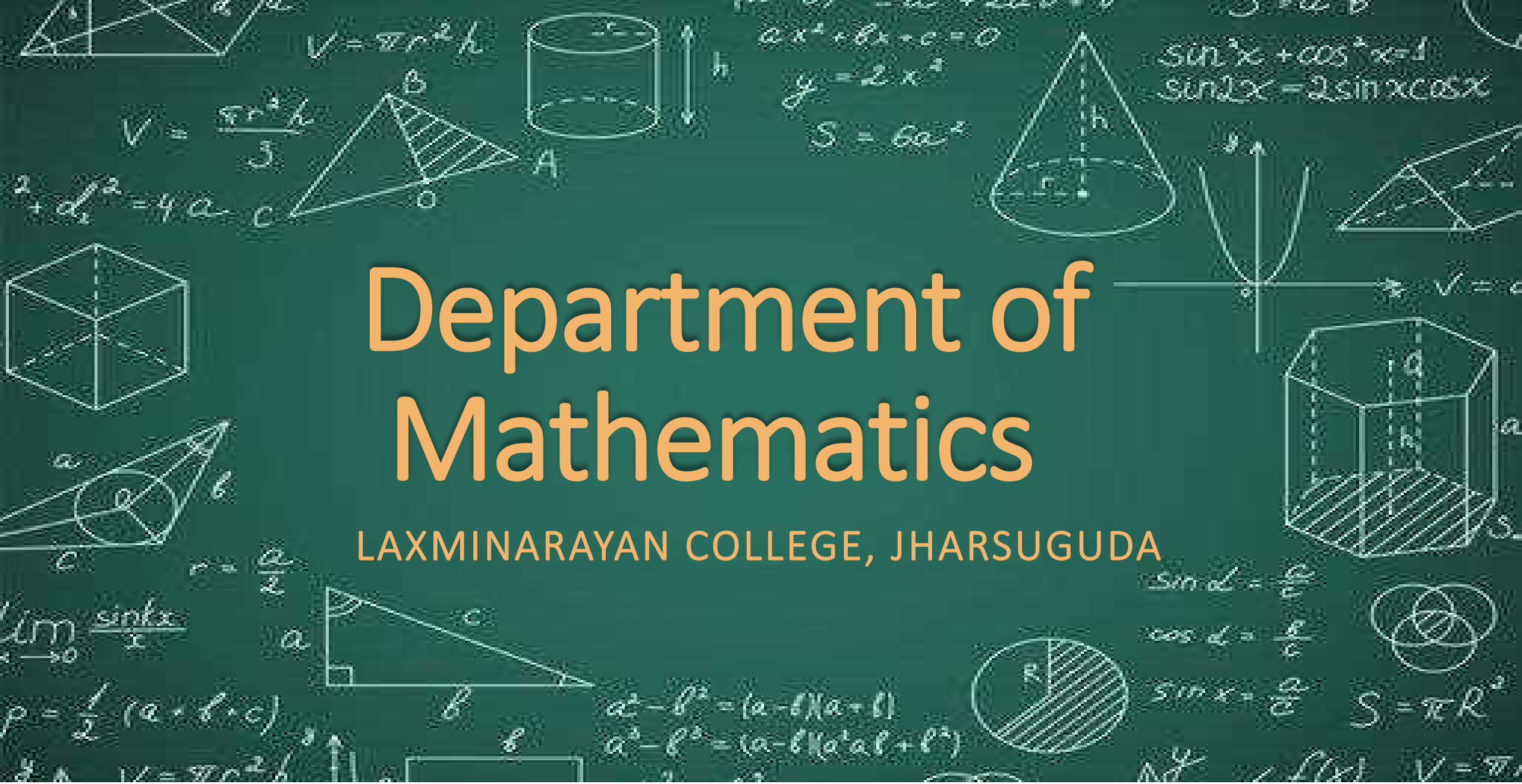
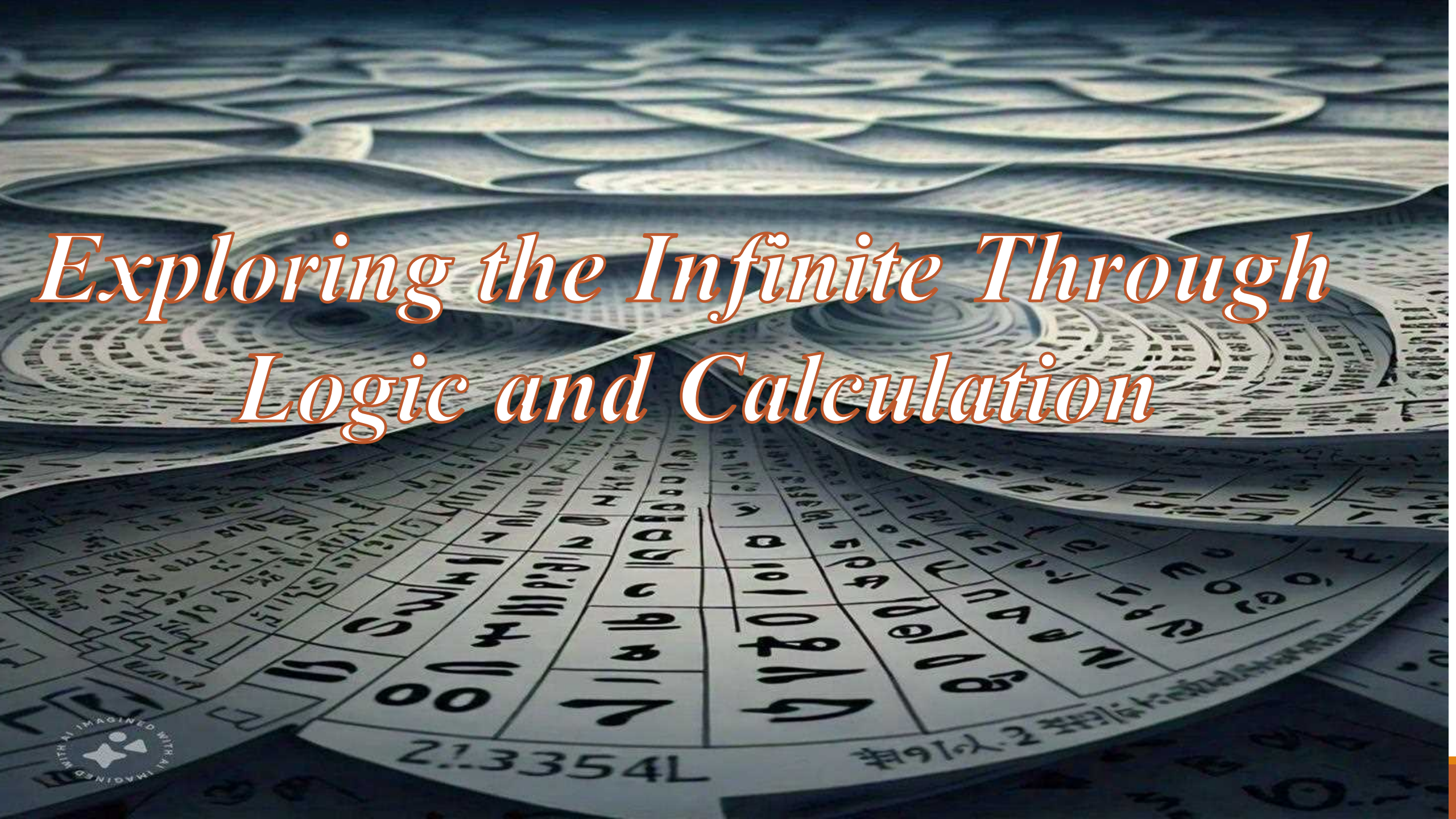


