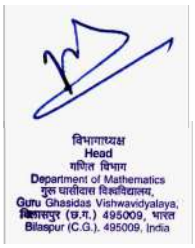
Department : Mathematics		
Academic Year : 2023-24		
Sr. No.	**Programme Code**	**Name of the Programme**
01.	114	B.Sc. (Honours) (Dessertation/Project)



A Project Report On

FOURIER TRANSFORM

Department of

Mathematics

Guru Ghasidas Vishawavidyalay

Submitted by:
Shyam Sundar Bidoya
B.Sc. VI Sem. (Mathematics)
Roll no. : 21074159
Enroll no. : GGV/21/05559

Supervised by:
Prof. **A.K. Thakur**
(H.O.D.)
Mathematics Department

DEPARTMENT OF MATHEMATICS
GURU GHASIDAS
VISHWAVIDYALAYABILASPUR
(C.G)-495009

CERTIFICATE

This is to certify that the work described in the project entitled **"Fourier Transform"** submitted by **Shyam Sunar Bidoya** student of 3rd year in B.sc. Mathematics at Department of Mathematics, **Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)** has successfully completed his project under the guidance of **Dr. A.K. Thakur.**

To the best of my knowledge, the results embodied in this project report have not been submitted to any other university or Institute for the award of any other degree.

Date: .....

.....

Prof. **A.K. Thakur**

Supervisor

(H.O.D.)

CONTENT

A project Report on

LAPLACE TRANSFORM

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA

Submitted by:

Prakash Singh Thakur

B.Sc. VI sem (Mathematics)

Roll no. : 21074152

Enroll no. : GGV/21/05552

Supervised by :

Prof. **A.K. Thakur**

(H.O.D.)

Mathematics Department

DEPARTMENT OF MATHEMATICS
GURU GHASIDAS VISHWAVIDYALAYA
BILASPUR(C.G)-495009

CERTIFICATE

This is to certify that the work described in the project entitled **"Laplace Transform"** submitted by **Prakash Singh Thakur** student of 3rd year in B.sc. Mathematics at Department of Mathematics, **Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)** has successfully completed his project under the guidance of **Dr. A.K. Thakur.**

To the best of my knowledge ,the results embodied in this project report have not been submitted to any other university or Institute for the award of any other degree.

Date : 09/05/2024

.....

Prof. **A.K. Thakur (H.O.D.)**
Supervisor

ABSTRACT

An introducation to Laplace Transform is the topic of this paper. It deals with what Laplace Transform is, and what is it actually used for. The definition of Laplace Transform and most of its important properties have been mentioned. This paper also includes a overview of Inverse Laplace Transform and formulation of both Laplce and Inverse Laplace Transform. A few applications of Laplace Transform have also been stated.

PLANE WAVE PROPAGATION IN MICROPOLAR MATERIAL

A

Project Report Submitted

In partial fulfillment for the degree of

BACHELOR OF SCIENCE IN MATHEMATICS

By

KUMAR DEV

Roll no: 21074136

Registration no: GGV/21/05536

SESSION: 2021-2024

Under the guidance Of **Dr. BIJENDRA PASWAN**

Department of Pure and Applied MATHEMATICS

GURUGHASIDAS VISHWAVIDYALAYA BILASPUR (C.G.),

INDIA

Certificate from the Supervisor

This is to certify that the report entitled "WAVE PROPAGATION IN MICROPOLAR MATERIAL" carried out by Mr. Kumar Dev, of Department of Pure and Applied Mathematics, Bilaspur, for the partial fulfillment of the requirements for the degree of BACHELOR OF SCIENCE IN MATHEMATICS, GGV, Bilaspur, is absolutely carried out by her under my supervision and guidance.

To the best of our knowledge, these results have not been submitted by her for the award of any other degree or diploma.

08/05/2024

Dr. BIJENDRA PASWAN
Department of Pure and Applied Mathematics
GURUGHASIDAS VISHWAVIDYALAYA
Bilaspur (C.G.), 495009,INDIA

Content

Distribution Function

A

Project Report Submitted

In partial fulfillment for the degree of

BACHELOR OF SCIENCE IN MATHEMATICS

By

Mr. Ram Chandra

Roll no: 21074155

Registration no: GGV/21/05555

SESSION: 2021-2024

Under the guidance Of

Dr. Manish Kumar Gupta

Assistant Professor

Department of Pure and Applied Mathematics

GURUGHASIDAS VISHWAVIDYALAYA

BILASPUR (C.G.), INDIA

CERTIFICATE

This is to certify that the report entitled **"DISTRIBUTION FUNCTION"** carried out by **RAM CHANDRA,** of Department of Pure and Applied Mathematics, Bilaspur, for the partial fulfillment of the requirements for the degree of BACHELOR OF SCIENCE IN MATHEMATICS, at GGV, Bilaspur, is absolutely carried out by his under my supervision and guidance.

To the best of our knowledge, these have not been submitted by him for the award of any other degree or diploma.

09/5/24

Dr. MANISH KUMAR GUPTA

ASSISTANT PROFESSOR

Department of Pure and Applied Mathematics

GURU GHASIDAS VISHWAVIDYALAYA

Bilaspur (C.G.), 495009, INDIA

CONTENT

Importance of Vedic Mathematics in Present Era

A Dissertation Submitted
In partial fulfillment for degree of
Bachelor of Science in Mathematics

Submitted By

Mithilesh Kumar Kaushik

Under the supervision of

Dr. B.B Chaturvedi

Department of Mathematics

Guru Ghasidas Vishwavidyalaya

Koni- Bilaspur 495009 (C.G.)

2024

Guru Ghasidas Vishwavidyalaya
Koni- Bilaspur 495009 (C.G.)
(A Central University Established under Central University Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that **Mithilesh Kumar Kaushik** has worked for B.Sc. (Mathematics) dissertation entitled **"Importance of Vedic Mathematics in present era "** under my supervision for about 3 months and this work has not been formed the basis for the award of any other similar title.

It represents entirely an independent work on the part of candidate.

B B Lauby
09/05/2024

Signature of Supervisor

Date:**09/05/2024**

Place: **Bilaspur**

Table of content

A PROJECT REPORT

on

"NUMERICAL INTEGRATION"

Submitted for partial fulfilment of the

Requirement of the Award of the Degree of

BACHELOR OF SCIENCE

By

SAVITA RATHIA

Enrollment No. (GGV/21/05557)

UNDER THE SUPERVISION OF

DR. KANKAN SARKAR

DEPARTMENT OF MATHEMATICS

SCHOOL OF STUDIES OF MATHEMATICAL & COMPUTATIONAL SCIENCE

GURU GHASIDAS VISHWAVIDYALAYA,

BILASPUR (C.G.)

APRIL 2023 (Term – 2023-24)

SUPERVISOR'S CERTIFICATE

This is to certify that Savita Rathia (Enrollment No. GGV/21/05557) has completed her project entitled **"Numerical Integration"** under my guidance and supervision. To the best of my knowledge, it is her original work and is fit for the B.SC Project.

09/05/24

Dr. Kankan Sarkar

Associate Professor,

Department of Mathematics

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CONTENTS

PLANE WAVE PROPAGATION IN MONOCLINIC MATERIAL

A

Project Report Submitted

In partial fulfillment for the degree of

BACHELOR OF SCIENCE IN MATHEMATICS

By

VIVEK NETAM

Roll no: 21074171

Registration no: GGV/21/05571

SESSION: 2021-2024

Under the guidance

Of

Dr. BRIJENDRA PASWAN

Department of Pure and Applied MATHEMATICS

GURUGHASIDAS VISHWAVIDYALAYA BILASPUR (C.G.),

INDIA

Certificate from the Supervisor

This is to certify that the report entitled "PLANE WAVE PROPAGATION IN MONOCLINIC MATERIAL" carried out by Mr. Vivek Netam, of Department of Pure and Applied Mathematics, Bilaspur, for the partial fulfillment of the requirements for the degree of BACHELOR OF SCIENCE IN MATHEMATICS, GGV, Bilaspur, is absolutely carried out by her under my supervision and guidance.

To the best of our knowledge, these results have not been submitted by her for the award of any other degree or diploma.

08/05/2024

Dr. BRIJENDRA PASWAN
Department of Pure and Applied Mathematics
GURUGHASIDAS VISHWAVIDYALAYA
Bilaspur (C.G.), 495009, INDIA

CONTENT

A PROJECT REPORT

On

DETERMINANTS AND EIGENVECTORS

By

Akhil Singh

Roll no. 21074104

Enrollment No. GGV/21/05504

UNDER THE SUPERVISION OF

Dr. A.S. Ranadive

DEPARTMENT OF MATHEMATCS

GURU GHASIDAS VISHWAVIDYALAYA

BILASPUR (C.G.) (Term- 2023-24)

SUPERVISOR'S CERTIFICATE

This is to certify that Akhil Singh (Enrollment No.GGV/21/05504) has completed his project entitled "Determinants and Eigenvectors" under my guidance and supervision. To the best of my knowledge, it is his original work and is fit for evaluation for the B.Sc.. Project.

Dr. A.S. Ranadive
Department of Mathematics
Guru Ghasidas Vishwavidyalaya

Contents

A

PROJECT

ON

ORDINARY DIFFERENTIAL EQUATIONS

SESSION-2021-2024

SUBMITTED BY

AYUSHI SAHU

(ENROLLMENT NO.GGV/21/05520)

ROLL NO. 21074120

UNGER THE GUIDENCE OF

DR. KANKAN SARKAR

(ASSOCIATE PROFESSOR)

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA

BILASPUR (C.G.)

SUPERVISOR'S CERTIFICATE

This is to certify that the project work entitled **"ORDINARY DIFFERENTIAL EQUATIONS"** has been carried out entirely by **AYUSHI SAHU (ENROLLMENT NO.GGV/21/05520) ROLL NO. 21074120** a student of B.Sc. VI Semester under my supervision and that the candidate has fulfilled the requirements of the regulations laid down for the Degree of Bachelor of Science. Of the Guru Ghasidas Vishwavidyalaya.

Date: 08-05-2024

08/05/24

Head
Department of Mathematics
Guru Ghasidas
Vishwavidyalaya
Bilaspur (C.G.)

