernighan and Dennis M. Ritchie, “The C Programming Language” Second Edition, Pearson Education, 2015.
3. Paul Deitel and Harvey Deitel, “C How to Program”, Eighth Edition, Pearson Education, 2016.



(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

S.P.G.Chidambara Nadar - C.Nagammal Campus

S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

B.E. / B.TECH. DEGREE PROGRAMMES

FIRST YEAR COURSES

(Regulations 2021)

SEMESTER II

Sl.No	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1	SH2151	Professional English	3	0	0	3
2	MA2151	Vector Calculus, Complex Integration and Laplace Transforms	3	1	0	4
3	PH2151	Physics of Non-Conventional Energy Sources	3	0	0	3
4	GE2151	Engineering Graphics	2	0	3	3
5	GE2152	Environmental Science and Engineering	3	0	0	3
6	EM2151	Coding Techniques - II	3	0	0	3
Practical						
7	CY2151	Chemistry Laboratory	0	0	3	1
8	EM2152	Coding Techniques – II Laboratory	0	0	3	1
9	GE2153	Engineering Practices Laboratory	0	0	4	2
Total Credits			17	1	13	23

Course Code	Course Name	L	T	P	C
EM2151	Coding Techniques – II	3	0	0	3

Category: Employability Enhancement Courses (Programming Courses)

a. Preamble

This course enables the students to understand the importance of coding using python to solve the real-time challenges by computer. This course enriches the logical skills of the students to instruct the computer for solving the problems. This course focuses on problem solving using Python programming language.

b. Course Outcomes

After successful completion of the course, the students will be able to

CO.No.	Course Outcome	Knowledge Level
CO1	Develop simple computational problems	K3
CO2	Solve simple real world problems using looping statements and functions	K3
CO3	Make use of string, list and tuple to represent compound data	K3
CO4	Develop simple programs using built-in and user defined packages	K3
CO5	Illustrate the use of exception handling and file handling in Python Programming	K2

c. Course Syllabus

Total: 45 Periods

INTRODUCTION TO PYTHON AND DECISION MAKING CONSTRUCTS 9

Introduction to Python Programming - Python Interpreter and Interactive Mode - Variables and Identifiers - Arithmetic Operators - Values and Types - Statements - Operators - Boolean Values - Operator Precedence - Expression - Conditionals: If - else Constructs.

LOOPING AND FUNCTIONS 9

Loop Structures/Iterative Statements – While Loop – For Loop – Break Statement – Continue Statement – Functions: Function Call and Returning Values – Parameter Passing - Local and Global Scope – Recursive Functions.

STRING, LIST AND TUPLE 9

Strings: Introduction, Indexing, Traversing, Concatenating, Appending, Multiplying, Formatting, Slicing, Comparing, Iterating - Basic Built-in String Functions - Introduction to Data Structures - List - Adding Items to a List - Finding and Updating an Item - Nested Lists - Cloning Lists - Looping Through a List – Sorting a List - List Concatenation - List Slices - List Methods - List Loop - Mutability - Aliasing - Tuples: Creation, Accessing, Updating, Deleting Elements in a Tuple, Tuple Assignment, Tuple as Return Value, Nested Tuples, Basic Tuple Operations – Sets.

DICTIONARIES MODULES AND PACKAGES 9

Dictionary: Creating, Accessing, Adding Items, Modifying, Deleting, Sorting, Looping, Nested Dictionaries Built-in Dictionary Function - Finding Key and Value in a Dictionary - Modules - Module Loading and Execution - Packages - Standard Libraries (Time, Math, Numpy, Pandas, PyGame) - User-defined Packages.

