Centenary Academic Projects

(2021-2022)

By

Department of Mathematics

Union Christian College, Aluva

Centenary Academic Projects

The Department of Mathematics, Union Christian College, Aluva looks forward to conduct the following academic projects as part of Centenary celebrations of the College:

1. International Webinar Series on Pure and Applied Mathematics
2. Prof. M. Madhavankutty Memorial Lecture Series
3. National Conference on Advances in Mathematical Sciences
4. Training Programme on Basic and Advanced Data Analysis using SPSS
5. Refresher/Updation Course in Mathematics for School Faculty in the Unaided Sector
6. Online Certificate Courses
   (i)   Online certificate course in Basics of Python
   (ii)   Online certificate course in Geogebra
   (ii)   Online certificate course in basics of LaTex
7. Foundation Course for aspirants to a Mathematics B. Sc. Degree course

1. International Webinar Series on Pure and Applied Mathematics

Introduction

The Department of Mathematics would like to organize on International Webinar Series on Pure and Applied Mathematics with extensive support and participation from the distinguished alumni of the department. Diverse topics being covered in the series comprise highly relevant mathematical ideas including contemporary developments and recent trends.

Objectives

- To provide an excellent platform for the participants to learn and interact with eminent mathematicians.
- To motivate students to pursue higher education in mathematics

Action Plan

- Organize at least five webinars in the series
- Cover a wide range of highly relevant topics in Mathematics
- Collaborate with the vibrant alumni network effectively and leverage its extensive research and industry expertise.
- Platform: Google meet and YouTube streaming

Target group

The webinar series is intended for Faculty, Research Scholars, UG and PG students from different Universities and Colleges.

2. Prof. M. Madhavankutty Memorial Lecture Series

Introduction

A legendary teacher-cum-academic, who was pivotal in developing this department and also the college on par with other academic institutes of excellence, Prof. M. Madhavankutty's name is still held in high esteem by one and all, especially the students of yore. This series seeks to keep the flames of memory of this great personality forever ardent.

Objectives

Envisioned as a platform where alumni and former staff (for whom the memory of the late Madhavankutty sir is ever so dear) can interact with the current faculty and students; also, the lectures will be customized to keep the current status of the field of mathematics adept and fresh.

Action Plan

The programme will be put in place with the already assured assistance of our departmental alumni and also certain friends of Prof. M. Madhavankutty sir.

Target Group

The entire Mathematics department and Mathematics students and faculty from neighbouring colleges.

Financial Assistance

To be met by departmental alumni and also certain friends of Prof. M. Madhavankutty.

3. National Conference on Advances in Mathematical Sciences

Introduction

The pandemic situation now is not hindering the advances in science and technology. Hoping a change in the current situation, the department wishes to organize a national level conference in an offline mode to introduce new theoretical directions and applications in Mathematics. The conference is intended for two days in January 2022 with lectures, invited talks and paper presentations by young researchers in all areas of pure and applied Mathematics. It will be a common platform for Faculty/Researchers to discuss current developments and challenging issues in various fields of Mathematics.

Objectives

- ➢ To promote research and to motivate those who wish to pursue Mathematics in the areas of teaching or research
- ➢ To enhance credibility of the department as well as the college in securing better positions in national and international accreditation and ranking.
- ➢ An opportunity for the students to interact with eminent personalities and to understand Mathematics in a broad sense
- ➢ To help students to develop skills in organizing events.

Target Group

Faculty/Researchers in various institutions, Post graduate students.

Financial Assistance

With sponsorship from KSCSTE/RUSA or other Higher Educational agencies.

4. Training Programme on Basic and Advanced Data Analysis using SPSS

Introduction

When most people think of data analysis, they think of complex mathematical formulae. The advent of computer software programs has however meant that people do not have to know or learn mathematical formulae to be able to perform quantitative statistical analysis. SPSS - Statistical Package for the Social Sciences is one such software used to analyse data. SPSS offers extensive data-handling capabilities and numerous statistical analysis routines that can analyse small as well as very large data statistics. Today SPSS is one of the most widely used statistical tools by market researchers, health researchers, survey organizations, and governments for statistical analysis.

Department of Mathematics would like to design a two-day training programme on Basic and Advanced Data Analysis using SPSS to enhance understanding of research in general and data analysis in particular among practitioners and scholars. The purpose of the training programme is to augment knowledge and skills for researchers and operational level functionaries involved in data analysis, interpretation and decision making.

Objectives

- Developing requisite skills to bring-in and transform data using SPSS
- Enhancing knowledge and developing skills for selecting and performing appropriate analysis
- Augmenting knowledge and skills for interpretation and presentation of analysis

Action Plan

- 10 hours of classroom tutorial
- Rigorous hands-on practice using real data sets

Target Group

Faculty/Researchers in various institutions

Financial Assistance

Collect fees from participants

5. Refresher/Updation Course in Mathematics for School Faculty in the Unaided Sector

Introduction

This is conceived as a Social Responsibility Venture that will redeem a lacuna. The lacuna pertains to the fact that unlike their counterparts in the Aided/Government educational sector, members of the unaided stream often stand denied of platforms where they can update themselves academically. This venture would offer them such an opportunity.