DR. KANKAN SARKAR
(Associate Professor)
Department of Mathematics
Guru Ghasidas
Vishwavidyalaya
Bilaspur (C.G.)

Ordinary Differential Equations

INTRODUCTION

An ordinary differential equation (ODE) is an equation involving an unknown function of one variable and some its derivatives, while a partial differntial equation (PDE) can be defined as is an equation involving an unkown function of two or more variables and certian of its partial derivatives.

Examples

1- The equation

$$\frac{du}{dt} = y^2, \tag{2.1}$$

where $u : R \longrightarrow R$, is an ODE .

2- The equation

$$\frac{\partial u}{\partial t} = \frac{\partial^2 y}{\partial x^2},$$

where $u : R^2 \longrightarrow R$, is a PDE.

Remark 2.1. in the ODEs we may refer for simplisity $\frac{dy}{dt} = y_t$ or y', therefore equation (2.1) can be rewrittin in this way $y' = y^2$.

A PROJECT REPORT

ON

HEAT EQUATION AND IT'S APPLICATION

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF

BACHELOR OF MATHEMATICS

By

AMIT CHOUDHARY

Enrollment No. (GGV/21/05506)

UNDER THE SUPERVISION OF

Dr. BRAJ BHUSHAN CHATURVEDI

Assistant professor

DEPARTMENT OF MATHEMATICS

SCHOOL OF MATHEMATICS & COMPUTER SCIENCE

GURU GHASIDAS VISHWAVIDYALA BILASPUR (C.G)

APRIL 2024 (TERM-2021-24)

SUPERVISOR'S CERTIFICATE

This is to certify that Amit Choudhary (Enrollment No. GGV/21/05506) has completed his project entitled "**HEAT EQUATION AND IT'S APPLICATION**" under my guidance and supervision. To the best of my knowledge it is his original work and is fit for evaluation for the BSc Mathematics (hons.) Project.

BB Laudy
08/05/24

Dr. Braj Bhushan Chaturvedi

Assistant Professor

Department of Mathematics,

CONTENT:-

Page No.-

A project report

On

SURVEY ON GENERALIZATIONS OF KANNAN CONTRACTION AND ITS APPLICATIONS

Submitted to the

DEPARTMENT OF MATHEMATICS ,

GURU GHASIDAS VISHWAVIDYALAYA

As a partial fulfilment of the requirements

For the B.Sc Degree

PROJECT GUIDE :

Mr. CP DHURI

(Assistant Professor)

Signature :

SUBMITTED BY :

MANISHA YADAV

21074139

B.Sc , VI Semester

Signature : Manisha Yadav

CERTIFICATE

This is to certify that the project entitled **SURVEY ON GENERALIZATIONS OF KANNAN CONTRACTION AND ITS APPLICATION** is submitted by **MANISHA YADAV** in the partial fulfilment for the requirement for the bachelor's degree in mathematics at department of mathematics, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) is authentic work carried out by her under my guidance and supervision

Date : 8 may 2024

Project Guide

Mr. C.P. Dhuri

(Assistant Professor)

Department of mathematics

Dr. A.K. Thakur

(Head of department)

Department of mathematics

Abstract:-

Groundwater flow modelling is essential for understanding the dynamics of subsurface water movement, influencing various environmental and engineering applications. Traditional models often struggle to accurately represent the complexities of aquifer behaviour, including non-local interactions and memory-dependent processes. This study investigates the integration of fractional calculus into groundwater flow modelling, aiming to enhance predictive capabilities. Through theoretical groundwork, numerical simulations, and case studies, the research illustrates how fractional calculus techniques can capture these intricate phenomena. Practical implications are explored, highlighting the potential for improved groundwater management strategies. While challenges exist, fractional calculus offers a promising approach to advance groundwater flow modelling and address pressing water resource issues.

"CONTRIBUTION OF THE GREAT MATHEMATICIAN S.RAMANUJAN"

A

Dissertation submitted to
Guru Ghasidas Vishwavidyalaya, Bilaspur

In the Partial fulfillment of the requirement for the award of the Degree of

Bachelor of Science
In
Mathematics

Department of Pure and Applied Mathematics
Guru Ghasidas Vishwavidyalaya
Koni, Bilaspur (C.G.)

Under the guidance of
Dr. Manish Kumar Gupta Sir

Submitted by:
Kanchan Lata Rajak
B.sc Mathematics 6th sem
Roll no.: 21074128

Department of Pure and Applied Mathematics

Guru Ghasidas Vishwavidyalaya

Koni, Bilaspur (C.G.)

CERTIFICATE

This is to certify that the dissertation titled **"CONTRIBUTION OF THE GREAT MATHEMATICIAN S.RAMANUJAN"** submitted by **KANCHAN LATA RAJAK** (Roll no.: 21074128) is record of original and independent study carried out under my guidance.

This report prepared by his original and has formed a basis for the award of any other Degree/Diploma by **GURU GHASIDAS VISHWAVIDYALAYA** or any other university.

DATE: 08/05/2024

Dr. Manish Kumar Gupta Sir

Department of Mathematics

Guru Ghasidas Vishwavidyalaya

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PROJECT REPORT

ON

Introduction to API (Application Programming Interface)

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF

BACHELOR OF MATHEMATICS

By

RAJ BHAGAT

Enrollment No.
(GGV/21/05554)UNDER
THE SUPERVISION OF

Dr. Penumarthy parvateesam murthy
Assistant professor
DEPARTMENT OF MATHEMATICS
SCHOOL OF MATHEMATICS & COMPUTER SCIENCE
GURU GHASIDAS VISHWAVIDYALA BILASPUR

APRIL 2024 (TERM-2021-24)

Department of Mathematics
Guru Ghasidas Vishwavidyalaya, Bilaspur, (C.G.)
(A Central University Established by the Central University Act,2009
No. 25 of 2009)

Certificate

This is to certify that RAJ BHAGAT (Enrollment No.- GGV/21/05554, Roll No. 21074154) has submitted his review entitled "INTRODUCTION OF API" under the supervision of Mr. . Penumarthy parvateesam murthy toward partial fulfillment of degree of Bachelors of science in Mathematics.

The review is original and has not been submitted anywhere else for this or any other degree.

Penumarthy Parvateesam Murthy
supervisor

Prof.
Professor & head
Dr. Amarnath Kumar thakur

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GURU GHASIDAS VISHWAVIDYALAYA BILASPUR

(A Central University Established by the Central Universities Act,2009 No 25 of 2009)

DEPARTMENT OF MATHEMATICS

SESSION - 2023-24

A Dissertation project on the topic
Ordinay differential equation

Submitted to
Dr B.B. Chaturvedi
Department of mathematics

Submitted by
Bhawana Choudhary
Enrollment number -
GGV/21/05522
ROLL NO-21074122

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University established by the Central Universities Act 2009 No. 25 of 2009, Bilaspur, C.G.)

CERTIFICATE OF APPROVAL

This is to certify that Miss BHAWANA CHOUDHARY of B.Sc. 6th semester at Department of Mathematics of Guru GhasidasVishwavidyalaya, Bilaspur (C.G.) bearing Roll no. 21074122,Enrollment no. GGV/21/05522 has developed project work entitled "ORDINARY DIFFERENTIAL EQUATION" is hereby approved as a credible work for the award of the degree of Bachelor of Science in Electronics (Hons.).

DR. B.B. CHATURVEDI
ASSISTANT PROFESSOR
Department of Mathematics
GGV, Bilaspur (C.G.)

Contents

Dissertation Report

Submitted for partial fulfilment of the degree of

B.Sc. Mathematics Honours

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central university established by Central University Act 2009 No. 25 of 2009)

By

Ashutosh kotwal

Roll no. 21074116

Enrolment no. GGV/21/05516

Under the supervision of

Dr A.K. Thakur

(Professor and head of the department)

Department of Mathematics

Guru Ghasidas Vishwavidyalaya, Bilaspur

(C.G.), 495009, India

(Session 2023-2024)

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, (C.G.)

(A Central university established by Central University Act 2009 No. 25 of 2009)

CERTIFICATE

This is to certify that dissertation report on "PARTIAL DIFFERENTIAL EQUATIONS" is an authentic record of study reviewed by *Ashutosh kotwal*, a student of B.Sc. Mathematics VI semester, Department of Mathematics of this university.

Dr.A.K. Thakur

Professor and Head of Department

Email:drakthakurmath@gmail.com

Date_____.

Sign._____

Place_____

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GURU GHASIDAS VISHWAVIDALAYA, BILASPUR (C.G.)

DISSERTATION REPORT ON INTERPOLATION

Submitted for the
Partial fulfilment of the requirement for the award of Degree
Of B.Sc. Mathematics (Hons.)

DEPARTMENT OF MATHEMATICS

INTERPOLATION

SUBMITTED BY: AYUSH LAXME
ENROLLMENT NO. – GGV/21/05518
ROLL NO. - 21074118

DEPARTMENT OF MATHEMATICS
GURU GHASIDAS
VISHWAVIDYALAYA
BILASPUR(C.G)-495009

CERTIFICATE

This is to certify that the work described in the project entitled **"Interpolation"** submitted by **Ayush Laxme** student of 3rd year in B.SC. Mathematics at Department of Mathematics, **Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)** has successfully completed his project under the guidance of **Dr. D. Gopal**

To the best of my Knowledge the results embodied in this project report have not been submitted to any other university or Institute for the award of any other degree.

Date : 08/05/24

.....

DR. D. Gopal (Associate Professor)
Supervisor

Index

A Project Report On

DATA SCIENCE AND APPLICATION

Department of Mathematics

Guru Ghasidas Vishawavidyalay

Submitted by:
Arpit Kumar Sahu
B.Sc. VI Sem. (Mathematics)
Roll no. : 21074114
Enroll no. : GGV/21/05514

Supervised by:
Dr. P.P. Murthy
Professor
Mathematics Department

DEPARTMENT OF MATHEMATICS GURU GHASIDAS VISHWAVIDYALAYA BILASPUR (C.G)-495009

CERTIFICATE

This is to certify that the work described in the project entitled **"Data Science and Application"** submitted by **Arpit Kumar Sahu** student of 3rd year in B.sc. Mathematics at Department of Mathematics, **Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)** has successfully completed his project under the guidance of **Dr.P.P. Murthy.**

To the best of my Knowledge, the results embodied in this project report have not been submitted to any other university or Institute for the award of any other degree.