Department of Mathematics

LAXMINARAYAN COLLEGE, JHARSUGUDA


Exploring the Infinite Through
Logic and Calculation

Vision of the Department:

To be a leading center of excellence in mathematical education and research, fostering innovation, critical thinking, and interdisciplinary collaboration, while empowering students to solve complex problems and contribute to advancements in mathematics and related fields.

Mission of the Department:

- To provide a rigorous and supportive educational environment that promotes a deep understanding of mathematical principles and their applications.
- To deliver high-quality instruction and prepare our students for diverse careers by developing their analytical and problem-solving skills.
- To foster a passion for mathematics and its relevance to solve real-world challenges through innovative teaching methods.

Annual Calendar

Sl. No.	Subject		Date
1.	Commencement of Classes +3 2nd and 3rdYear		As per the college notice
2.	Commencement of Classes +3 1st Year		1st August 2024
3.	Teachers' Meeting		On the Reopening Day after Summer Vacation/ within Regular Intervals
4.	Induction of +3 1st Year Students		September/October
5.	Mentor Mentee Meetings for +3 1stYear, 2nd Year & 3rd Year		Last Saturday of Each Month
6.	Parents-Teachers Meet of +3 1st Year,2nd Year & 3rd Year		November 2024
			February 2025
7.	Mid SemesterExams	1st , 3rd & 5th Semesters	By last week of October 2024
		2nd, 4th& 6th Semesters	By first week of February 2025
	End SemesterExams	1st, 3rd& 5th Semesters	By first week of December 2024
		2nd, 4th& 6th Semesters	By last week of April 2025
8.	Departmental Seminars		Every Saturday
9.	Fibonacci Day		23rd November 2024
10.	National Mathematics Day		22nd December 2024
9.	E-day		7th February 2025
11.	Pi Day		14th March 2025
12.	World Math Day		23rd March 2025
13.	Intra department competitions		First week of December 2024

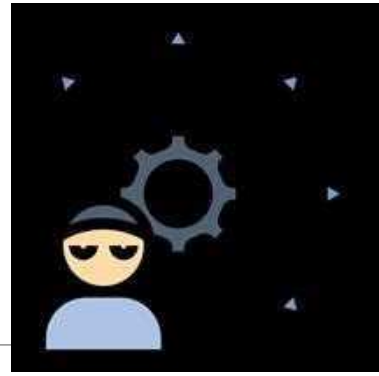
Rules and Regulations

- Students should follow the rules and regulations of the college which can be found here.
- Along with this a minimum of 75% attendance is required for appearing in the internal and university examinations.
- Students should inform and give application to the HOD/subject teacher for absence during the academic sessions.
- Students need to participate in Departmental Seminars.

Courses Offered:

- Under Graduate in Mathematics since 1969
- Post Graduate in Mathematics since 2024

Program Outcome of B.Sc. Mathematics



PO1. Articulate the methods of science and explain why current scientific knowledge is both contestable and testable by future inquiry.

PO2. Apply appropriate methods of research, investigation and design, to solve problem in science, mathematics, technology including the planning and conduct of a significant project problem or investigation.

PO3. Articulate the relationship between different science communities of practice, the international scope of science, mathematics, technology and engineering knowledge and methods and the contributions to their development that have been made by people with diverse perspectives, culture and backgrounds.

PO4. Students will express their own ideas as informed opinions, small projects, practical, research papers and understand how their own approach compares to variety of critical and theoretical approaches.

Program Specific Outcome of B.Sc. Mathematics:

PSO1. Develop deep interest in learning mathematics.

PSO2. Develop broad and balanced knowledge and understanding of definitions, concepts, principles and theorems.

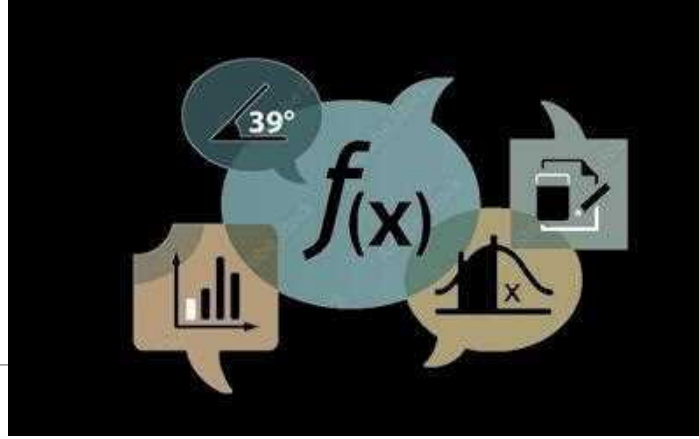
PSO3. Familiarize the students with suitable tools of mathematical analysis to handle issues and problems in mathematics and related sciences.

