AICTE-QIP SPONSORED SHORT TERM COURSE

ON

FOURIER SERIES, TRANSFORM TECHNIQUES AND THEIR APPLICATIONS

https://sites.google.com/view/stcfstt/

(FEBRUARY 25 - MARCH 01, 2018)

at

Indian Institute of Technology Kharagpur
Kharagpur, India – 721302

Organized by
Department of Mathematics
Indian Institute of Technology Kharagpur
Kharagpur, India – 721302

About the Institute

The Indian Institute of Technology Kharagpur was established by the government of India in 1951. The first of the IITs to be established, it is recognized as an Institute of National Importance by the government of India. The institute was established to train scientists and engineers after India attained independence in 1947. It shares its organizational structure and undergraduate admission process with sister IITs. IIT Kharagpur has the largest campus (2,100 acres), the most departments, and the highest student enrolment. Currently IIT Kharagpur has about 550 faculties, 1700 employees and 9000 students in the campus.

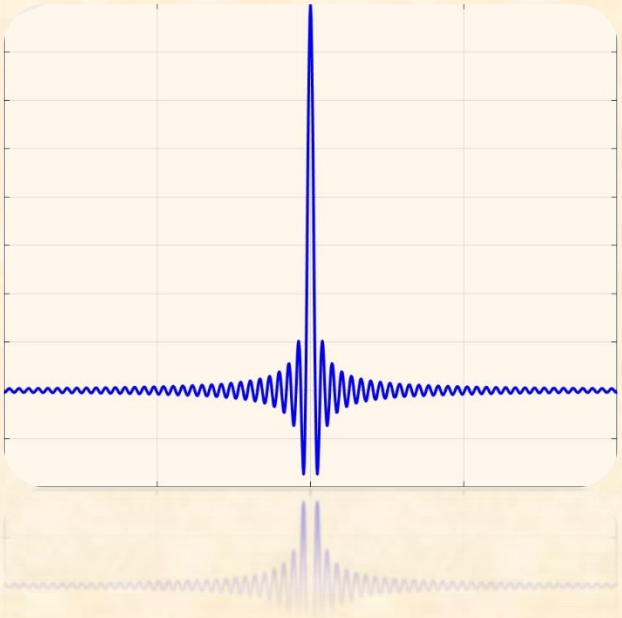
About the Department

The Department, since its inception in 1951, has been actively engaged in teaching and research in various branches of mathematical Sciences. The department offers core courses at under graduate level and several courses at postgraduate level. The courses are also designed to prepare students for further graduate work at the Ph.D. level. The Department offers 2-Year M.Sc. programme in Mathematics, 5-Year M.Sc. programme in Mathematics and Computing and M.Tech. programme in Computer Science and Data Processing. Department also enrolls candidates for Ph.D. program. There is a wide spread interaction between mathematics department and various engineering departments in the field of teaching and research.

Course Overview

The transform techniques and Fourier series are some of the most powerful mathematical tools that can be used to solve a wide variety of problems in Science and Engineering including communications, image processing, signal processing, circuit design, optics, coding theory, finance, quantum mechanics, geology, astronomy, and many other fields.

This short term course aims to present fundamental concepts of Fourier series, Fourier transforms and



Laplace transforms. Different notions of convergence of series mainly pointwise convergence, mean square convergence and uniform convergence are essential for discussing the Fourier series. A connection of different notions of convergence in view of Fourier series needs to be explored in depth. Existence and uniqueness of Fourier series and different transforms are necessary for basic understanding of these topics. Results on convergence of the series obtained after term by term integration and differentiation of Fourier series are some of the important topics that will be covered in these lecture. A variety of applications on solutions of different mathematical models including initial and boundary value problems, partial differential equations, integro differential equations and integral equations are also included in this course.

Course contents

Orthogonal and Orthonormal Trigonometric Systems; Introduction to Fourier Series; Construction of Fourier Series; Existence and Uniqueness of Fourier Series; Point-wise Convergence; Mean Square Convergence;

Uniform Convergence; Different Convergence Theorems; Best Trigonometric Polynomial Approximation; Half Range Sine and Cosine Series; Integration and Differentiation of Fourier Series and their Convergence Issues; Parseval's Identity; Complex Fourier Series; Fourier Integral; Applications of Fourier Series to Partial Differential Equations; Connection - Fourier Series to Fourier Transform; Fourier Sine and Cosine Transform; Inverse Fourier Transform; Convolution; Properties of Fourier Transform; Discrete Fourier Transforms; Applications of Fourier and Discrete Fourier Transform to Partial Differential Equations;

Introduction to Laplace Transform; Existence and Uniqueness of Laplace Transform; Inverse Laplace Transform; Properties of Laplace and Inverse Laplace Transform; Laplace Transform of Some Special Functions including Impulse Function, Error Functions, Bessel's Functions, Laguerre polynomials; Applications of Laplace Transform to Initial Value Problems, Boundary Value Problems, Integral Equations, Integro-Differential Equations

Course Coordinators

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Course Web-Page:
https://sites.google.com/view/stcfstt/

Eligibility

***Category A**. The eligible participants are teachers of AICTE approved degree level Engineering Colleges only.*

***Category B**. Industry/ Institute Sponsored Participants with above mentioned academic background.*

Registration

Number of participants for the course will be limited to thirty.

The course is free for participants of Category A.

The course fee for Sponsored Candidates (Category B) is Rs. 5,000/- for students and Rs. 10,000/- for others. Registration fee includes study materials only.

Accommodation

Category A participants will be provided in AC accommodation in one of the institute Guest Houses free of charge. For others, accommodation may be arranged on payment basis.

TA as per rule (Ac-3 tier) will be paid to Category A.

Important Dates

Last date of registration:	*January, 15, 2019*
Start of the Course:	*February 25, 2019*
End of the Course:	*March 01, 2019*

How to reach

Situated about 120 km west of Kolkata, Kharagpur can be reached in about 2 hours by train from the Howrah railway station of Kolkata or 3 hours by car from Kolkata Airport. Kharagpur is also connected by direct train services to most major cities of the country. The Institute is about 10 minutes' drive (5 km) from the Kharagpur railway station and 5 minutes' drive (2 Km) from Hijli Railway Station. Private taxi, auto rickshaw or cycle rickshaw can be hired to reach the Institute.

How to Apply

Procedure for applying in IIT Kharagpur online Course Registration portal Use the link:

https://erp.iitkgp.ernet.in/CEP/courses.htm

Step to be followed:

*1. Sign-Up***
2. Verify your email-id (link will be send to your e-mail)
3. Login
4. Edit Profile (Fill up all the mandatory fields, upload photo and signature)
5. Click on 'APPLY NOW' button.
6. Upload your pdf format id-card.
An e-mail will be communicated from the Continuing Education Program, IIT Kharagpur to the shortlisted applicants for completing the registration.

** *This is one time sign up process in apply to IIT Kharagpur online Course Registration portal*. You can apply to other courses using the same credential.

For any queries please send E-mail to:
maths.kgp@gmail.com