Date: 6/05/2024.

.....

Dr. P.P. Murthy
Supervior

Dr. A.K. Thakur (H.O.D.)
Department of Mathematics

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A PROJECT REPORT

ON

INDIAN MATHEMATICIANS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF

BACHELOR OF SCIENCE

By

Ankesh Suman

Enrollment No. (GGV/21/05511)

UNDER THE SUPERVISION OF

Dr. Manish Kumar Gupta

Assistant Professor

DEPARTMENT OF MATHEMATICS

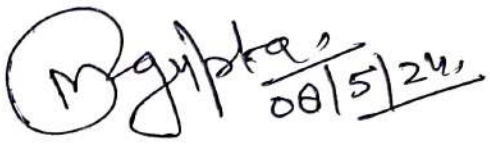
SCHOOL OF MATHEMATICS AND COMPUTER SCIENCE

GURU GHASIDAS VISHWAVIDYALA BILASPUR (C.G)

APRIL 2024 (TERM-2021-24)

SUPERVISOR'S CERTIFICATE

This is to certify that Ankesh Suman (Enrollment No. GGV/21/05511) has completed his project entitled "Indian Mathematicians" under my guidance and supervision. To the best of my knowledge, it is his original work and is fit for evaluation for the B.Sc. (Mathematics hons.) Project.



Dr. Manish Kumar Gupta

Assistant Professor

Department of Mathematics

CONTENTS

A PROJECT REPORT

ON

REFLECTION AND TRANSMISSION OF WAVES IN FIBER REINFORCEMENT OF MATERIALS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF

BACHELOR OF MATHEMATICS

By

ASHUTOSH PATKER

Enrollment No. (GGV/21/05517)

UNDER THE SUPERVISION OF

Dr.BRIJENDRA PASWAN

Assistant professor

DEPARTMENT OF MATHEMATICS
SCHOOL OF MATHEMATICS & COMPUTER SCIENCE
GURU GHASIDAS VISHWAVIDYALA BILASPUR (C.G)

APRIL 2024 (TERM-2021-24)

SUPERVISOR'S CERTIFICATE

This is to certify that Ashutosh patker (Enrollment No. GGV/21/05517) has completed his project entitled "**REFLECTION AND TRANSMISSION OF WAVES IN FIBER REINFORCEMENT OF MATERIALS**" under my guidance and supervision. To the best of my knowledge it is his original work and is fit for evaluation for the Bsc maths (hons.) Project.

08/05/2024

Dr. Brijendra paswan

Assistant Professor

Department of Mathematics,

Contents :-

****

A

PROJECT REPORT

ON

SUMMING THROUGH RAMANUJAN'S WAY, BERNOULLI NUMBERS AND ZETA FUNCTIONS

SESSION – 2023-24

Submitted To

Dr. M. K. Gupta
(Assistant Professor)

Submitted By

Abhay Ingley
B.Sc.(Hons.) VI Sem

Roll No.-21074101

Enrollment No.-GGV/21/05501

DEPARTMENT OF MATHEMATICS

GGV, BILASPUR, C.G., INDIA

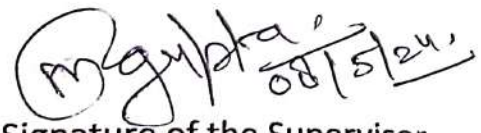
CANDIDATE'S DECLARATION

I hereby certify that the project being presented entitled **" SUMMING THROUGH RAMANUJAN'S WAY, BERNOULLI NUMBERS AND ZETA FUNCTIONS "** in partial fulfilment for the award of the degree of B.Sc. - mathematics submitted to the department of mathematics , GGV , Bilaspur, C.G., India is an authentic record of my work carried out during the period of Bsc VI semester from Feb to may 2024 under supervision of **Dr. M.K. Gupta.** The matter presented in this project has not been submitted by me or any-body else in any other institute for the award of any degree.

Signature of Student

ABHAY INGLEY

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.



Signature of the Supervisor

Dr. M. K. Gupta

(Assistant Professor)

Department of Mathematics (GGV)

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AN INTRODUCTION TO CRYPTOGRAPHY

Submitted by

ANAMIKA BANJARE

Bsc Mathematics, 6th sem

Enroll No – GGV/21/05507

Roll Number- 21074107

Under the supervision of

DR. D. GOPAL

DEPARTMENT OF MATHEMATICS

Guru Ghasidas Vishwavidyalaya (A Central University) Bilaspur,

Chhattisgarh, India

MAY 2024

CANDIDATE'S DECLARATION

I hereby certify that the work which is being presented in the project entitled "**AN INTRODUCTION TO CRYPTOGRAPHY**" in partial fulfillment for the award of the degree of BSC Mathematics submitted to the Department of Mathematics Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur, Chhattisgarh, India is an authentic record of my work carried out during the period from February to May 2024 under supervision of **Dr. D. Gopal**. The matter presented in this project has not been submitted by me or anybody else in any other university /institute for the award of any degree/diploma.

Signature of student
ANAMIKA BANJARE

This is to certify that the above statement made by the candidate is correct to the best of our knowledge.

Signature of the supervisor
Dr. D. Gopal -.....

ABSTRACT

Cryptography, the science of secure communication, plays a pivotal role in safeguarding sensitive information in the digital age. This introductory exploration delves into the fundamental principles, techniques, and applications of cryptography. Beginning with an overview of its historical roots, tracing back to ancient times when Caesar used substitution ciphers to protect military communications, the abstract progresses to the modern era where sophisticated algorithms and mathematical concepts form the backbone of cryptographic systems.

The abstract outlines the core objectives of cryptography: confidentiality, integrity, authentication, and non-repudiation. It explores the concept of encryption, the process of converting plaintext into cipher text using cryptographic algorithms, and the significance of cryptographic keys in ensuring confidentiality. Additionally, it discusses cryptographic hashing, a technique vital for verifying data integrity and creating digital signatures.

Furthermore, the abstract elucidates various cryptographic protocols and algorithms, ranging from symmetric key encryption like AES (Advanced Encryption Standard) to asymmetric key encryption exemplified by RSA (Rivest-Shamir-Adleman). It also touches upon cryptographic hash functions such as SHA-256 and cryptographic protocols like SSL/TLS used for secure communication over the internet.

Lastly, the abstract underscores the pervasive role of cryptography in modern society, influencing realms as diverse as cybersecurity, financial transactions, privacy preservation, and decentralized technologies like blockchain. By providing a foundational understanding of cryptography, this introduction seeks to empower individuals with the knowledge to navigate the intricacies of secure communication in an increasingly interconnected world.

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA , BILASPUR(C.G.)

(A Central University established by the Central Universities Act 2009 No. 25 of 2009, Bilaspur, C.G.)

(Session 2023-2024)

PROJECT ON

"FRACTIONAL CALCULUS"

Submitted in partial fulfillment of the requirements for the award of the degree of B.Sc

"Bachelor of Science in Mathematics(Honors)"

Submitted By:

KUMKUM JAIN

Roll No. – 21074138

Enrollment No. – GGV/21/05538

B.Sc. 6th Semester

UNDER THE GUIDANCE OF:

Dr. Santosh Verma

(Assistant Professor of Department of Mathematics)

Guru Ghasidas Central University, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University established by the Central Universities Act 2009 No. 25 of 2009, Bilaspur, C.G.)

CERTIFICATE BY THE GUIDE

This is to certify that Kumkum Jain student of Bachelor of Science in Mathematics Honours (6th Semester, Enrollment No. GGV/21/05538), Department of Mathematics, Guru Ghasidas Central University Bilaspur (C.G.) has successfully completed her project entitled "FRACTIONAL CALCULUS" under my guidance and supervision for the award of the Degree of Bachelor of Science in Mathematics (Hons.).

This project is original, as it has not previously formed the basis for the award of any other degree.

08/05/2024

(Signature of the Guide)
Dr. Santosh Verma
Assistant Professor
(Department of Mathematics)

TABLE OF CONTENTS

GURU GHASIDAS VISHWAVIDYALAYA

DEPARTMENT OF MATHEMATICS

(HONS): 6th SEMESTER

DISSERTATION

TOPIC- *Exploring the Taylor's Theorem: A Comprehensive Study*

SUBMITTED TO:

DR. BRIJENDRA PASWAN

MATHEMATICS DEPARTMENT

G.G.V BILASPUR

SUBMITTED BY:

JAGRITI MOLCHETLA

B.SC.mathematics(Hons)

6th semester

ENROLL.NO:GGV/21/05527

ROLL NO:21074127

CERTIFICATE

I, **Jagriti Molchetla** would like to express my heartfelt gratitude and appreciation for the opportunity to undertake my Dissertation project titled ***"TAYLOR'S THEOREM "***. It is with great pleasure that I present this certificate to acknowledge the successful completion of my thesis project.

I would like to extend my sincere thanks to my supervisor, **Dr. Brijendra Paswan**, for their invaluable guidance, support, and expertise throughout this journey. Their mentorship and constructive feedback have played a crucial role in shaping the outcome of my research.

I would also like to express my gratitude to the faculty members of **"Department of Mathematics"** for their continuous encouragement, inspiration, and academic guidance. Their knowledge and expertise in the field have been instrumental in broadening my understanding and enhancing the quality of my work.

Jagriti

Submitted by

Jagriti Molchetla

6th semester (3rd year)

Department- Mathematics (Hons.)