PSO4. Enhance the ability of learners to apply the knowledge and skills acquired by them during the programme to solve specific theoretical and applied problems in mathematics.

PSO5. Provide students with knowledge and skills enabling them to undertake further studies in mathematics and its allied areas on multiple disciplines concerned with mathematics.

PSO6. Encourage the students to develop a range of generic skills helpful in employment, internships and social activities.

Course Outcome of B.Sc. Mathematics:



The detailed course outcome of B.Sc. Mathematics can be found here.

Syllabus

- Our Institution is affiliated under Sambalpur University, Jyoti Vihar, Burla, Sambalpur, Odisha.
- The syllabus for B.Sc. Mathematics is the one approved by Sambalpur University which can be found here.
- The syllabus for M.Sc. Mathematics is the one approved by Sambalpur University which can be found here.

Faculties:

Mrs. Prajnya Parimita Patel

Miss Netrakanti Naik

Dr. Uddhaba Biswal

Mr. Sahil Rishmilya Pradhan

Mrs. Prajnya Parimita Patel

Educational Qualifications:

Graduation	Integrated B.Sc. B.Ed. with Mathematics Major	Regional Institute of Education, Bhubaneswar, Odisha-751022	2015
Post Graduation	M.Sc. in Mathematics and Computing	IIT (ISM) Dhanbad, Jharkhand-826004	2017

Courses assigned in this Session (odd Semester)

- Core-II, Introduction to Algebra and Number Theory, 1st year, 1st Semester, B.Sc. Mathematics
- Core-V, Theory of real Functions, 2nd year, 3rd Semester, B.Sc. Mathematics
- DSE-II, Probability and Statistics, 3rd Year, 5th Semester, B.Sc. Mathematics
- MAT- C -414, TOPOLOGY, 1st Year, 1st Semester, M.Sc. Mathematics

(National/ International) Seminars/ Webinars/ Workshops/ FDP/ Orientation/ Refresher/ Conferences attended:

- ✓Induction Training Program at Berhampur University, from 6th January to 19th January 2020.
- ✓International Conference on advances in Mathematics and computing-2020 at VSSUT, Burla, from 7th February to 8th February 2020.
- ✓Refresher course in Mathematics by Ramanujan College, Delhi, from 16th March to 30th March 2021.
- ✓Teacher Training/ Orientation Programme (Mathematics) at IISc Challekere Campus, Bangalore, from 19th November to 29th November 2021.
- ✓Faculty Development program on National Education Policy and its impact on Higher Education by Kalinga University on 16th December 2023.
- ✓Teacher Enrichment workshop on Partial Differential Equations by KJ Somaiya College of Science and Commerce Mumbai, from 15th January to 20th January 2024.
- ✓NEP 2020 Orientation and Sensitization Programme under MM-TTP of UGC organized by Regional Institute of Education, Mysore from 27th August to 4th September 2024.

Publication:

1. Das, Amrita, Abhishek Kumar Singh, **Prajnya Parimita Patel**, Kshitish Ch Mistri, and Amares Chattopadhyay. "Reflection and refraction of plane waves at the loosely bonded common interface of piezoelectric fibre-reinforced and fibre-reinforced composite media." Ultrasonics 94 (2019): 131-144.

Miss Netrakanti Naik

Name of the Exam/degree	Passing Year	Council/ Board/ University	Subject Details	Division/Grade
B. Sc.	2018	Rama Devi Women's University, Bhubaneswar	Mathematics Hons.	1st
M. Sc.	2020	Utkal University, Bhubaneswar	Mathematics Hons.	1st
CSIR-UGC NET(JRF)	2021	University Grant Commission	Mathematics	121(AIR)

Courses assigned in this Session (odd Semester)

- Core-I, Calculus and Analytical Geometry, 1st year, 1st Semester, B.Sc. Mathematics
- Core-VII, Partial Differential Equations and System of ODEs, 2nd year, 3rd Semester, B.Sc. Mathematics
- DSC-XI, Multivariate Calculus, 3rd Year, 5th Semester, B.Sc. Mathematics
- MAT- C -413 ALGEBRA-1, 1st Year, 1st Semester, M.Sc. Mathematics

Extra-Curricular Work Experience

- Working as +2 Associate Officer in-charge, L.N College, Jharsuguda
- Worked as admission team member of +2 section, L.N College, Jharsuguda
- Associate member in +2 Academic Bursar, L.N College Jharsuguda
- Coding of +2 CHSE answer scripts
- Working as Scholarship member of +3, L.N College, Jharsuguda

Workshop/FDP Attended

1. Online Faculty Development Programme on ‘Mastering the Art of Using I.C.T In Teaching Pedagogies’ held on 7th November 2023.

Flg Offr Dr. Uddhaba Biswal

- Educational Qualifications- Ph.D., M.SC, CSIR-JRF, GATE

Name of the Exam/degree	Passing Year	Council/ Board/ University	Subject Details	Division/Grade
B. Sc.	2014	Rajendra (Auto.) College, Balangir (Now Rajendra University)	Mathematics Hons.	1st
M. Sc.	2016	Pondicherry University	Mathematics Hons.	1st
Ph. D.	2023	National Institute of Technology, Rourkela	Computational Fluid Dynamics, Uncertainty Modelling	
CSIR-JRF	2016	CSIR-HRDG, New Delhi	Mathematics	74 (AIR)
GATE	2017	GATE	Mathematics	149 (AIR)

Courses assigned in this Session (odd Semester)

- Core-VI, Group Theory-I, 2nd year, 3rd Semester, B.Sc. Mathematics
- DSC-XII, Linear Algebra, 3rd Year, 5th Semester, B.Sc. Mathematics
- MAT- C-411 REAL ANALYSIS, 1st Year, 1st Semester, M.Sc. Mathematics
- MAT- C-412 COMPLEX ANALYSIS, 1st Year, 1st Semester, M.Sc. Mathematics

Publications

Journal Papers

1. **Biswal, U.**, Chakraverty, S. and Ojha, B. K. (2019), "Natural convection of non-Newtonian nanofluid flow between two vertical parallel plates", ***International Journal of Numerical Methods for Heat & Fluid Flow***, Vol. 29 No. 6, pp. 1984-2008. https://doi.org/10.1108/HFF-06-2018-0302.

