

DEPARTMENT OF PHYSICS, SACRED HEART COLLEGE, THEVARA

LEARNING UG PHYSICS WITH GNU OCTAVE

Value Added Course, Course Code: 17PHYVAC01

Instructor: Mathew George

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Time: 30 hours

Place: Physics Seminar Hall

Prerequisites: A basic understanding on the usage of computers. The students have to work with Octave on a regular basis. Bring your personal laptops. Access to computers can only be provided to limited number of students.

Objectives: This course will enable UG students to be proficient in doing data processing associated with their laboratory experiments and plotting graphs for preparing lab reports. The course also gives an introduction to doing theoretical simulations. The activities are arranged in such a way that a basic proficiency in Octave will be developed. The skills mastered are highly attractive for students opting for higher studies, as they will be useful during every phase of their studies. The skills developed will be equally beneficial to students who are opting for jobs in teaching / software / finance industry.

Course Outcomes:

- Be able to setup a working GNU Octave installation on a computer,
- Be proficient in the basic usage of Octave including writing scripts.

Syllabus:

1. ■ Module-1 Basic ideas and setting up (10 hours)

An introduction Octave, comparison with Matlab, demo of Octave usage / installation and setting up of Octave / simple calculations / variables / arrays / vectors / loading and saving data / loops (for / while) / plotting / octave scripts.

2. ■ Module-2 Experimental Data Analysis (10 hours)

Actual data sets of four UG experiments will be given for data processing. Students will have to do the calculations using an octave script developed by them. Reports to be typeset with \LaTeX .

3. ■ Module-3 Kater's Pendulum (10 hours)

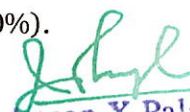
Simulation of a table top Kater's Pendulum. Design will be given. Simulations have to be done with Octave scripts.

Reference:

1. P. J. G. Long *Introduction to Octave*, (free E-book) by University of Cambridge.
2. Brij Lal & Subramaniam *Mechanics*, S Chand Publishing Company.

Grading Policy: Based on completion of assignments (80%), Viva (20%).




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