Enrollment no: GGV/21/05527

08.5.2024

Dr B. Paswan

(Assistant Professor)

ABSTRACT

Taylor's theorem states that any sufficiently smooth function can be approximated by a polynomial near a given point. Formally, it asserts that a function f(x) can be expressed as an infinite series of polynomial terms, centered at a chosen point, with coefficients determined by the function's derivatives at that point. This theorem provides a powerful tool for approximating complex functions with simpler ones, facilitating analysis and computation in various fields such as calculus, numerical analysis, and physics. By capturing local behavior through polynomial approximation, Taylor's theorem enables precise predictions and computations in a wide range of mathematical and scientific applications

C++ progarmming

Dissertation Report Submitted For The Partical Fulfillment

Of The Degree Of

BACHELOR OF SCIENCE IN MATHS

By

KANISHK WARE

ROLL NO. 21074129

2023-24

Under The Supervision Of

DR. A.S.Ranadive

ASSISTANT PROFESSOR

GURU GHASIDAS VISHWAVIDYALAYA

BILASPUR –495009 (C.G)

DEPARTMENT OF MATH
GURU GHASIDAS VISHWAVIDYAIAYA
BILASPUR –495009 (C.G)
(A Central University Established By The Act Of Parliament 2009 NO. 25 Of 2009)

CERTIFICATE

This is to certify that the project report entitled (C++) is an authentic record of work done by KANISHK WARE, Student of B.Sc. math VI Semester of Guru Ghasidas Vishwavidyalaya , Bilaspur (C.G)

Date:
Place: Bilaspur

SIGNATURE OF GUIDE
DR.A.S.Ranadive
ASSISTANT PROFESSOR
GURU GHASIDAS VISHWAIDYALAYA
BILASPUR __495009 (C.G)

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NUMERICAL METHODS FOR SOLVING ALGEBRAIC AND TRANSCENDENTAL EQUATIONS

Dissertation is submitted to the
Guru Ghasidas Central University
For the partial fulfilment of the award of the degree of
Bachelor of science honours mathematics

By

Name - HITANSH TIWARI

Roll No. - 21074126

Enrollment No.- GGV/21/05526

Under the supervision of

Dr. J. P. Jaiswal

Associate professor

Department of mathematics

Guru Ghasidas Vishwavidyalaya (GGV)
Koni Bilaspur - 495009 Chhattisgarh
www.ggu.ac.in

CERTIFICATE

This is to certify that the work contained in the dissertation entitled **"NUMERICAL METHODS FOR SOLVING LINEAR AND TRANSIDENTAL EQUATIONS "**, submitted by **Hitansh Tiwari (Enrollment No. GGV/21/05526)** for the award of the degree of **Bachelor of Science Honours mathematics** to the Guru Ghasidas University University, Bilaspur, is a record of bonafide works carried out by him under my direct supervision and guidance.

I considered that the dissertation has reached the standards and fulfilling the requirements of the rules and regulations relating to the nature of the degree.

Date: 08/05/2024
Place: Bilaspur

08/05/2024

Signature of Supervisor
(Dr. J.P. Jaiswal)
Associate professor
Department of mathematics

CONTENT

"2-Metric Space"

A

Dissertation submitted to

Guru Ghasidas Vishwavidyalaya, Bilaspur

In the Partial fulfillment of the requirement for the award of the Degree of

Bachelor of Science

In

Mathematics

Submitted by:

Mohan Kumar Dewangan

B.sc Mathematics 6th sem

Roll no.: 21074143

Under the Guidance of

Mr. Chandra Prakash Dhuri Sir

Department of Pure and Applied Mathematics

Guru Ghasidas Vishwavidyalaya

Department of Pure and Applied Mathematics
Guru Ghasidas Vishwavidyalaya
Koni, Bilaspur (C.G.)

CERTIFICATE

This is to certify that the dissertation titled **"2-METRIC SPACE"** submitted by **MOHAN KUMAR DEWANGAN** (Roll no.: 21074143) is record of original and independent study carried out under my guidance. This report prepared by his original and has formed a basis for the award of any other Degree/Diploma by **GURU GHASIDAS Vishwavidyalaya** or any other university.

Date : 09/05/2024

Mr. Chandra Prakash Dhuri Sir
Department of Mathematics
Guru Ghasidas University

INTRODUCTION

The concept of fixed point theory and contraction mapping was extended and elaborated with the introduction of Contraction principle by Banach Concept of 2-metric space was introduced by Gahler having the area of triangle in R 2 as the inspirative example. It has been shown by Gahler that in 2-metric d is non-negative. After Gahler there was a flood of new results obtained by many authors in these spaces Military applications of fixed point theory in .2-metric spaces can be found, as well as applications in Medicine and Economics .

Then Naidu and Prasad introduced the concept of weakly commuting pairs of self-mapping on a 2-metric space, then others have proved several common fixed point theorem by using these concept.

In this paper I proved a fixed point theorem in 2-metric space by using Nesic type contractive definition and the result of Lohani and Badshah also we shall use the Lemma of Singh

GURU GHASIDAS
VISHWAVIDYALAYA

2023-24

DISSERTATION

Under guide

K.N.V.V.V PRASAD

A SUBMITTED BY
SIDDHANT CHANDRA
ENROLLMENT NO.- GGV/21/05560
ROLL NO.- 21074160
DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University established by the Central Universities Act 2009
No. 25 of 2009, Bilaspur, C.G.)

CERTIFICATE OF APPROVAL

This is to certify that Mr. SIDDHANT CHANDRA of B.Sc. 6th semester at Department of Mathematics of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) bearing Roll no. 21074160,Enrollment no. GGV/21/05560 has developed project work entitled "VEDIC MATHEMATICS IN TRIGONOMETRY " is hereby approved as a credible work for the award of the degree of Bachelor of Science in MATHEMATICS (Hons.).

DR. K N.V.V.V PRASAD

Department of Mathematics GGV, Bilaspur (C.G.)

VEDIC MATHEMATICS IN TRIGONOMETRY

TABLE OF CONTENT

Project

on

Application of Laplace Transform

A project report submitted in the partial fulfilment of the requirement for the award of the degree of

B.Sc. Mathematics Honours

BY

SIMRAN LAHARE

Enrolment No: GGV/21/05561

Roll No: 21074161

UNDER THE SUPERVISION OF

Dr KOTI N.V.V. VARA PRASAD

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

CHHATTISGARH - 495009

DEPARTMENT OF MATHEMATICS GURU GHASIDAS VISHWAVIDYALAYA BILASPUR (C.G) – 495009

CERTIFICATE

This is to certify that the work described in the project entitled **"Application of Laplace Transform"** submitted by **Simran Lahare** student of 3^{rd} year in B.sc Mathematics at Department of Mathematics, **Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)** has been successfully completed his project under the guidance of **Dr KOTI N.V.V. VARA PRASAD.**

To the best of my knowledge, the results embodied in this project have not been submitted to any other university or Institute for the award of any other degree.

Date: ..09/05/2024

Dr KOTI N.V.V. VARA PRASAD

Supervisor

Dr A.K. Thakur (H.O.D)

Department of Mathematics

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A PROJECT REPORT ON

"NUMERICAL ANALYSIS INTERPOLATION"

A Project dissertation submitted

in partial fulfilment of the requirement for the

degree of Bachelor of Science in Mathematics

by

SNEHA JAISWAL

RollNo-21074162

Enrollment No.GGV/21/05562

Guided by

Hapka Surendra ~~Sir~~

,Department of Mathematics ,GGV

Department of Mathematics

GURU GHASIDAS VISHWAVIDYALAYA , BILASPUR (C.G)

(A Central University Established by the central university Act 2009 No 25 of 2009)

Session2021-24

CERTIFICATE FROM THE SUPERVISOR

This is to certify that the project dissertation entitled as "NUMERICAL ANALYSIS INTERPOLATION" submitted by Sneha Jaiswal Department of Mathematics Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) for the partial fulfilment of the requirement for the degree of Bachelor of Science in Mathematics is an original work carried out by her under my supervision and guidance. To the best of my knowledge ,the matter embodiedin the project dissertation has not been submitted to any other University/ Institute for the award of any Degree or Diploma.

Date: 09/05/2024

Supervisor

Hapka Surendra

Department of Mathematics,GGV

CONTENT

PROJECT REPORT

ON

FUNDAMENTALS OF NUMBER THEORY AND EULER THEOREM

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF

BACHELOR OF MATHEMATICS

By

SURYA PRAKASH KHUTEY

Enrollment No.
(GGV/21/05567)

UNDER THE SUPERVISION
OF

Dr. Dhananjay Gopal
Associate professor

DEPARTMENT OF MATHEMATICS
SCHOOL OF MATHEMATICS & COMPUTER SCIENCE
GURU GHASIDAS VISHWAVIDYALA BILASPUR

APRIL 2024 (TERM-2021-24)

Department of Mathematics
Guru Ghasidas Vishwavidyalaya, Bilaspur, (C.G.)
(A Central University Established by the Central University Act,2009
No. 25 of 2009)

Certificate

This is to certify that SURYA PRAKASH KHUTEY (Enrollment No.- GGV/21/05567, Roll No. 21074167) has submitted his review entitled "FUNDAMENTALS OF NUMBER THEORY AND EULER THEOREM" under the supervision of Mr. Dhananjay Gopal toward partial fulfilment of degree of Bachelors of science in Mathematics.

The review is original and has not been submitted anywhere else for this or any other degree.

Dhananjay Gopal
supervisor

Prof.
Professor & head
Dr. Amarnath Kumar thakur

Contents

System of Linear Differential Equations

A Dissertation Submitted
In partial fulfillment for degree of
Bachelor of Science in Mathematics

Submitted By

Vivek Gope

Under the supervision of

Dr. Kankan Sarkar

Department of Mathematics

Guru Ghasidas Vishwavidyalaya

Koni- Bilaspur 495009 (C.G.)

2024

Guru Ghasidas Vishwavidyalaya

Koni- Bilaspur 495009 (C.G.)

(A Central University Established under Central University Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that Vivek Gope has worked for B.Sc. (Mathematics) dissertation entitled **"System of Linear Differential Equations "** under my supervision ~~for about 3 months~~ and this work has not been formed the basis for the award of any other similar title.

It represents entirely an independent work on the part of candidate.

09/05/24

Signature of Supervisor

Date: 09/5/24

Place: **Bilaspur**

~~Forwarded~~

Head of the Department

TABLE OF CONTENT

A PROJECT REPORT

On

Partial Differential Equations

Submitted for partial fulfilment of the

Requirements for the Award of the Degree of

Bachelor of mathematics

By

Name - Kiran Patel

Enrollment No. GGV/21/05534

UNDER THE SUPERVISION OF

Dr. A.K THAKUR PROFESSOR

DEPARTMENT OF Mathematics

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR
(C.G.) (Term- 2023-24)

CERTIFICATE

This is to certify that the work contained in the thesis entitled, "partial differential equations" submitted by Kiran Patel (Roll No. 21074134) for the degree of B.sc mathematics (Hons.) from Guru Ghasidas Central University, Bilaspur, is a record of Bonafede research work carried out by his under direct supervision and guidance by Dr. A.K Thakur during the Academic Year 2023-2024.To the best of my knowledge, the matter embodied in the dissertation has not been submitted to any other University/Institute for the award of Degree.