2. **Biswal, U.**, Chakraverty, S. and Ojha, B. K., 2020. Natural convection of nanofluid flow between two vertical flat plates with imprecise parameter. ***Coupled systems mechanics***, *9*(3), pp.219-235.

3. **Biswal, U.**, Chakraverty, S., Ojha, B. K. and Hussein, A.K., (2021), "Numerical simulation of magnetohydrodynamics nanofluid flow in a semi-porous channel with a new approach in the least square method", ***International Communications in Heat and Mass Transfer***, *121*, p.105085. https://doi.org/10.1016/j.icheatmasstransfer.2020.105085.

4. **Biswal, U.**, Chakraverty, S. and Ojha, B. K., (2021), "Application of homotopy perturbation method in inverse analysis of Jeffery–Hamel flow problem", ***European Journal of Mechanics-B/Fluids***, *86*, pp.107-112. https://doi.org/10.1016/j.euromechflu.2020.12.004.

5. **Biswal, U.**, Chakraverty, S., Ojha, B. K. and Hussein, A. K., 2021. Study of Jeffery-Hamel flow problem for nanofluid with fuzzy volume fraction using double parametric based Adomian decomposition method. ***International Communications in Heat and Mass Transfer***, *126*, p.105435.

6. **Biswal, U.** and Chakraverty, S., 2022. Investigation of Jeffery-Hamel flow for nanofluid in the presence of magnetic field by a new approach in the optimal homotopy analysis method. ***Journal of Applied and Computational Mechanics***, *8*(1), pp.48-59.

Publications Cont…

7. Mebarek-Oudina, F., Laouira, H., Hussein, A.K., Omri, M., Abderrahmane, A., Kolsi, L. and **Biswal, U.**, 2022. Mixed convection inside a duct with an open trapezoidal cavity equipped with two discrete heat sources and moving walls. ***Mathematics***, *10*(6), p.929.

8. Younis, O., Alizadeh, M., Kadhim Hussein, A., Ali, B., **Biswal, U.** and Hasani Malekshah, E., 2022. Mhd natural convection and radiation over a flame in a partially heated semicircular cavity filled with a nanofluid. ***Mathematics***, *10*(8), p.1347.

9. Sannad, M., Hussein, A.K., Abidi, A., Homod, R.Z., **Biswal, U.**, Ali, B., Kolsi, L. and Younis, O., 2022. Numerical study of MHD natural convection inside a cubical cavity loaded with copper-water nanofluid by using a non-homogeneous dynamic mathematical model. ***Mathematics***, *10*(12), p.2072.

10. **Biswal, U.**, Chakraverty, S. and Ojha, B.K., 2022. Forward and Inverse Problems Related to Nanofluid Flow Between Nonparallel Planes in Uncertain Environment. ***Journal of Computational and Nonlinear Dynamics***, *17*(8), p.081002.

11. **Biswal, U.**, Chakraverty, S., Ojha, B.K. and Hussein, A.K., 2022. Numerical investigation on nanofluid flow between two inclined stretchable walls by Optimal Homotopy Analysis Method. ***Journal of Computational Science***, *63*, p.101759.

12. Laidoudi, H., Hussein, A.K., Mahdi, A.B., Younis, O., Malekshah, E.H., Togun, H. and **Biswal, U.**, 2022. Numerical Investigation of Buoyancy-driven Flow in a Crescent-shaped Enclosure. ***Jordan Journal of Mechanical & Industrial Engineering***, *16*(4).

13. Hussein, A.K., Rashid, F.L., Abed, A.M., Al-Khaleel, M., Togun, H., Ali, B., Akkurt, N., Malekshah, E.H., **Biswal, U.**, Al-Obaidi, M.A. and Younis, O., 2022. Inverted solar stills: A comprehensive review of designs, mathematical models, performance, and modern combinations. ***Sustainability***, *14*(21), p.13766.

Publications Cont…

14. Younis, O., Hussein, A.K., Attia, M.E.H., Rashid, F.L., Kolsi, L., **Biswal, U.**, Abderrahmane, A., Mourad, A. and Alazzam, A., 2022. Hemispherical solar still: Recent advances and development. ***Energy Reports***, *8*, pp.8236-8258.

15. Hussein, A.K., Hussein, A.A.R.A., Abidi, A., Basem, A., Rashid, F.L., HAMIDA, M.B.B., **Biswal, U.**, Ali, B. and Abdulameer, S.F., 2023. Opposing Mixed Convection in an Open Parallelogram Cavity with the Horizontal Channel: Effects of the Heat Source Length and Location. ***Journal of Advanced Research in Numerical Heat Transfer***, *14*(1), pp.118-135.

16. Alizadeh, M., Fazlollahtabar, A., Hussein, A.K., Ameen, H.A., Ganji, D.D., **Biswal, U.** and Ali, B., 2023. Effect of thermal radiation and magnetic field on heat transfer of SWCNT/water nanofluid inside a partially heated hexagonal cavity. ***Korean Journal of Chemical Engineering***, pp.1-17.

17. Hussein, A.K., Rashid, F.L., Togun, H., Sultan, H.S., Homod, R.Z., Sadeq, A.M., Attia, M.E.H., Ali, B., **Biswal, U.**, Rout, S.K. and Abdulkadhim, A.H., 2024. A review of design parameters, advancement, challenges, and mathematical modeling of asphalt solar collectors. ***Journal of Thermal Analysis and Calorimetry***, *149*(1), pp.41-61.

18. Attia, M.E.H., Hussein, A.K., Rashid, F.L., Ali, B., Saggai, S., **Biswal, U.**, Rout, S.K., Abdulameer, S.F. and Barik, D., 2024. Use of Electrolysis to Produce H2 from Natural and Modified Water. ***Energy Technology***, *12*(1), p.2300918.

19. Kadhim Hussein, A., Pakdee, W., Bechir Ben Hamida, M., Ali, B., Lafta Rashid, F., **Biswal, U.** and S Alhassan, M., 2024. MHD mixed convection flow of alumina-water nanofluid into a lid-driven cavity with different patterns of wavy sidewalls. ***Journal of Computational Applied Mechanics***, *55*(1), pp.92-112.

