

PYTHON PROGRAMMING

FIRST EDITION

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PREFACE

This book is designed for use in courses on Python Programming at the undergraduate/postgraduate level, particularly designed for the structured curriculum of Bachelor of Technology and Bachelor of Engineering – Computer science & Engineering

Although the contents of the book follows the essential content of complete concepts of python programming is sufficiently broad in scope and rigorous in coverage to satisfy any undergraduate and postgraduate requirements in the field of IT/CSE.

The book is organized into five sections:

Section 1, describes about the basics of python programming which covers the variables, identifiers, arithmetic operator, values & type, python statement, operator, operator precedence, expressions & statements, functions etc.,

Section 2, covers the data types in python, list, characteristics, string, python dictionary, modules, scope of variables, packages, libraries etc.,

Section 3, delivers the file handling & exception handling, data files in python, file operation, file methods & python exception handling etc.,

Section 4, covers about the python modules, listing of modules, variables in a modules, modules loading & execution, frameworks in python etc.,

Section 5, includes the object oriented programming in python, oop concept, class, inheritance, polymorphism, encapsulation, overriding methods, constructor and abstraction in python etc.,

The analyses and discussion, covering these five sections in the various chapters of this book, are based on the readings recommended for this course. However, wherever required, we have supplemented from other sources reference. A select bibliography is given at the end of the book for reference to the authors cited in the text

I hope this thoroughly book on Python Programming will prove handy and useful to students and teachers on the same.


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SYLLABUS

PYTHON PROGRAMMING

COURSE OBJECTIVES

- To develop Python programs with conditionals, loops and functions.
- To use Python data structures – lists, tuples, dictionaries.
- To do input/output with files in Python
- To use modules, packages and frameworks in python
- To define a class with attributes and methods in python

CHAPTER 1

BASICS OF PYTHON

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

CHAPTER 2

DATA TYPES IN PYTHON

Lists, Tuples, Sets, Strings, Dictionary, Modules: Module Loading and Execution – Packages – Making Your Own Module – The Python Standard Libraries.

CHAPTER 3

FILE HANDLING AND EXCEPTION HANDLING

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

CHAPTER 4

MODULES, PACKAGES AND FRAMEWORKS

Modules: Introduction – Module Loading and Execution – Packages – Making Your Own Module – The Python Libraries for data processing, data mining and visualization- NUMPY, Pandas, Matplotlib, Plotly-Frameworks- -Django, Flask, Web2Py

CHAPTER 5

OBJECT ORIENTED PROGRAMMING IN PYTHON

Creating a Class, Class methods, Class Inheritance, Encapsulation, Polymorphism, class method

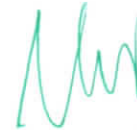

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SPECIAL ELECTRICAL MACHINES

FIRST EDITION

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SYLLABUS

1. MANUFACTURING OF PLASTIC COMPONENTS

Plastic Components: Types of plastics - Engineering plastics – thermosets – composite - structural foam, elastomers - polymer alloys and liquid crystal polymers. Factors Influencing the Selection of Plastics - Mechanical properties – degradation - wear resistance - frictional properties - special properties –processing – cost. Processing of Plastics: Extrusion-general features of single screw extrusion -twin screw extruders. Injection moulding types: Plunger type - Reciprocating screw injection - details of injection mould - structural foam injection mould - sandwich moulding - gas injection moulding - injection moulding of thermosetting materials - calendaring and rotational moulding. Design consideration for plastic components. Composite manufacturing: Introduction – characteristics of composite manufacturing - constituents – Glass fibers manufacturing process – hand laminating process – autoclave processing – filament winding – pultrusion process – liquid composite process – working principles by schematic diagram only – advantages – disadvantages.

2. RECIPROCATING MACHINES

Planer: Introduction - description of double housing planer – specifications -principles of operation – drives - quick return mechanism - feed mechanism - work holding devices and special fixtures - types of tools - operations. Shaper: Introduction – specifications – principles of operations standard shaper – quick return mechanism - crank and slotted link – hydraulic shaper - feed mechanism - work holding devices – fixture - operations. Slotter: Introduction – specifications - method of operation - Whitworth quick return mechanism - feed mechanism - work holding devices - types of tools. Broaching: Types of broaching machine - horizontal, vertical and continuous broaching - principles of operation - types of broaches – classification - broach tool nomenclature - broaching operations.

3. MILLING MACHINES AND GEAR GENERATING PROCESSES

Milling Machines: Types - column and knee type – plain - universal milling machine - vertical milling machine - principles of operation - specification of milling machines - work holding devices - tool holding devices - arbor - stub arbor - spring collet – adapter. Milling cutters: cylindrical milling cutter - slitting cutter -side milling cutter - angle milling cutter - T-



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slot milling cutter - woodruff milling cutter - fly cutter - nomenclature of cylindrical milling cutter.

Milling operations: straddle milling - gang milling - vertical milling attachment. Indexing plate – differential indexing - simple indexing – compound indexing – simple problems. Generating Process: gear shaper - gear hobbing - principle of operation only. Gear finishing processes: burnishing – shaving - grinding and lapping - gear materials.

4. ABRASIVE PROCESS AND NON- CONVENTIONAL MACHINING PROCESSES

Abrasive Process: Types and classification – specifications - rough grinding – pedestal grinders - portable grinders - belt grinders - precision grinding - cylindrical grinder - centerless grinders – surface grinder - tool and cutter grinder - planetary grinders - principles of operations - grinding wheels – abrasives - natural and artificial diamond wheels - types of bonds - grit, grade and structure of wheels - wheel shapes and sizes - standard marking systems of grinding wheels - selection of grinding wheel - mounting of grinding wheels - Dressing and Truing of wheels - Balancing of grinding wheels.

Non-Conventional Machining Processes: Construction, working and applications of Ultrasonic machining - chemical machining - electro chemical grinding - electrical discharge machining - plasma arc machining - LASER machining - Advantages – Disadvantages.

5. CNC MACHINE AND ITS COMPONENTS

CNC Machines: Numerical control – definition – working principle of a CNC system – Features of CNC machines - advantage of CNC machines – difference between NC and CNC – Construction and working principle of turning centre – Construction and working principle of machining centre – machine axes conventions turning centre and machining centre – Coordinate measuring machine – construction and working principle. Components of CNC machine: Slide ways – requirement – types – friction slide ways and antifriction slide ways - linear motion bearings – recirculation ball screw – ATC – tool magazine – feedback devices – linear and rotary transducers – Encoders - in process probing - tool material – tool inserts.



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