Dr. A.K. Thakur
PROFESSOR

"Unveiling the practicality and principles of partial differential equations in everyday life."

INTRODUCTION

Welcome to the world of partial differential equations! Join me as we explore how these equations impact coffee cooling, traffic flow, and more in our daily lives.

WHAT ARE PARTIAL DIFFERENTIAL EQUATIONS?

Let's break it down: Partial means the equation involves multiple variables, and differential means it relates to rates of change. Together, they describe how multiple variables change.

A

Major Project Report

On

"RAMANUJAN'S BIOGRAPHY & HIS RESEARCH WORKS "

Submitted to

GURU GHASIDAS UNIVERSITY,

BILASPUR

In partial fulfilment of requirement for the award of degree of

Bachelor of Science (Hons.)

In

Mathematics

Semester VI

By

ANJALI PARAKH

Roll.no. - 21074109

Enroll.no. - GGV/21/05509

Session - 2023-24

Under the Guidance of

Dr.K.N.V.V.VARA PRASAD

ASSISTANT PROFESSOR

गुरु घासीदास विश्वविद्यालय, बिलासपुर

Guru Ghasidas Vishwavidyalaya,
Bilaspur

A Central University established by the Central
Universities Act 2009 No. 25 of 2009

CERTIFICATE

This is to certify that this report on the project submitted is an outcome of the project work entitled "RAMANUJAN'S BIOGRAPHY And HIS RESEARCH WORKS ", carried out by the students in the

DECLARATION, is carried out under my guidance and supervision for the award of Degree in Bachelor of MATHEMATICS Honours of Guru Ghasidas Vishwavidyalaya, Bilaspur(C.G.),India.

To the best of my knowledge the report...

i)Embodies the work of the student(s) themselves,

ii)Has duly been completed,

iii) Fulfills the requirement of the Ordinance relating to the B.Sc. degree of the

University, and

iv) Is up to the desired standard for the purpose for which it is submitted.

Dr.K.N.V.V.VARA PRASAD

ASSISTANT PROFESSOR

Dr. A.K.THAKUR

Head,

Departmani Of Mathematics,

Guru Ghasidas Vishwavidyalaya,

Koni, Bilaspur(C.G.) India

ABSTRACT

This project aims to explore the life and remarkable contributions of the renowned Indian mathematician, ***Srinivasa Ramanujan****. Ramanujan's biography is a testament to his extraordinary genius and dedication to mathematics despite facing numerous challenges. His collaborative work with* ***G.H. Hardy*** *and his independent research papers revolutionised various branches of mathematics, including number theory, infinite series, and continued fractions. Through this project, we seek to delve into the profound impact of Ramanujan's work on the field of mathematics and celebrate his enduring legacy as one of the greatest mathematical minds of the 20th century.*

GURU GHASIDAS VISHWAVIDYALAYA

BILASHPUR, (C.G.)

DEPARTMENT OF MATHEMATICS

SESSION-2023-2024

A PROJECT REPORT ON

"STUDY OF COMPLEX ANALYSIS"

SUBMITTED FOR AWARD OF DEGREE OF BACHELOR OF SCIENCE IN MATHAMETICS

GUIDED BY-

DR. K.N.V.V.V. PRASAD SIR

G.G.V. BILASHPUR (C.G.)

SUBMITTED BY-

ABHAY KUMAR GUPTA

GURU GHASIDAS VISHWAVIDYALAYA BILASHPUR, (C.G.)

CERTIFICATE

This to certify that the project entitled "Study of complex analysis" submitted by Abhay Kumar Gupta in fulfillment for the award of Bachelor of Science in Mathematics Honours at Guru Ghasidas Vishwavidhlaya Bilashpur , is a record of project work carried out under my supervision.

PROF. A.K. THAKUR
Head of Mathematic Department
GGV Bilaspur (C.G.)

Dr. K.N.V.V.V. PRASAD
Mathematics Department
GGV Bilasur

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A review on

"NUMERICAL METHODS OF SOLVING ALGEBRAIC AND TRANSCEDENTAL EQUATIONS"

Submitted to

Department of Mathematics

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Submitted By

Kumari Yamini
B.Sc. VI Semester
Enrolment No. GGV/21/05537
Roll no. 21074137

Under the Supervision of

Mr. Hapka Surendra
Assistant Professor
Guru Ghasidas Vishwavidyalaya
Koni (495009) Bilaspur (C.G.)

Department of Mathematics
Guru Ghasidas Vishwavidyalaya, Bilaspur, (C.G.)
(A Central University Established by the Central University Act,2009
No. 25 of 2009)

Certificate

This is to certify that Kumari Yamini (Enrollment No.- GGV/21/05537, Roll No. 21074137) has submitted his review entitled **"Numerical methos of solving algebraic and transcendental Equations"** under the supervision of **Mr. Hapka Surendra** toward partial fulfillment of degree of Bachelors of science in Mathematics.

The review is original and has not been submitted anywhere else for this or any other degree.

Date: 08/05/2024
Place: Bilaspur

Mr. Hapka Surendra Sir
Supervisor
Assistant Professor

Prof. Dr. Amarnath Kumar Thakur
Professor & Head

Contents

ABSTRACT:

This paper presents an investigation into numerical methods for solving both algebraic and transcendental equations. The study focuses on comparing and evaluating various techniques, including bisection, Newton-Raphson, and secant methods, in terms of their accuracy, efficiency, and applicability across different types of equations. Additionally, the paper explores the implementation of these methods in computational environments and discusses their limitations and potential improvements. The findings offer insights into selecting the most suitable numerical method for different types of equations and provide recommendations for practical applications in engineering, physics, and other fields.

A PROJECT REPORT

ON

"INTRODUCTION TO GROUP THEORY"

Submitted for partial fulfillment of the Requirements for the Award of the Degree of

Bachelor of Science(Mathematics)

By Khushi Patel
Enrollment No. (GGV/21/05533)

UNDER THE SUPERVISION OF
Dr. Uma Devi Patel

DEPARTMENT OF MATHEMATICS
SCHOOL OF STUDIES OF MATHEMATICAL
AND COMPUTATIONAL SCIENCE
GURU GHASIDAS VISHWAVIDYALAYA
BILASPUR (C.G.)

SUPERVISOR'S CERTIFICATE

This is to certify that Khushi Patel (Enrollment No. GGV/21/05533) has completed her project entitled "INTRODUCTION TO GROUP THEORY" under my guidance and supervision. To the best of my knowledge it is her original work and is fit for evaluation for the B.Sc. Project.

Dr. Uma Devi Patel
Assistant Professor
Department of Mathematic
Guru Ghasidas Vishwavidyalaya, Bilaspur

Content

A Project Report

on

COMMON FIXED POINT THEOREMS AND COMPARISON BETWEEN THEM.

Project Submitted in a partial fulfilment of the requirement for the degree

of

B.Sc. In MATHEMATICS

UNDER THE SUPERVISION OF:

MR. C. P. DHURI

SUBMITTED BY:

KRITIKA MISHRA

B.Sc. 6th sem

Roll no- 21074135

Enrollment no- GGV/21/05535

DEPARTMENT OF MATHEMATICS
GURU GHASIDAS VISHWAVIDYALAYA
BILASPUR (C.G), INDIA

CERTIFICATE

This is to certify that the project entitled **STUDY OF COMMON FIXED POINT THEOREMS AND COMPARISON BETWEEN THEM** submitted by **KRITIKA MISHRA** in the partial fulfilment for the requirements for the award of Bachelor's of Science Degree in Mathematics at department of Mathematics, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) is an authentic work carried out by her under my supervision and guidance.

Date : 8th May, 2024

Supervisor

Mr. C. P. Dhuri

Department of Mathematics

Dr. A.K. Thakur

(Head of Deptt.)

Department of Mathematics

CONTENTS

DESERTATION REPORT

ON

MICROPROCESSOR DESIGN

Submitted for the

Partial fulfilment of the requirement for the award of Degree

of B.Sc Mathematics(Hons.)

MICROPROCESSOR 8085

SUBMITTED BY:

AYUSH RATHORE

ROLL NO.

21074119

GGV/21/05519

2023-24

Department of Mathematics

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C. G.) 495009

(A Central University established by the Central Universities Act, 2009)

DEPARTMENT OF MATHEMATICS
GURU GHASIDAS
VISHWAVIDYALAYA
BILASPUR(C.G)-495009

CERTIFICATE

This is to certify that the work described in the project entitled **Microprocessor Design** submitted by **Ayush Rathore** student of 3rd year in B.SC. Mathematics at Department of Mathematics, **Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)** has successfully completed his project under the guidance of

Proff. A.S.Ranadive

To the best of my Knowledge the results embodied in this project report have not been submitted to any other university or Institute for the award of any other degree.

Date : .....

.....

Proff. A.S.Ranadive

Supervisor

Content

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

"FIXED POINT THEOREM AND ITS APPLICATION"

A project submitted in a partial fulfilment of the requirements for the degree of

BACHELOR OF SCIENCE in MATHEMATICS (HONOURS) 2023-24

By

RUPENDRA JAGAT

B.Sc. Mathematics 6th Semester

Enroll. No. : GGV/21/05556

Roll No. : 21074156

Under Guidance Of

Dr. Koti N.V.V. Vara Prasad

Assistant Professor

Guru Ghasidas Vishwavidyalaya Bilaspur

DEPARTMENT OF PURE AND APPLIED MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR (C.G.)

(Central University Established by the Central University Act 2009 No. 25 of 2009)

CERTIFICATE

This is to certify that the work described in the project entitled "Fixed Point Theorem" submitted by **Rupendra Jagat** student of 3rd year in B.Sc. Mathematics at Department of Mathematics, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) has successfully completed his project under the guidance of **Dr. Koti N.V.V.Vara Prasad**.

To the best of my knowledge , the results embodied in this project report have not been submitted to any other university or Institute for the award of any other degree.

Date: 08/05/2024

.....

Dr. Koti N. V. V. Vara Prasad

ABSTRACT

Fixed point theorems are essential mathematical tools with a broad range of applications in numerous fields. The theoretical foundations of fixed point theorems are investigated in this research, with particular emphasis on variants, proofs, Banach's Contraction Principle.