20. Togun, H., Homod, R.Z., Aljibori, H.S.S., Abed, A.M., Alias, H., Hussein, A.K., **Biswal, U.**, Al-Thamir, M., Mahdi, J.M., Mohammed, H.I. and Ahmadi, G., 2024. Al2O3–Cu hybrid nanofluid flow and heat transfer characteristics in the duct with various triangular rib configurations. ***Journal of Thermal Analysis and Calorimetry***, pp.1-14.

Book and Book Chapters

Book

1. Chakraverty, S. and **Biswal, U.**, 2022. *Modeling and simulation of nanofluid flow problems*. **Springer Nature**.

Book Chapters

1. **Biswal, U.**, Chakraverty, S. and Ojha, B.K., 2020. Natural convection of non-Newtonian nanofluid flow between two vertical parallel plates in uncertain environment. In *Recent Trends in Wave Mechanics and Vibrations* (pp. 295-309). **Springer**, Singapore.

2. Karunakar, P., **Biswal, U.** and Chakraverty, S., 2020. Fluid Dynamics Problems in Uncertain Environment. *Mathematical Methods in Interdisciplinary Sciences*, pp.125-144, **Wiley.**

3. **Biswal, U.**, Chakraverty, S. and Ojha, B.K., 2021. Natural convection in a nanofluid flow. In *New Paradigms in Computational Modeling and Its Applications* (pp. 57-70). **Elsevier**.

4. **Biswal, U.**, Chakraverty, S. and Ojha, B.K., 2021. Vibration of a cantilever beam immersed in a fluid with uncertain parameters. In *Modeling and Computation in Vibration Problems, Volume 2: Soft computing and uncertainty* (pp. 15-1). Bristol, UK: **IOP Publishing**.

5. Hussein, A.K., Kolsi, L., Attia, M.E.H., Younis, O., **Biswal, U.**, Ali, H.M., Ali, B., Hashemian, M., Mallikarjuna, B. and Nikbakhti, R., 2022. Nanoscience and its role in the future of solar stills. In *Industrial Applications of Nanocrystals* (pp. 427-440). **Elsevier**.

Conferences

1. **Biswal, U.**, Chakraverty, S., and Ojha, B. K., 2018. Natural convection of non-Newtonian nanofluid flow between two vertical parallel plates in uncertain environment, **8th National Conference on Wave Mechanics and Vibrations, NIT Rourkela**, Odisha, India.

2. **Biswal, U.**, Chakraverty, S., and Ojha, B. K., 2019. Inverse Analysis of Jeffery-Hamel Flow Problem, **National Conference on Modeling Analysis & Simulation, IIT (ISM)**, Dhanbad, Jharkhand, India.

3. **Biswal, U.,** Chakraverty, S., and Ojha, B. K., Nanofluid flow between two plates in uncertain environment, **International Conference on Mathematical Modelling, Applied Analysis and Computation-2022 (ICMMAAC-22),** dated 4-6 August, 2022, JECRC University, Jaipur (Raj.), India.

Mr. Sahil Rishmilya Pradhan

Course	Institution	Passing Year	Division
B.Sc. (Mathematics)	Laxminarayan College, Jharsuguda	2021	2nd
Intermediate	Laxminarayan College, Jharsuguda	2017	3rd
10th	Debadihi High School, Jharsuguda	2015	1st

Courses assigned in this Session (odd Semester)

- Practical, Core-VII, Partial Differential equation and system of ODEs, 1st year, 1st Semester, B.Sc. Mathematics
- MAT- C -415, MATLAB, 1st Year, 1st Semester, PG Mathematics
- MAT- C -416 PROGRAMMING LABORATORY-I (MATLAB), 1st Year, 1st Semester, PG Mathematics

+3 1st Year

11

+3 2nd Year

13

+3 3rd Year

16

Student Strength for the session 2024-25

Teaching Methodology:

1. **Active Learning**: Engage students with activities like problem solving sessions, group work etc. that require them to actively apply concepts.
2. **Inquiry-Based Learning:** Encourage students to explore mathematical concepts through questions and investigations which fosters critical thinking and allows students to develop their problem-solving skills independently.
3. **Flip Classroom:** Provide lecture materials and readings as homework, and use class time for interactive problem-solving and discussions which allows students to engage with the material at their own pace and use class time more effectively.
4. **Technology Integration:** Utilize mathematical software like MATLAB, Mathematica, online tools like GeoGebra, Desmos, WolframAlpha, and educational apps to visualize concepts, simulate problems, and enhance learning.
5. **Conceptual Understanding:** Focus on building a strong conceptual foundation rather than just procedural skills. Encourage students to understand the "why" behind mathematical processes and theorems.
6. **Collaborative Learning:** Facilitate group work where students can collaborate on solving problems, discuss different approaches, and learn from each other. Peer interactions can enhance understanding and provide different perspectives.
7. **Encourage Mathematical Communication:** Promote the practice of explaining mathematical ideas, reasoning, and solutions both orally and in writing. This helps students articulate their understanding and improves their ability to reason mathematically.

Result Analysis of session 2023-24:

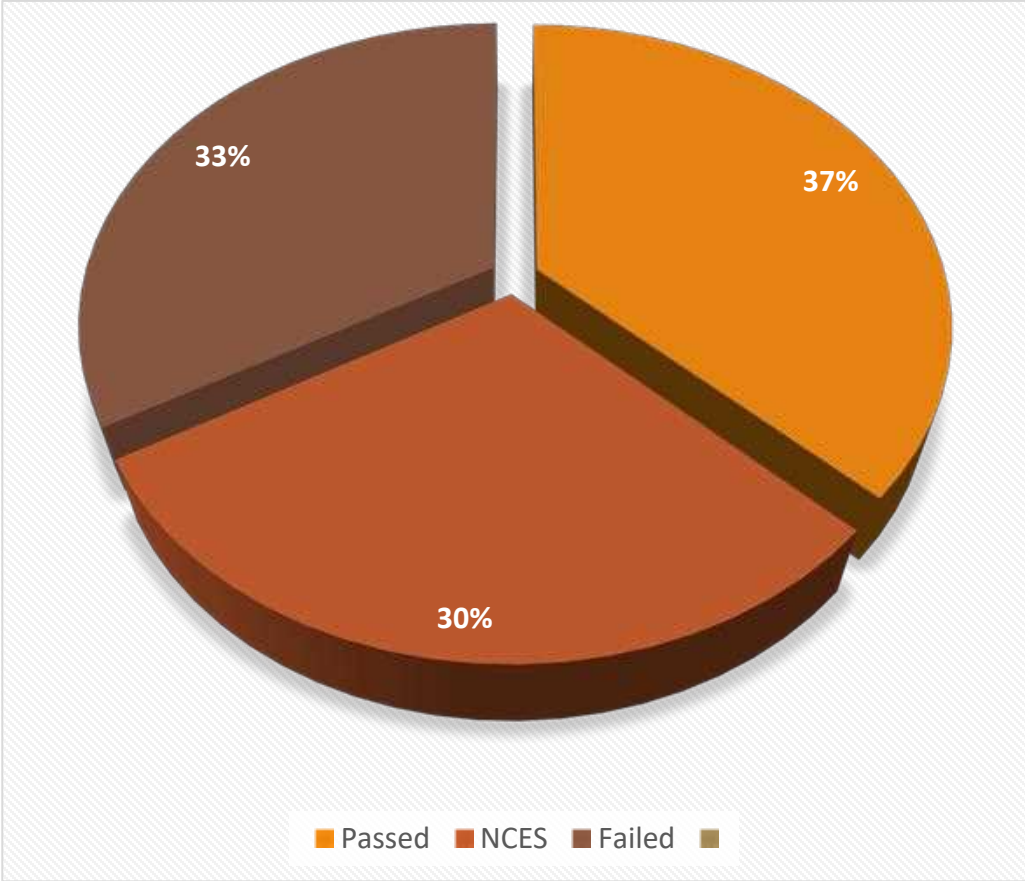
Number of Students appeared- 27 (Reg-17, Ex-Reg-10)

Number of Students Passed-10

- First Class Honours with Distinction -3
- First Class Honours -4
- Second Class Honours -3

Number of students with NCES-8

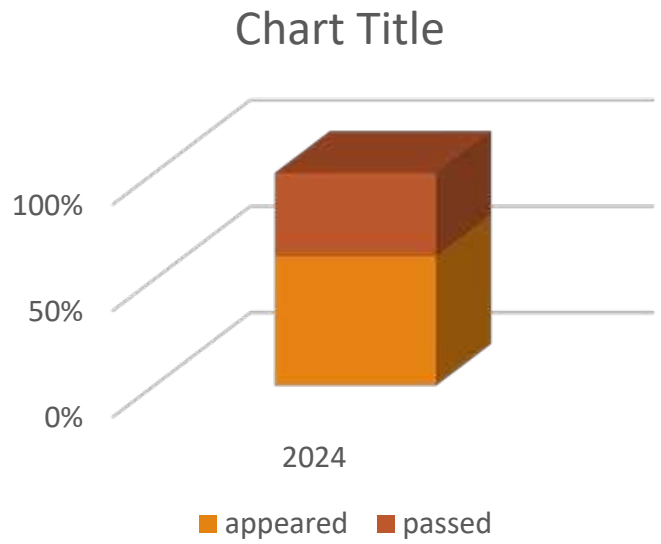
Number of Students Failed-9



Result Analysis of session 2023-24 (Regular)

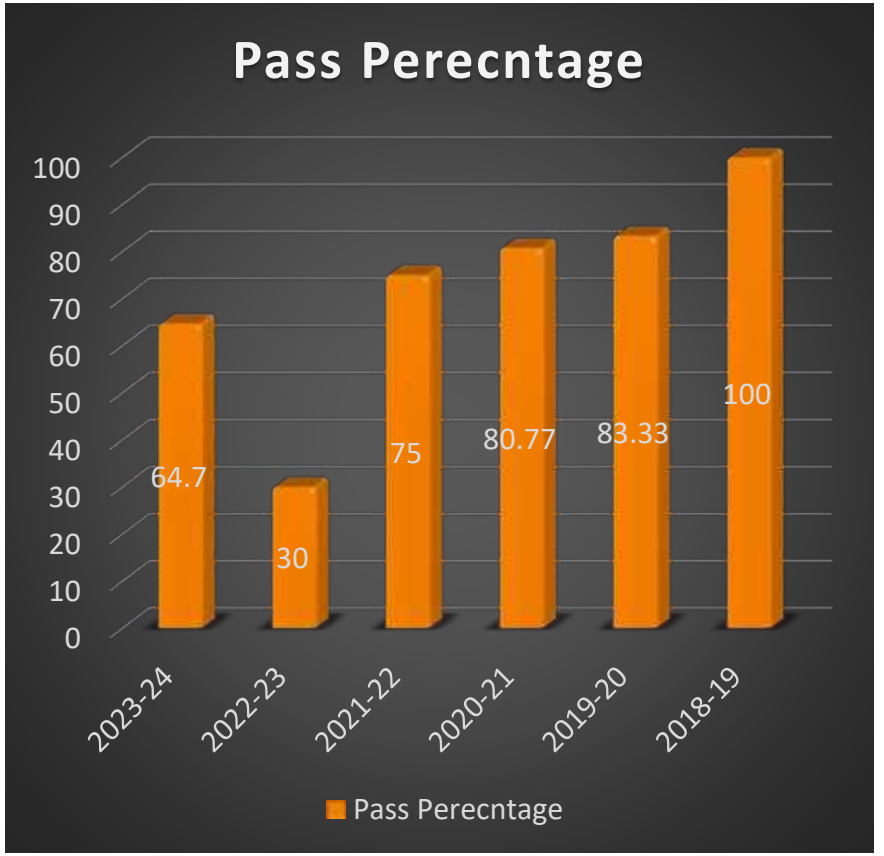
Number of Students appeared- 17

Number of Students Passed-11



Result Analysis of last 5 Sessions

Session	Number of Students appeared	Number of Students Passed	Pass Percentage
2023-24	17	11	64.70
2022-23	20	06	30.00
2021-22	16	12	75.00
2020-21	26	21	80.77
2019-20	24	20	83.33
2018-19	21	21	100.00



Achievers:

Satyajit Satpathy
CUET: PG Mathematics 2024
CPET: PG Mathematics 2024

Bhabani Shankar Kabi
CUET: PG Mathematics 2024
CPET: PG Mathematics 2024

Mamina Patel
CUET: PG Mathematics 2024
CPET: PG Mathematics 2024

Harishankar Sahu
CPET: PG Mathematics 2024

Harekrushna Sahu
CPET: PG Mathematics 2024

Student participation

Bhabani Shankar Kabi and *Mamina Patel* have participated in "**Summer outreach programme in mathematics-2024**" from May 20- June 08, 2024 at **National Institute of Science and Research Bhubaneswar**.