FILE HANDLING AND EXCEPTION HANDLING 9

Introduction to Files - File Path - Opening and Closing Files - Reading and Writing Files - File Position - Exception: Errors and Exceptions, Exception Handling, Multiple Exceptions.

d. Activities: Students shall be exposed to basic Python programming concepts and to solve simple problems using python.

e. Learning Resources

i. TEXT BOOKS

1. Allen B. Downey, "*Think Python: How to Think Like a Computer Scientist*", 2nd edition, Shroff/O'Reilly Publishers.
2. Guido van Rossum & Fred L. Drake Jr., 2011, "*An Introduction to Python – Revised and Updated for Python 3.2*", Network Theory Ltd.

ii. REFERENCE BOOKS

1. John V Guttag 2013, "*Introduction to Computation and Programming Using Python*", Revised and Expanded Edition, MIT Press.
2. Charles Dierbach 2016, "*Introduction to Computer Science using Python*", Wiley India Edition.
3. Timothy A. Budd 2015, "*Exploring Python*", Mc-Graw Hill Education (India) Private Ltd.
4. Kenneth A. Lambert 2012, "*Fundamentals of Python: First Programs*", Cengage Learning.
5. Reema Thareja 2017, "*Python Programming: Using Problem Solving Approach*", Oxford University Press.

Course Code	Course Name	L	T	P	C
EM2152	Coding Techniques - II Laboratory	0	0	3	1

Category: Employability Enhancement Courses (Programming Courses)

a. Preamble

This course enables the students to develop simple applications in Python using basic constructs, I/O statements and expressions, decision making and looping statements, functions, usage of packages, file and exception handling

b. Course Outcomes

After successful completion of the course, the students will be able to

CO.No.	Course Outcome	Knowledge Level
CO1	Implement Python codes to solve simple problems using Statements, Expressions and conditional statements	K3
CO2	Develop simple applications using functions for effective code reuse and debugging	K3
CO3	Build solutions for simple problems using Strings, lists, tuples and dictionaries in Python	K3
CO4	Use packages in Python for solving simple applications	K3
CO5	Develop simple real world applications involving file operations and Exception handling mechanisms using Python Programming	K3

c. Course Syllabus

Total: 45 Periods

1. PYTHON PROGRAMS USING I/O STATEMENTS AND EXPRESSIONS

TO:

- a. Find simple interest and compound interest
- b. Find gross salary of a person, given basic pay, DA%, TA% and PF%
- c. Find the area of shapes (triangle, circle)
- d. Swap two numbers
- e. Display the student information (collect the information from the end user)

2. PYTHON PROGRAMS USING DECISION-MAKING AND LOOPING CONSTRUCTS TO:

- a. Find GCD of two given numbers
- b. Find LCM of two given numbers
- c. Generate 'n' prime numbers
- d. Exponentiation (power of two given numbers)
- e. Check if a given number is Happy number or not
- f. Solve quadratic equation

3. PYTHON PROGRAMS USING FUNCTIONS TO:

- a. Convert the given decimal number into binary, octal and hexadecimal numbers using user defined functions
- b. To print all pronic numbers between a range
- c. Display Fibonacci series using recursion
- d. Find the sum of digits of a given number using recursion

4. PYTHON PROGRAMS USING STRINGS TO:

- a. Find the ASCII value of a character
- b. Check if a string contains any special character
- c. Sort strings in alphabetical order
- d. Find all close matches of input string from a list

5. PYTHON PROGRAMS USING LIST AND TUPLE TO :

- a. Display the duplicate elements
- b. Right rotate the elements
- c. Matrix Multiplication
- d. Create a list of tuples from given list having number and its cube in each tuple

6. PYTHON PROGRAMS USING DICTIONARY TO:

- a. Sort list of dictionaries by values in Python – Using lambda function
- b. Merging two Dictionaries
- c. Scraping And Finding Ordered Words In A Dictionary using Python

7. PYTHON PROGRAMS USING NUMPY, PANDAS AND PYGAME TO:

- a. Sort an array using Numpy
- b. Using Pandas, create a Student dataframe and display first and last 'n' rows
- c. Draw basic shapes (Circle, Rectangle)

8. PYTHON PROGRAMS USING FILES AND EXCEPTION HANDLING MECHANISMS TO:

- a. Take command line arguments and count number of words in it
- b. Find the most frequent words in a text read from a file
- c. Read the necessary information from text file to generate an electricity bill and catch the corresponding exceptions

d. Learning Resources

REFERENCE BOOKS

1. Allen B. Downey, "*Think Python: How to Think Like a Computer Scientist*", 2nd edition, Shroff/O'Reilly Publishers.
2. Guido van Rossum & Fred L. Drake Jr., 2011, "*An Introduction to Python – Revised and Updated for Python 3.2*", Network Theory Ltd.