Moreover, the project delves into the diverse applications of fixed point theorems in fields including economics, computer science, physics, and engineering. These applications demonstrate the utility and versatility of fixed point theorems in modelling dynamic systems, analyzing equilibrium states, and solving optimization problems.

Additionally, the project explores the various domains in which fixed point theorems are applied, such as engineering and economics. These uses illustrate the flexibility and usefulness of fixed point theorems in the analysis of equilibrium states, modeling of dynamic systems, and resolution of optimization issues.

A project report

On

SURVEY ON GENERALIZATIONS OF KANNAN CONTRACTION AND ITS APPLICATIONS

Submitted to the

DEPARTMENT OF MATHEMATICS ,

GURU GHASIDAS VISHWAVIDYALAYA

As a partial fulfilment of the requirements

For the B.Sc Degree

PROJECT GUIDE :

Mr. CP DHURI

(Assistant Professor)

Signature :

SUBMITTED BY :

MANISHA YADAV

21074139

B.Sc , VI Semester

Signature :

CERTIFICATE

This is to certify that the project entitled **SURVEY ON GENERALIZATIONSOF KANNAN CONTRACTION AND ITS APPLICATION** is submitted by **MANISHA YADAV** in the partial fulfilment for the requirement for the bachelor's degree in mathematics at department of mathematics, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) is authentic work carried out by her under my guidance and supervision.

Date : 8 may 2024

Project Guide

Mr. C.P. Dhuri

(Assistant Professor)

Department of mathematics

Dr. A.K. Thakur

(Head of department)

Department of mathematics

CONTENT

A review on

"Polynomial Interpolation"

Submitted to

Department of Mathematics

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Submitted By

Anjali Patel
B.Sc. VI Semester
Enrolment No. GGV/21/05510
Roll no. 21074110

Under the Supervision of

Mr. Hapka Surendra
Assistant Professor
Guru Ghasidas Vishwavidyalaya
Koni (495009) Bilaspur (C.G.)

Department of Mathematics
Guru Ghasidas Vishwavidyalaya, Bilaspur, (C.G.)
(A Central University Established by the Central University Act,2009
No. 25 of 2009)

Certificate

This is to certify that Anjali Patel (Enrollment No.- GGV/21/05510, Roll No. 21074110) has submitted his review entitled **"Polynomial Interpolation"** under the supervision of **Mr. Hapka Surendra** Sir toward partial fulfillment of degree of Bachelors of science in Mathematics.

The review is original and has not been submitted anywhere else for this or any other degree.

Date: 09/05/2024
Place: Bilaspur

Mr. Hapka Surendra
Supervisor
Assistant Professor

Prof.
Professor & Head
Dr. Amarnath Kumar Thakur

Contents

"CONTINUED FRACTION"

A

Dissertation submitted to

Guru Ghasidas Vishwavidyalaya, Bilaspur

In the Partial fulfillment of the requirement for the award of the Degree of

Bachleor of Science

In

Mathematics

Submitted by:

POOJA SAHU

B.sc Mathematics 6th sem

Roll no.: 21074150

Under the Guidance of

Dr.Dhananjaya Gopal Sir

Department of Pure and Applied Mathematics

Guru Ghasidas Vishwavidyalaya

Koni, Bilaspur (C.G.)

Guru Ghasidas VISHWAVIDYALAYA
Koni, Bilaspur (C.G.)

CERTIFICATE

This is to certify that the dissertation titled "**CONTINUED FRACTION**" submitted by **POOJA SAHU** (Roll no.: 21074150) is record of original and independent study carried out under my guidance.
This report prepared by his original and has formed a basis for the award of any other Degree/Diploma by **GURU GHASIDAS VISHWAVIDYALAYA** or any other university.

Date : 09/05/2024

Dr. Dhananjaya Gopal sir
Department of Mathematics
Guru Ghasidas Vishwavidyalaya

INDEX

PLANE WAVE PROPAGATION IN MICROPOLAR MATERIAL

A

Project Report Submitted

In partial fulfillment for the degree of

BACHELOR OF SCIENCE IN MATHEMATICS

By

KUMAR DEV

Roll no: 21074136

Registration no: GGV/21/05536

SESSION: 2021-2024

Under the guidance Of **Dr. BIJENDRA PASWAN**

Department of Pure and Applied MATHEMATICS

GURUGHASIDAS VISHWAVIDYALAYA BILASPUR (C.G.),

INDIA

Certificate from the Supervisor

This is to certify that the report entitled "WAVE PROPAGATION IN MICROPOLAR MATERIAL" carried out by Mr. Kumar Dev, of Department of Pure and Applied Mathematics, Bilaspur, for the partial fulfillment of the requirements for the degree of BACHELOR OF SCIENCE IN MATHEMATICS, GGV, Bilaspur, is absolutely carried out by her under my supervision and guidance.

To the best of our knowledge, these results have not been submitted by her for the award of any other degree or diploma.

09/05/2024

Dr. BIJENDRA PASWAN
Department of Pure and Applied Mathematics
GURUGHASIDAS VISHWAVIDYALAYA
Bilaspur (C.G.), 495009,INDIA

Abstract:

This report investigates the behavior of wave propagation in micropolar materials, a class of materials characterized by their microstructure and the presence of rotational inertia. Micropolar materials exhibit unique mechanical properties due to the additional degrees of freedom introduced by microstructural elements. In this study, we explore the theoretical framework governing wave propagation in micropolar materials, including the formulation of governing equations and the analysis of dispersion relations. The influence of material parameters, such as microinertia and micropolar coupling coefficients, on wave characteristics is examined through numerical simulations and analytical solutions. Additionally, the report discusses practical implications for engineering applications, such as the design of novel materials with tailored wave propagation properties for vibration control and waveguiding purposes. Overall, this report provides valuable insights into the understanding and manipulation of wave behavior in micropolar materials, contributing to advancements in material science and engineering.

"Magic Square"

A

Dissertation submitted to
Guru Ghasidas Vishwavidyalaya, Bilaspur

In the Partial fulfillment of the requirement for the award of the Degree of

Bachelor of Science
In
Mathematics

Submitted by:
Aman Gupta
B.sc Mathematics 6th sem
Roll no.: 21074105

Under the Guidance of
Dr. Manish Kumar Gupta Sir

Department of Pure and Applied Mathematics
Guru Ghasidas Vishwavidyalaya
Koni, Bilaspur (C.G.)

Department of Pure and Applied Mathematics
Guru Ghasidas Vishwavidyalaya
Koni, Bilaspur (C.G.)

CERTIFICATE

This is to certify that the dissertation titled "**MAGIC SQUARE**" submitted by **AMAN GUPTA** (Roll no.: 21074105) is record of original and independent study carried out under my guidance.

This report prepared by his original and has formed a basis for the award of any other Degree/Diploma by **GURU GHASIDAS VISHWAVIDYALAYA** or any other university.

09/5/24

Date : 08/05/2024

Dr. Manish Kumar Gupta Sir
Department of Mathematics
Guru Ghasidas Vishwavidyalaya

CONTENT

A PROJECT REPORT

ON

PARTIAL DIFFERENTIAL EQUATION

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF

BACHELOR OF MATHEMATICS

By

PEEYUSH PATEL

Enrollment No.
(GGV/21/05548)

UNDER THE
SUPERVISION OF

Dr. A.K.THAKUR
Professor

DEPARTMENT OF MATHEMATICS
SCHOOL OF MATHEMATICS & COMPUTER SCIENCE
GURUGHASI DAS VISHWAVIDYALA BILASPUR

(C.G) APRIL 2024 (TERM-2021-24)

ABSTRACT

Partial Differential Equations (PDEs) serve as powerful tools in modeling and understanding a myriad of phenomena across various scientific disciplines. This report delves into the fundamental concepts of PDEs, exploring their applications, solutions, and significance in the realm of mathematics, physics, engineering, and beyond.

The abstract begins by defining PDEs and highlighting their importance in describing complex physical phenomena such as heat transfer, fluid dynamics, and wave propagation. It emphasizes the versatility of PDEs in representing systems with multiple variables and their partial derivatives, making them indispensable in modeling real-world scenarios.

Next, the report discusses various solution techniques for PDEs, including analytical methods such as separation of variables, eigenfunction expansions, and integral transforms, as well as numerical methods like finite difference, finite element, and spectral methods. It underscores the importance of choosing the appropriate method based on the specific problem at hand and computational resources available.

"Magic Square"

A

Dissertation submitted to
Guru Ghasidas Vishwavidyalaya, Bilaspur

In the Partial fulfillment of the requirement for the award of the Degree of

Bachelor of Science
In
Mathematics

Submitted by:
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Department of Pure and Applied Mathematics
Guru Ghasidas Vishwavidyalaya
Koni, Bilaspur (C.G.)

CERTIFICATE

This is to certify that the dissertation titled "**MAGIC SQUARE**" submitted by **AMAN GUPTA** (Roll no.: 21074105) is record of original and independent study carried out under my guidance.

This report prepared by his original and has formed a basis for the award of any other Degree/Diploma by **GURU GHASIDAS VISHWAVIDYALAYA** or any other university.

09/5/24

Date : 08/05/2024

Dr. Manish Kumar Gupta Sir
Department of Mathematics
Guru Ghasidas Vishwavidyalaya

CONTENT

"2-Metric Space"

A

Dissertation submitted to

Guru Ghasidas Vishwavidyalaya, Bilaspur

In the Partial fulfillment of the requirement for the award of the Degree

of

Bachelor of Science

In

Mathematics

Submitted by:

Mohan Kumar Dewangan

B.sc Mathematics 6th sem

Roll no.: 21074143

Under the Guidance of

Mr. Chandra Prakash Dhuri Sir

Department of Pure and Applied Mathematics

Guru Ghasidas Vishwavidyalaya

Department of Pure and Applied Mathematics
Guru Ghasidas Vishwavidyalaya
Koni, Bilaspur (C.G.)

CERTIFICATE

This is to certify that the dissertation titled "**2-METRIC SPACE**" submitted by **MOHAN KUMAR DEWANGAN** (Roll no.: 21074143) is record of original and independent study carried out under my guidance. This report prepared by his original and has formed a basis for the award of any other Degree/Diploma by **GURU GHASIDAS Vishwavidyalaya** or any other university.