Prominent Alumni

nmi Ranjan Singh Deo, 2019-2022 Batch,
suing M.Sc. Mathematics at IIT
ragpur

Dr. Subhashree Patel, 2011-14 Batch,
Assistant professor, KIIT Bhubaneswar

Shri Narasingha Panigrahi, Retired
Reder in Mathematics, Laxminarayan
college, Jharsuguda

i Lukeswar Kharsel, 2011-2014 Batch,
mmunication Technician in Indian Air
force, Jaisalmer, Rajasthan

Value added course

- Type setting in LaTex : 2023-24.
- It aims at enhancing the documentation skills of the students by using LaTex.
- A total of 15 students have participated and completed the course.

Events organized by Department

Fibonacci Day

23rd November 2023

National Mathematics Day

22nd December 2023

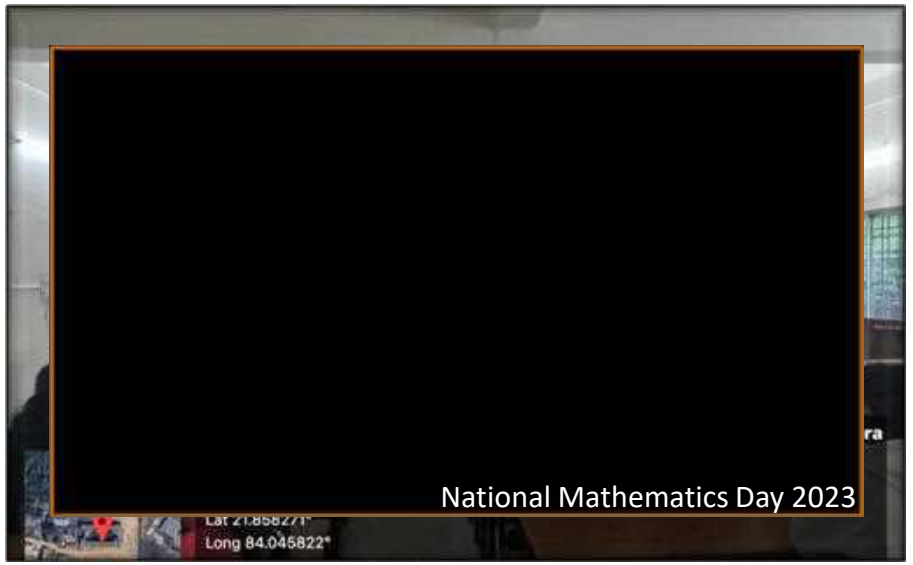
Pi Day

15th March 2024

Events organized by Department


NMD


Orientation



National Mathematics Day 2023


Pi Day 2024


Fibonacci Day

Parent Teacher Meetings(PTMs):

Two Parent Teacher Meetings on 8th November 2023 and 10th February 024 have been conducted during the session .

- An average of 6 parents (5 in 1st one and 7 in 2nd one) attended this meeting.
- Interaction between Parents, Teachers was done.
- A discussion on student's performance, discipline in college and attendance percentage was discussed with the parents.
- One parent was happy with the way the department was conducting meetings in each semester.
- One parent also enquired what kind of placement arrangements are done for their ward.
- Academic Calendar was shared with the parents.
- Feedback and suggestions from the parents were noted for future improvement and holistic development.

PTM held on 8th November 2023.

Meeting between Parents and staff members followed by meeting between Parents Teachers and students.

Departmental Seminars

- Departmental Seminars are held frequently by the Students and Staff Members of our department.
- Seminar by students has helped the students
  - To Gain Confidence.
  - Encouragement and Motivation.
  - Helps in Research.
  - To Enhance soft Skills.
  - Helps in Better Understanding of Theoretical Concepts.
  - To Learn a new Perspective.

Departmental Seminars

Extension Activities:

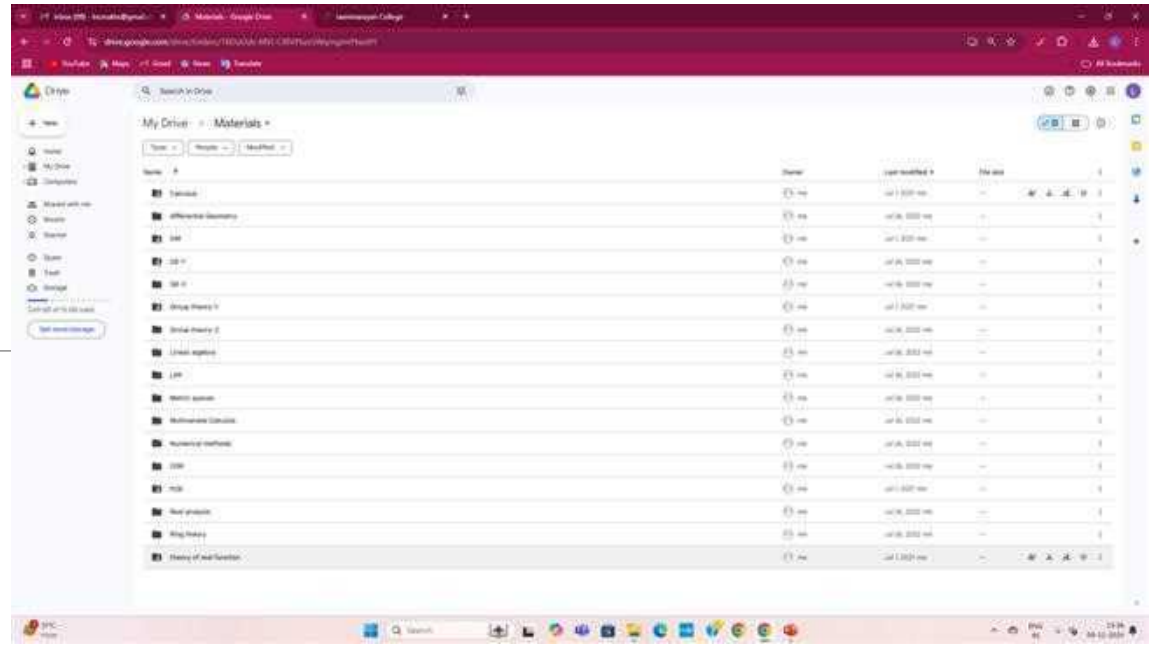
- Study tour has been organized by our department on 13th February 2024 to Planetarium, Sambalpur.
- All the students of +3 final year have participated and benefitted.

