



# GOVERNMENT COLLEGE KASARAGOD

VIDYANAGAR, KASARAGOD, KERALA, 671123

[www.gck.ac.in](http://www.gck.ac.in)



NAAC 3RD CYCLE ACCREDITATION

**ADD ON COURSE IN  
COMPUTATIONAL PHYSICS  
AND PYTHON**



# GOVERNMENT COLLEGE KASARAGOD

VIDYANAGAR, KASARAGOD, KERALA 671123

04994 256027

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Applications invited

## ADD ON COURSE IN COMPUTATIONAL PHYSICS AND PYTHON

OFFERED BY  
DEPARTMENT OF PHYSICS  
GOVERNMENT COLLEGE KASARAGOD

ADMISSION LIMITED TO FINAL YEAR UG  
STUDENTS OF THE DEPARTMENT

Classes starts on  
23-06-2018  
Saturday

Duration : 30 Hours

Enquiries

**Dr.Jijo P.U.**

Associate Professor

Department of Physics

Contact: 9495122006

Name and Signature of the Principal

**Dr. Ananthapadmanabha A.I.**



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KASARAGOD



## SYLLABUS

### **Course Description:**

This intensive 30-hour course is designed to introduce physics graduate students to Python programming. Python is a versatile and widely-used programming language in scientific research, and it provides a powerful toolset for data analysis, simulation, and automation. Through a combination of lectures, hands-on coding exercises, and practical applications in physics, this course aims to equip students with the programming skills necessary to enhance their research capabilities.

### **Prerequisites:**

Basic understanding of physics concepts relevant to your research area.

No prior programming experience is required.

### **Course Objectives:**

By the end of this course, students will be able to:

Understand the fundamentals of Python programming, including syntax, data types, and control structures.

Write Python programs to perform data manipulation, analysis, and visualization.

Utilize Python libraries commonly used in physics research, such as NumPy, SciPy, and Matplotlib.

Apply Python for solving physics problems, including simulations and numerical analysis.

Develop skills for data input and output, including reading and writing files.

### **Course Outline:**

#### **Week 1: Introduction to Python (3 hours)**

Introduction to programming and Python

Setting up a Python development environment (e.g., Anaconda)

Python syntax, variables, and data types

#### **Week 2: Data Manipulation and Analysis (6 hours)**

Data arrays and basic operations with NumPy

Pandas for data manipulation

Data visualization with Matplotlib

#### **Week 3: Scientific Computing (6 hours)**

Introduction to SciPy for scientific computing

Solving equations and optimization



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**Week 4: Physics Simulations (6 hours)**

Introduction to numerical simulations in physics  
Solving differential equations using Python (e.g., ODEs and PDEs)  
Monte Carlo simulations

**Week 5: File Handling and Data I/O (3 hours)**

Reading and writing data to files (e.g., CSV, JSON)  
Data preprocessing and cleaning

**Week 6: Final Projects and Review (6 hours)**

Students will work on individual or group projects related to their physics research.  
Regular project updates and peer feedback.  
Review of key concepts and skills.  
Assessment and Grading:

Class participation: 10%

Homework assignments: 30%

Midterm project: 20%

Final project: 30%

Final presentation: 10%

**Textbook (recommended):**

"Python for Scientists" by John M. Stewart

This condensed syllabus focuses on core Python programming skills and their application in physics research within a 30-hour timeframe. The schedule is intensive, so students should be prepared to dedicate significant time outside of class for practice and projects.

**SUMMARY REPORT**

The course titled **COMPUTATIONAL PHYSICS AND PYTHON** introduced for final year UG students. Numerous students within the college expressed interest in learning Python programming. Additionally, 35 students, keen on programming, enrolled in the course. The course commenced on June 11, 2018, in an offline format. Theoretical sessions and practical exercises were facilitated. The course concluded successfully on September 08, 2018. This helped the students understand complex physical phenomenon using computational physics which is an invaluable tool in modern scientific research.



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**Dr. Ananthapadmanabha A.L.**





### ENROLLMENT LIST

Sl. No.	Reg. No.	NAME
1	GK16CPHR01	AYSHATH SHIFA
2	GK16CPHR02	FATHIMATH IRFANAIZZATH
3	GK16CPHR03	HAFIYA H M
4	GK16CPHR04	MARIYAMATH NIHALAN A
5	GK16CPHR05	ANUSREE A
6	GK16CPHR06	ARYA RAJ
7	GK16CPHR07	AYSHATH SHARFEENA
8	GK16CPHR08	DHANYASREE M K
9	GK16CPHR09	FAIROOZA A A
10	GK16CPHR10	HALEEMATH THAMEEMA T P
11	GK16CPHR11	MRUDULA N A
12	GK16CPHR12	PINKY K
13	GK16CPHR13	PRASANNA KUMARI J K
14	GK16CPHR14	SANGEETHA M
15	GK16CPHR15	SNEHA M
16	GK16CPHR16	SREELAKSHMI K V
17	GK16CPHR17	ANAND A N
18	GK16CPHR19	SHRUTHI P
19	GK16CPHR20	PAVAN KUMAR C S
20	GK16CPHR21	ANUSHA J
21	GK16CPHR22	GOPIKA A K
22	GK16CPHR23	HASEENA U A
23	GK16CPHR25	PRIYANKA VIJAYAN
24	GK16CPHR26	SHILPA A
25	GK16CPHR27	SUMITHRA M B
26	GK16CPHR28	AKHIL KUMAR A
27	GK16CPHR29	AKSHAY KUMAR P
28	GK16CPHR30	JISHNU P
29	GK16CPHR31	MADHURAJ K
30	GK16CPHR32	NANDU P BALAN
31	GK16CPHR33	NIJEESH KUMAR T
32	GK16CPHR34	SANET THOMAS M
33	GK16CPHR35	SHAMIL RAJ M
34	GK16CPHR36	SHINAS U
35	GK16CPHR37	JASEELATH SHIFANA B



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**Dr. Ananthapadmanabha A.L**







# Attendance Sheet:

Sl. No.	Roll No	NAME	Date														
			25/06/18			30/06/18			07/07/18			14/07/18			21/07/18		
1		Arunaktha S.K.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
2		Fathimath Iqbal Ismail	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3		Thapya H.H	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
4		Thiruvannam N.S.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5		Anvitha A	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6		Asya Raj	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
7		Aishwarya Shreejith	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
8		Divyashree H.K	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
9		Farheen A.A	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
10		Haleemath Manjesswarthy	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
11		Haleemath N.A	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
12		Prathy K	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
13		Darshanakumar J.K	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
14		Sangeetha H	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
15		Indira H	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
16		Tejalakshmi K.V	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
17		Anand A.N	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
18		Shreethi P	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
19		Darshanakumar C.S	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
20		Anusha J	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
21		Geethika A.K	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
22		Hareem N.A	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
23		Deviyanka Vijayan	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
24		Shilpa A	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
25		Sumithra H.B	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
26		Abhilash Kumar A	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
27		Ashwathy Kumar P	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
28		Techana P	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
29		Nadunay K	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
30		Nandana P. Balan	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
31		Mijesh Kumar T	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
32		Santhi Thomas H	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
33		Manish Raj H	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
34		Shirish V	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
35		Taralath Shilpa R	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
36			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

ADD-ON ROUTE - 2018-19  
STUDENTS' ATTENDANCE REGISTER

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36			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5



Name and Signature of the Principal  
Dr. Ananthapadmanabha A.L

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**Model Certificate:**





Name and Signature of the Principal  
**Dr. Ananthapadmanabha.A.L**

  
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