Date : 09/05/2024

Mr. Chandra Prakash Dhuri Sir
Department of Mathematics
Guru Ghasidas University

"SOME APPLICATION OF ENRICHED NONEXPANSIVE MAPPING"

A

Dissertation submitted to
Guru Ghasidas Vishwavidyalaya, Bilaspur

In the Partial fulfillment of the requirement for the award of the Degree of

Bachelor of Science

In

Mathematics

Submitted by:
Nikita Verma

Under the Guidance of
Mr.Chandra Prakash Dhuri

B.sc Mathematics 6th sem
Roll no.: 21074146

Department of Pure and Applied Mathematics

Koni, Bilaspur,C.G

CERTIFICATE

This is to certify that the dissertation titled " **Some Applications of Enriched Nonexpansive mapping"** submitted by **Nikita Verma** (Roll no.: 21074146) is record of original and independent study carried out under my guidance.

This report prepared by his original and has formed a basis for the award of any other Degree/Diploma by **GURU GHASIDAS VISHWAVIDYALAYA** or any other University .

Date : 09/05/2024

Mr. Chandra Prakash Dhuri

Department of Pure and Applied mathematics
Guru Ghasidas Vishwavidyalaya
Koni,Bilaspur(C.g)

Contents

- φ-Contraction
- Enriched ϕ Contraction
- Enriched contraction

3) Application of Fixed Point Theory
- Enriched Nonexpansive
- Enriched ϕ Contraction

4)Conclusion

5) Bibliography

NUMERICAL SOLUTIONS OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS

A

Project Report Submitted

In partial fulfillment for the degree of

BACHELOR OF SCIENCE IN MATHEMATICS

By

MEGHA VERMA

Roll no: 21074141

Registration no: GGV/21/05541

SESSION: 2021-2024

Under the guidance Of

Dr. UMA DEVI PATEL

Department of Pure and Applied Mathematics

GURU GHASIDAS VISHWAVIDYALAYA

BILASPUR- 495009 (C.G.), INDIA

CERTIFICATE

This is to certify that the report entitled "**NUMERICAL SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATION** " carried out by **MEGHA VERMA**, of Department of Pure and Applied Mathematics, Bilaspur, for the partial fulfillment of the requirements for the degree of BACHELOR OF SCIENCE IN MATHEMATICS, at GGV, Bilaspur, is absolutely carried out by his under my supervision and guidance.

To the best of our knowledge, these have not been submitted by her for the award of any other degree or diploma.

Dr. UMA DEVI PATEL

Department of Pure and Applied Mathematics

GURU GHASIDAS VISHWAVIDYALAYA

Bilaspur (C.G.), 495009, INDIA

CONTENT

A PROJECT REPORT ON

"HISTORY OF INDIAN MATHEMATICS "

A Project dissertation submitted

in partial fulfilment of the requirement for the

degree ofBachelor of Science in

MATHEMATICS by

ANURAG SAHU

Roll No - 21074112

Enrollment No. GGV/21/05512

Guided by

Dr. B.B. Chaturvedi

Asst. professor, Department of mathematics, GGV

Department of Mathematics

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G)

(A Central University Established by the central university Act 2009 No 25 of 2009)

Session 2021-24

CERTIFICATE FROM THE SUPERVISOR

This is to certify that the project dissertation entitled as "History of Indian Mathematics " submitted by Anurag Sahu Department of Mathematics, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) for the partial fulfilment of the requirement for the degree of Bachelor of Science in Mathematics is an original work carried out by her under my supervision and guidance. To the best of my knowledge, the matter embodied in the project dissertation has not beensubmitted to any other University/ Institute for the award of any Degree or Diploma.

Date:

BBChaub
08/05/24

Supervisor

Dr. B.B. Chaturvedi

Department of Mathematics.

CONTENT

A

PROJECT ON

"Chinese Remainder Theorem"

Submitted In Partial Fulfilment Of The Requirements For The

Award Of The Degree Of B.Sc.

"Bachelor Of Science In Mathematics (Honors)"

Submitted By:

Nikhil Jadhav

Roll No. – 21074145

Enrollment No. – GGV/21/05545

UNDER THE GUIDANCE OF:

Dr. Dhananjay Gopal

(Associate Professor of Department of Mathematics)

Guru Ghasidas Central University, Bilaspur (C.G.)

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University Established by Central University Act, 2009 No 25 of 2009)

(Session 2023-24)

गुरु घासीदास विश्वविद्यालय, बिलासपुर
Guru Ghasidas Vishwavidyalaya, Bilaspur

A Central University established by the Central Universities Act 2009 (No. 25 of 2009)

CERTIFICATE OF THE GUIDE

This is to certify that Nikhil Jadhav a student of Bachelor of Science in Mathematics Honours (6th Semester, Enrollment No. GGV/21/05545), **Department of Mathematics, Guru Ghasidas Central University Bilaspur (C.G.)** has successfully completed her project entitled **"Chinese Remainder Theorem"** under my guidance and supervision for the award of the Degree of **Bachelor of Science in Mathematics (Hons.)**.

This project is original, as it has not previously formed the basis for the award of any other degree.

(Signature of the Guide)

Dr. Dhananjay Gopal
Associate Professor

(Dept. of Mathematics)

CONTENTS

Project

on

Application of Laplace Transform

A project report submitted in the partial fulfilment of the requirement for the award of the degree of

B.Sc. Mathematics Honours

BY

SIMRAN LAHARE

Enrolment No: GGV/21/05561

Roll No: 21074161

UNDER THE SUPERVISION OF

Dr KOTI N.V.V. VARA PRASAD

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

CHHATTISGARH - 495009

DEPARTMENT OF MATHEMATICS GURU GHASIDAS VISHWAVIDYALAYA BILASPUR (C.G) – 495009

CERTIFICATE

This is to certify that the work described in the project entitled **"Application of Laplace Transform"** submitted by **Simran Lahare** student of 3^{rd} year in B.sc Mathematics at Department of Mathematics, **Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)** has been successfully completed his project under the guidance of **Dr KOTI N.V.V. VARA PRASAD.**

To the best of my knowledge, the results embodied in this project have not been submitted to any other university or Institute for the award of any other degree.

Date: .09/05/2024

Dr KOTI N.V.V. VARA PRASAD

Supervisor

Dr A.K. Thakur (H.O.D)

Department of Mathematics

Table of Contents

A PROJECT REPORT ON NUMERICAL ANALYSIS

Submitted To: -

Guru Ghasidas Vishwavidyalaya

In the partial fulfilment for the degree of

Bachelor of Mathematics

Submitted By: -

Shweta Tamrakar

Enrollment No. – GGV/21/05558

Roll No. – 21074158

B.SC. (Hons) [6TH Semester]

Under the Guidance of:

MR. Hapka Surendra

(Assistant Professor)

Department of Mathematics

Guru Ghasidas Vishwavidyalaya

Session 2021-24

May 9, 2024

CERTIFICATE

This is to certify that **MISS SHWETA TAMRAKAR's** project dissertation report, **"Numerical Analysis,** "is original work completed for the Bachelors of Mathematics [Hons] 6th semester and submitted to the Department of Mathematics at the Guru Ghasidas Vishwavidyalaya located at koni, Bilaspur, 495001.

Head of Department
Department of Mathematics
Guru Ghasidas Vishwavidyalaya

Mr. Hapka Surendra
Assistant professor
Department of Mathematics

TABLE OF CONTENT

PROJECT REPORT

ON

INTRODUCTION TO OPERATING SYSTEM

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTSFOR THE AWARD OF THE DEGREE OF

BACHELOR OF MATHEMATICS

By

OM CHANDRA

Enrollment No. (GGV/21/05547)

UNDER THE SUPERVISION OF

Dr.A.S. RANADIVE

DEPARTMENT OF MATHEMATICS
SCHOOL OF MATHEMATICS & COMPUTER SCIENCE
GURU GHASIDAS VISHWAVIDYALA BILASPUR (C.G)

APRIL 2024 (TERM-2021-24)

ABSTRACT

The operating system is the performance of a computer system hardware abstraction, through which people control the hardware, and to use the resources of the computer system. Course groups is proposed, using a variety of measures to uphold the theory and practice, both innovative strategies to improve teaching effectiveness, develop computer applications personnel.

In order to cultivate the students' basic knowledge, practical ability, innovation and system design capability for the subject to course through software and hardware as a method, the computer circuit basis, computer composition principle, embedded system design, operating system, compiler theory melt together five courses, top-down design course group knowledge, transfer of knowledge from the bottom up, from the inside out, from parts to whole again to the system, layers, and eventually fall into place. As a result, links between courses are strengthened, and the students' computer systems analysis and design capability and innovation is improved.

A PROJECT REPORT

on

"NUMERICAL INTEGRATION"

Submitted for partial fulfilment of the

Requirement of the Award of the Degree of

BACHELOR OF SCIENCE

By

SAVITA RATHIA

Enrollment No. (GGV/21/05557)

UNDER THE SUPERVISION OF

DR. KANKAN SARKAR

DEPARTMENT OF MATHEMATICS

SCHOOL OF STUDIES OF MATHEMATICAL & COMPUTATIONAL SCIENCE

GURU GHASIDAS VISHWAVIDYALAYA,

BILASPUR (C.G.)

APRIL 2023 (Term – 2023-24)

SUPERVISOR'S CERTIFICATE

This is to certify that Savita Rathia (Enrollment No. GGV/21/05557) has completed her project entitled **"Numerical Integration"** under my guidance and supervision. To the best of my knowledge, it is her original work and is fit for the B.SC Project.

09/05/24

Dr. Kankan Sarkar

Associate Professor,

Department of Mathematics

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CONTENTS

Project

On

NEED OF BASIC MATHEMATICS FOR DATA SCIENCE

A project report submitted in the partial fulfilment of the requirement for the award of the degree of

B.Sc. Mathematics Honours

BY

Vikalp Bhardwaj

Enrolment No: GGV/21/05568

Roll No: 21074168

UNDER THE SUPERVISION OF

Dr. P P Murthy SIR

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

CHHATTISGARH – 495009

Department Of Mathematics Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)- 495009

Certificate

This is to certify that the work described in the project entitled **"BASIC NEED OF BASIC MATHEMATICS FOR DATA SCIENCE"** submitted by **Vikalp Bhardwaj** student of 6th semester in B.sc mathematics at department of mathematics guru ghasidas Vishwavidyalaya, Bilaspur has been successfully completed his project under the guidance of mr P.P. Murthy.