Objectives

To provide 2-3 day 'intensive' academic orientation and updation in the field of mathematics to school faculty

Action Plan

The current and if need be former faculty of our department will lead the sessions that will, preferably be designed to fall on weekends/short holidays. Also, electronic material pertaining to the field will be generated and provided to the participants, along with a certificate attested by the Institution.

Target Group

School faculty in the Mathematics discipline

Financial Assistance

Part of the costs will be recovered via affordable registration fee from the participants; a part of the cost will be met from the departmental fund; and it is expected that the management too will chip in with a helping hand.

6. Online Certificate Courses

(i)   Online certificate course in Basics of Python

Introduction

The python language is one of the most accessible programming languages available because it has simplified syntax and not complicated, which gives more emphasis on natural language. Due to its ease of learning and usage, python codes can be easily written and executed much faster than other programming languages.

It is a general purpose programming language. Hence, we can use the programming language for developing both desktop and web applications. Also, it can be used for developing complex scientific and numeric applications. Python is designed with features to facilitate Scientific and Mathematical computing, data analysis and visualization.

Objectives

- To learn how to design and program Python applications.
- To learn how to use lists, tuples, and dictionaries in Python programs.
- To learn how to identify Python object types.
- To learn how to use indexing and slicing to access data in Python programs.
- To define the structure and components of a Python program.
- To learn how to write loops and decision statements in Python.
- To learn how to write functions and pass arguments in Python.
- To learn how to build and package Python modules for re usability.
- To learn how to read and write files in Python.
- To learn how to design object-oriented programs with Python classes.
- To learn how to use class inheritance in Python for re usability.
- To learn how to use exception handling in Python applications for error handling.

Action Plan

Recorded classes through Google Classroom and arrange live sessions at computer lab.

Target group

UG Students

Financial Assistance

Collect fees from students.

(ii) Online certificate course in Geogebra

Introduction

GeoGebra offers geometry, algebra and calculus features in a fully connected, compacted and easy-to use software environment. Designed specifically for educational purposes, GeoGebra can help students grasp experimental, problem-oriented and research-oriented learning of Mathematics, both in the classroom and at home.

GeoGebra was created to help students gain a better understanding of mathematics. Students can manipulate variables easily by simply dragging "free" objects around the plane of drawing, or by using sliders. Students can generate changes using a technique of manipulating free objects, and then they can learn how the dependent objects will be affected. In this way, students have the opportunity to solve problems by investigating mathematical relations dynamically.

Action Plan

Recorded classes through Google Classroom and arrange live sessions at computer lab.

Target group

UG Students

Financial Assistance

Collect fees from students.

(iii)   Online certificate course in basics of LaTex

Introduction

LaTeX, is a document preparation system for high-quality typesetting. It is most often used for medium-to-large technical or scientific documents but it can be used for almost any form of publishing and it is not a word processor.

LaTeX Features

➤ Typesetting journal articles, technical reports, books, and slide presentations.

➤ Control over large documents containing sectioning, cross-references, tables and figures.

➤ Typesetting of complex mathematical formulas.

➤ Advanced typesetting of mathematics with AMS - LaTeX.

➤ Automatic generation of bibliographies and indexes.

➤ Multi-lingual typesetting. Inclusion of artwork, and process or spot colour.

➤ Using Post Script or Meta font fonts.

Action Plan

Recorded classes through Google Classroom and arrange live sessions at computer lab.

Target group

UG Students

Financial Assistance

Collect fees from students.

7. Foundation Course for aspirants to a Mathematics B. Sc. Degree course

Introduction

Mathematical thinking is not the same as doing Mathematics - at least not as Mathematics is typically presented in our school system. School maths typically focuses on learning procedures to solve problems. As graduation level is a transformation from school, it will be highly recommended to go through a foundation course like this, especially to the subject Mathematics. Besides, the pandemic situation prevailed in the world affected the normal studies in the last year. In the light of all these, we are planning to give a foundation course in Mathematics which will be useful for all the aspiring graduation students. This Foundation Course for aspirants to a Mathematics B. Sc. Degree course will end up as a bridge course, in the sense that it will upgrade students conceptually to the minimum expected standards in a Bachelors programme.

Objectives

- ➢ To gain better understanding of the mathematical concepts.
- ➢ To provide a transition platform from school to higher level.
- ➢ To learn skills like logical thinking, critical analysis, abstract thinking and problem solving.
- ➢ To equip the students with the knowledge and the confidence needed to take on bigger challenges.

Action Plan

We are planning to conduct a short term course in offline mode. Announcing such a short-term tenure in Plus-2 schools; after their results are announced, and then shortlist a manageable bunch who will be tutored before June, of every academic year. – The classes will be monitored by the department faculty and the on-the-floor delivery will be by fresh alumni who have completed their Masters programme.

Target Group

Students who have passed the higher secondary examination, and who are interested in pursuing Mathematics at the Undergraduate level

Financial Assistance

To be met from the Department fund with expected additional inputs from the management.