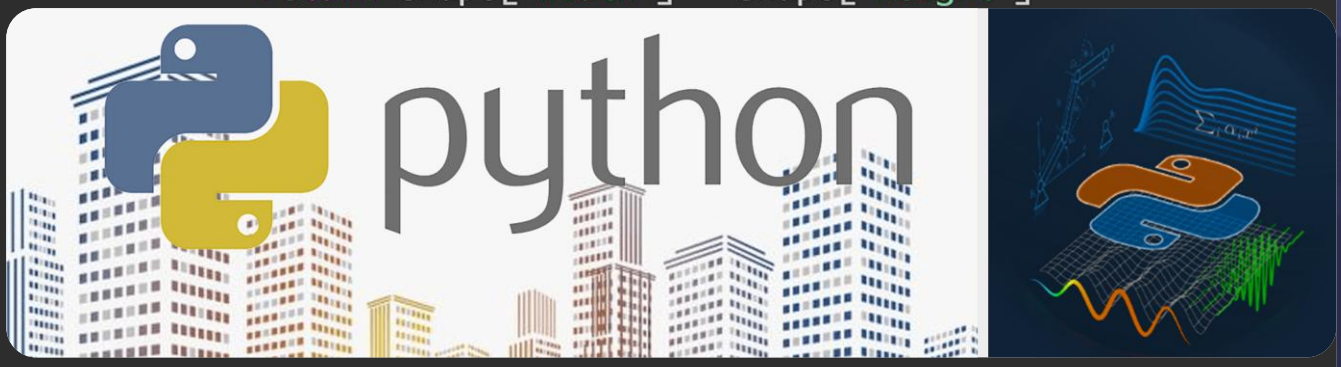
SCMCES TRAINING SERIES

Python

for Civil and Structural Engineers

```
def calculate_area_of_shapes(shapes):
  def area_calculator(shape):
      if shape['type'] == 'rectangle':
          return shape['width'] * shape['height']
```



SCMCES provides consultancy services for civil infrastructure, including Structural Analysis Design, Review, Audit, Remedial Engineering, Advanced Rehabilitation Technologies(ART), Structural Health Monitoring (SHM) services as well as research and training in related engineering domains.

CONSULTANCY & ENGINEERING SERVICES

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"Engineering Insight ✣ Monitoring Integrity ✣ Building Futures"

SCMCES TRAINING SERIES

Python for Civil & Structural Engineers

From Engineering Problems to Programmable Solutions

About the Course

This course is designed for civil and structural engineers who wish to **extend their engineering capability beyond spreadsheets and commercial software** by using Python for **engineering computation, data analysis, automation, and verification**.

Python is widely adopted in engineering for **numerical analysis, scripting, simulation, data processing, optimization, and integration with analysis software**. In professional practice, Python empowers engineers to **develop transparent, repeatable, and customizable solutions**, reducing dependence on black-box tools.

No prior programming experience is required. A basic understanding of **engineering mathematics, structural analysis, and problem-solving logic** is assumed. This course is suitable for **freshers, practicing engineers, analysts, and professionals involved in design, monitoring, research, and automation**.

Who Should Attend

Civil Engineers | Structural Engineers | Post-graduate students | Final-year engineering students | Fresh Graduates | Practicing Professionals

SCMCES Training benefits

- ✓ Engineering-led training approach
- ✓ Practical civil & structural case studies
- ✓ Application-oriented learning
- ✓ Professional certification on completion

How the Training Works

- Step-by-step explanation of Python concepts for engineers
- Live coding demonstrations with civil & structural examples
- Hands-on problem-solving sessions
- Engineering-focused exercises (not generic programming tasks)
- Emphasis on **accuracy, validation, and engineering judgment**

Training batch details

- **Batch starts** : Every Quarterly
- **Training Mode** : Online/ Offline / Hybrid
- **Course duration** : 40 Hrs. (2~3 -hour session per day)
- **Enquire Now | Book Your Seat** : +91 8431 42 28 82
  scmces.consultants@gmail.com

Disclaimer: Python is an open-source programming language. This training is independent and application-oriented.

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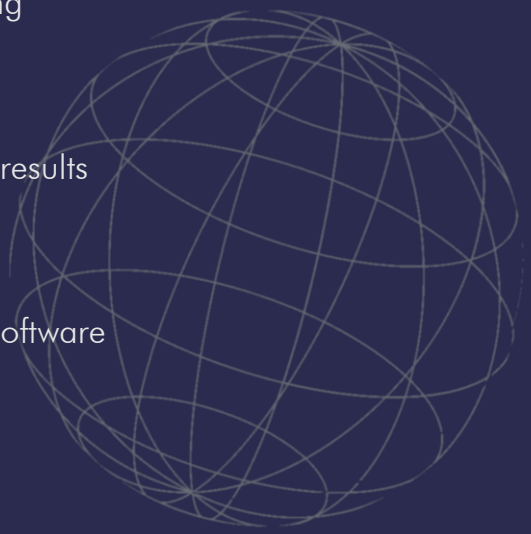
Python for Civil & Structural Engineers

From Engineering Problems to Programmable Solutions

Course Topics & Modules

- **Introduction to Python for Engineers**
  Why Python matters in civil & structural engineering
- **Python Basics & Programming Logic**
  Variables, data types, loops, conditionals
- **Numerical Computing with Python**
  Arrays, matrices, and mathematical operations
- **Engineering Mathematics & Numerical Methods**
  Solvers, integration, differentiation, root finding
- **Structural Analysis Applications**
  Matrix methods, truss and frame examples
- **Data Processing & Visualization**
  Handling test data, monitoring data, plotting results
- **Automation & Parametric Studies**
  Repetitive calculations, scenario analysis
- **Engineering Validation & Verification**
  Cross-checking results from design and FEA software
- **Engineering Reporting & Communication**
  Presenting results clearly to stakeholders
- **Best Practices & Workflow Integration**
  Clean coding, documentation, and reuse



What Participants Receive

- Python scripts for civil & structural problems
- Numerical method reference notes
- Data analysis and plotting templates
- Engineering-oriented coding examples
- Course completion certificate from SCMCES

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