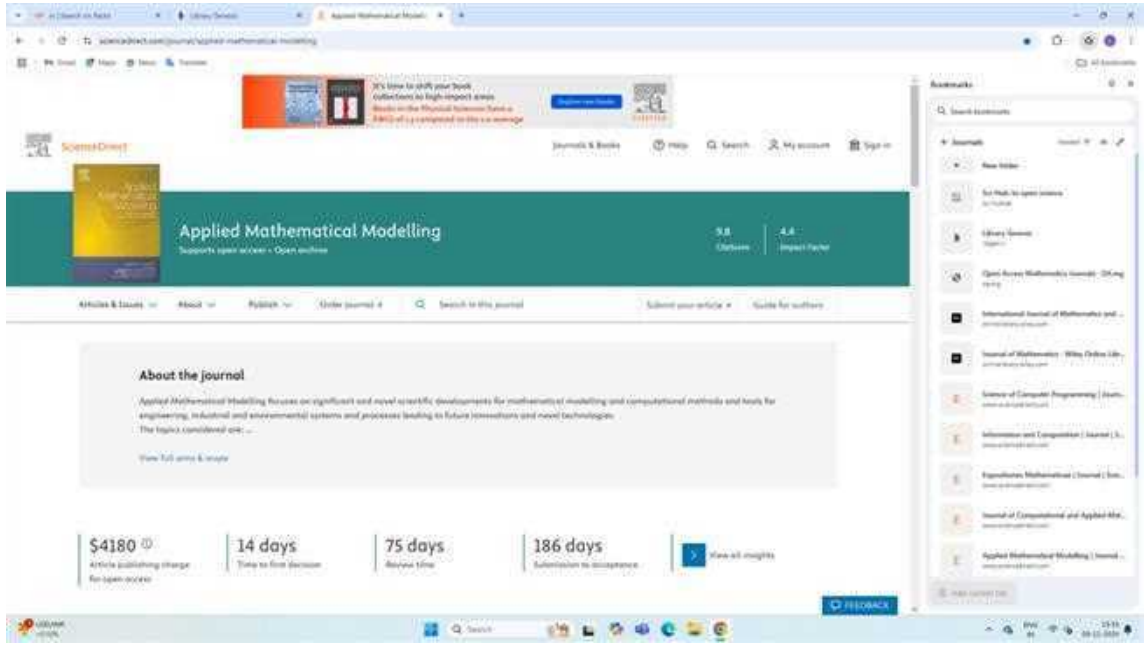
Departmental Library

- Departmental library consists of Several reference books and text books.
- There are a total of 138 no of books are there.
- An issue register is maintained for the issue and return of the books by students.
- The students are allowed to keep the book for a month.
- Few students and stakeholders also donate books.

e- Library

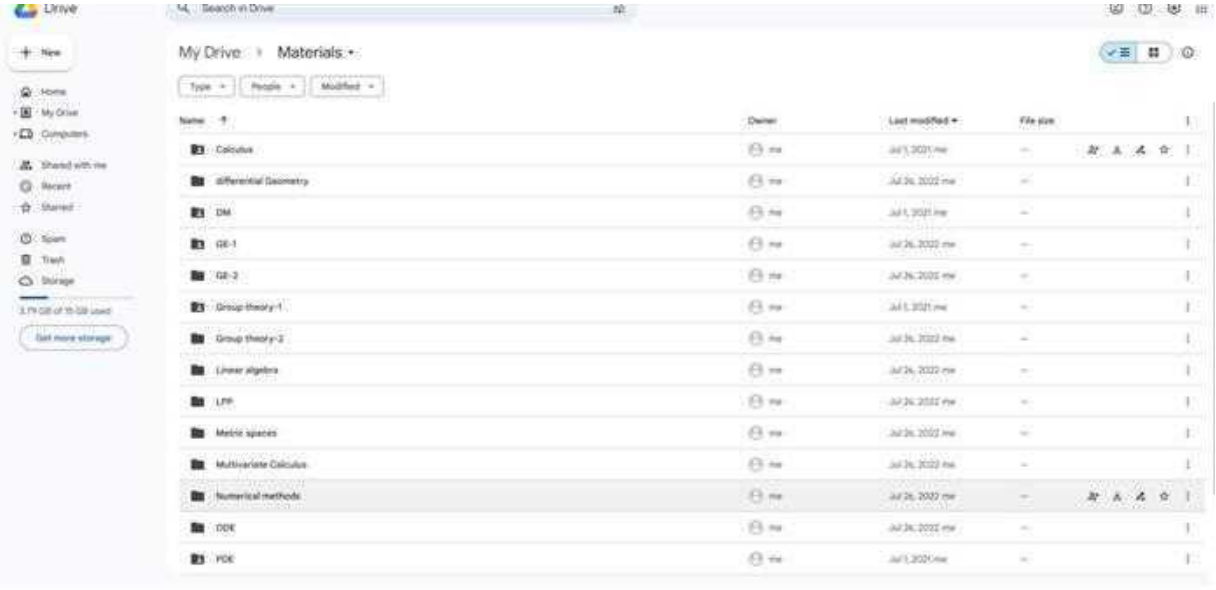
- Electronic copies of different books are available in the departmental computers for easy access of the students.
- Free journals and e-books are saved for students references.





Use of Information and Communication Technology:-

- Licensed MATLAB software (student version) is used for practical.
- e-books and e- contents are made available to the students for references and further studies.
- Student seminars help students to develop ICT skills.



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To,

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Laxminarayan College,Jharsuguda

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