To the best of my knowledge, the result embodied in the project have been submitted to any other university or institute for the award of any other degree.

Date: 9/5/2024

Dr. P.P. Murthy
(supervisor)

Dr. A.K. Thakur (H.O.D)

Table of content

A Project Report On

DATA SCIENCE AND APPLICATIONS

Department of Mathematics

Guru Ghasidas Vishawavidyalaya

Submitted by:
Sparsh Thawait
B.Sc. VI Sem. (Mathematics)
Roll no. : 21074164
Enroll no. : GGV/21/05564

Supervised by:
Dr. P.P. Murthy
Professor
Mathematics Department

DEPARTMENT OF MATHEMATICS
GURU GHASIDAS VISHWAVIDYALAYA
BILASPUR(C.G)-495009

CERTIFICATE

This is to certify that the work described in the project entitled **"Data Science and Applications"** submitted by **Sparsh Thawait** student of 3rd year in B.sc. Mathematics at Department of Mathematics, **Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)** has successfully completed his project under the guidance of **Dr. P.P. Murthy.**

To the best of my knowledge ,the results embodied in this project report have not been submitted to any other university or Institute for the award of any other degree.

Date : 9/5/2024

.....
Dr. P.P. Murthy
Supervisor

ABSTRACT

Data science is like a detective for data. It uses math, statistics, and computer science to solve mysteries in information. Imagine a huge pile of numbers, like puzzle pieces. Data scientists sort through them, finding patterns and stories. They use tools like machine learning to predict future events or understand trends. It's like peeking into the future with numbers! Data science helps businesses make smart decisions, like which products to sell or who to target with ads. It's all about turning data chaos into meaningful insights that drive success.

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University Established by Central University Act, 2009 No 25 of 2009)

http://www.ggu.ac.in

(Session 2023-2024)

A

PROJECT ON

"Factional Calculus in Medical & Health Science "

Submitted in partial fulfillment of the requirements for the

award of the degree of B.Sc.

"Bachelor of Science in Mathematics(Honors)"

Submitted by:

Vishvendra Pratap

Singh

Roll No.–21074169

Enrollment No.–GGV/21/05569

B.Sc. – 6th Semester

UNDER THE GUIDANCE OF:

Dr. Santosh [redacted] Verma

(Assistant Professor)

(Department of Mathematics)

Guru Ghasidas Vishwavidyalaya , Bilaspur (C.G.)

Guru Ghasidas Vishwavidyalaya

(A Central University established by the Central Universities Act2009 No.25 of 2009, Bilaspur, C.G.)

CERTIFICATE OF THE GUIDE

This is to certify that Vishvendra Pratap Singh student of Bachelor of Science in Mathematics Honours (6th Semester, Enrollment No. GGV/21/05569),Department of Mathematics, Guru Ghasidas Central University Bilaspur (C.G.) has successfully completed his project entitled "Fractional Calculus in Medical & Health Science"
Under my guidance and supervision for the award of the Degree of Bachelor of Science in Mathematics (Hons.).

09/05/2024

(Signature of the Guide)

Dr. Santosh [redacted] Verma
Assistant Professor
(Department of Mathematics)

TABLE OF CONTENT

GURU GHASIDAS VISHWAVIDYALAYA

DEPARTMENT OF MATHEMATICS (HONS.)

6th SEMESTER

DISSERTATION

TOPIC- Exploring the Chinese Reminder Theorem: A Comprehensive Study

---

SUBMITTED TO:

Dr. Kankan Sarkar

SUBMITTED BY:

Sonal Sonwani

B.SC.mathematics(Hons)

6th semester

ENROLMENT NO:GGV/21/05563
ROLL NO -21074163

CERTIFICATE

I certify that Miss.Sonal Sonwani dissertation titled "Exploring the chinese reminder theorem: A comprehensive study" submitted for the Bachelor of Science (Hons.) degree in Mathematics at Guru Ghasidas University, completed under my supervision during the 2023-24 session, meets the requirements for the degree. The dissertation's contents have not been previously submitted for any other degree or diploma, either at this university or elsewhere.

09/05/24

SUPERVISOR

Dr. kankan Sarkar

Submitted by

Sonal sonwani

6th semester (3rd.year)

Department- Mathematics (Hons.)

Enrolment no; - GGV/21/05563

Roll no- 21074163

CONTENTS

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR(C.G.)

A Central University established by the Central Universities Act 2009 No. 25 of 2009

(Session 2023-2024)

A PROJECT ON

INTERPOLATION

(Submitted in partial fulfillment of the requirements for the award of the degree of B.S.c)

"BACHELORS OF SCIENCE IN MATHEMATICS"

Submitted by

PRACHI VAISHNAV

Roll No. – 21074151

Enrollment no-GGV/21/005551

B.S.c – 6th Semester

UNDER THE GUIDANCE OF

Dr.J.P JAISWAL

(Associate Professor of Department of Mathematics)

(Guru Ghasidas Central University,BILaspur(C.G)

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR(C.G.)

A Central University established by the Central Universities Act 2009 No. 25 of 2009

CERTIFICATE

This is to certify that the project entitle **INTERPOLATION** submitted by **PRACHI VAISHNAV** a student of B.Sc. Mathematical Honors 6th Semester under the supervision of **Dr.J.P. JAISWAL,** Associate professor, Department of Mathematics, Guru Ghasidas Vishwavidyalaya, Bilaspur.

Date:-09/05/24

Supervisor

Dr. J.P JAISWAL

Department of Mathematics

Dr. A.K. THAKUR (Head of department)

Department of Mathematics

ABSTRACT

This article is concerned with the prediction of population growth using the logistic growth model in the case when the carrying capacity K for the population tends to infinity. A new fractional approach is introduced based on so what called "Rayleigh distribution". This approach produces a minimal error in estimation compared to the logistic growth model. In this paper, it is shown that the classical logistic model is not appropriate when the carrying capacity K tends to infinity, like for the Indian or Chinese population for instance. A fractional model that would be appropriate in such a case is proposed. And Growth models have been widely used to describe behavior in different areas of knowledge; among them the Logistics and Gompertz models, classified as models with a fixed inflection point, have been widely studied and applied. In the present work, a model is proposed that contains these growth models as extreme cases; this model is generalized by including the Caputo-type fractional derivative of order $0 < \beta < 1$, resulting in a Fractional Growth Model which could be classified as a growth model with non-fixed inflection point. Moreover, the proposed model is generalized to include multiple sigmoidal behaviors and thereby multiple inflection points.

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR(C.G.)

A Central University established by the Central Universities Act 2009 No. 25 of 2009

(Session 2023-2024)

A PROJECT ON

NUMERICAL DIFFERENTIATION AND INTEGRATION

(Submitted in partial fulfillment of the requirements for the award of the degree of B.S.c)

"BACHELORS OF SCIENCE IN MATHEMATICS"

Submitted by

MUSKAN TRIPATHI

Roll No. – 21074144

Enrollment no-GGV/21/00544

B.S.c – 6th Semester

UNDER THE GUIDANCE OF

Dr.J.P JAISWAL

(Associate Professor of Department of Mathematics)

(Guru Ghasidas Central University,BILaspur(C.G)

DEPARTMENT OF MATHEMATICS

GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR(C.G.)

A Central University established by the Central Universities Act 2009 No. 25 of 2009

CERTIFICATE

This is to certify that the project entitle **NUMERICAL DIFFERENCIATION AND INTEGRATION** submitted by **MUSKAN TRIPATHI** a student ofB.Sc. Mathematical Honors 6th Semester under the supervision of **Dr.J.P. JAISWAL,** Associate professor, Department of Mathematics, Guru Ghasidas Vishwavidyalaya, Bilaspur.

Date:-09-05-24

Supervisor

Dr. J.P JAISWAL

Department of Mathematics

Dr. A.K. THAKUR (Head of department)

Department of Mathematics

CONTENT -

PLANE WAVE PROPAGATION IN MONOCLINIC MATERIAL

A

Project Report Submitted

In partial fulfillment for the degree of

BACHELOR OF SCIENCE IN MATHEMATICS

By

VIVEK NETAM

Roll no: 21074171

Registration no: GGV/21/05571

SESSION: 2021-2024

Under the guidance

Of

Dr. BRIJENDRA PASWAN

Department of Pure and Applied MATHEMATICS

GURUGHASIDAS VISHWAVIDYALAYA BILASPUR (C.G.),

INDIA

Certificate from the Supervisor

This is to certify that the report entitled "PLANE WAVE PROPAGATION IN MONOCLINIC MATERIAL" carried out by Mr. Vivek Netam, of Department of Pure and Applied Mathematics, Bilaspur, for the partial fulfillment of the requirements for the degree of BACHELOR OF SCIENCE IN MATHEMATICS, GGV, Bilaspur, is absolutely carried out by her under my supervision and guidance.

To the best of our knowledge, these results have not been submitted by her for the award of any other degree or diploma.

Dr. BRIJENDRA PASWAN
Department of Pure and Applied Mathematics
GURUGHASIDAS VISHWAVIDYALAYA
Bilaspur (C.G.), 495009, INDIA

Abstract

This report investigates the intricate phenomenon of wave propagation within monoclinic materials, shedding light on the complex interplay of material properties and structural anisotropy. Monoclinic materials, characterized by their asymmetric crystal structures, present unique challenges and opportunities in various engineering and scientific domains. Through theoretical analysis, numerical simulations, and experimental validation, this study explores the nuanced behavior of longitudinal, transverse, and shear waves in monoclinic materials across different loading conditions and orientations. The report delves into the fundamental principles governing wave propagation, including elastic constants, symmetry considerations, and dispersion relations, elucidating the influence of material anisotropy on wave behavior. Moreover, practical implications for non-destructive testing, ultrasonic sensing, and structural health monitoring are discussed, highlighting the potential applications and limitations of monoclinic materials in advanced engineering systems. By offering a comprehensive understanding of wave propagation in monoclinic materials, this report contributes to the broader advancement of materials science and engineering, paving the way for optimized designs and enhanced performance in diverse technological endeavors.