MATH-MAZE

A Subject Based Yearly News Letter

TOPOLOGY

ISSUE - XIII (2019-2020)

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π-MATH ASSOCIATION

PG DEPARTMENT OF MATHEMATICS

VELLALAR COLLEGE FOR WOMEN (Autonomous)

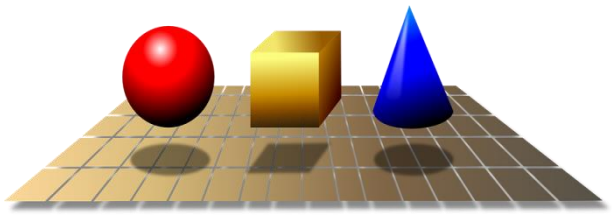
"College with Potential for Excellence"

(Re-accredited with 'A' Grade by NAAC & Affiliated to Bharathiar University, Coimbatore)

Thindal, Erode - 638012, Tamil Nadu.

CONTENTS

❖ Solutions to the above problems are invited, at the earliest. The names of the readers who turn out first in providing answers to the problems will be published and the solutions will be published in the forthcoming issue.



FROM THE EDITORIAL DESK

The Department of Mathematics has been established in the year 2003. It offers B.Sc., Mathematics, M.Sc., Mathematics and M.Phil., Programme.

To its credit, the Department has organized, two National Seminars, two National Conferences, two Intercollegiate meet and an International seminar on 11^{th}& 12^{th} August 2005, 30^{th}& 31^{st} August 2007, 9^{th} January 2014, 9^{th} February 2017, 13^{th} September 2011, 24^{th} August 2018 and 10^{th} January 2018 respectively. It has celebrated National Mathematical Year on 24^{th} August 2012. In memory of Ramanujan's birthday Math Expo has been organized by the Department since 2013.

The Department is enriched with fifteen faculty members having wide knowledge in their specializations like Differential Equations, Fuzzy Set Theory, Intuitionistic Fuzzy Set, Graph Theory and Operations Research. The Department has completed two minor research projects funded by UGC and a student's funded projects funded by TNSCST. The Department has produced56 M.Phil., Research Scholars from 2009 onwards.

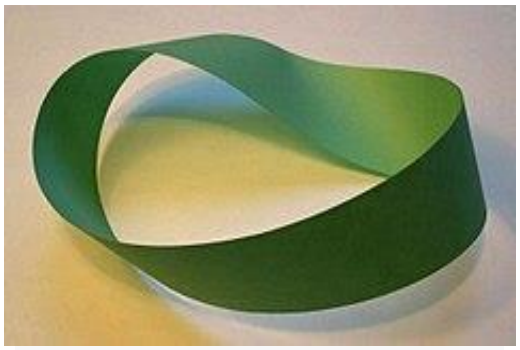
The Department adds one more feather by publishing a Subject Based Yearly News Letter incorporating History of Mathematicians, Crossword Puzzles, Cross out Puzzles, Solutions to the Problems of Previous issue, Departmental Activities and Placement details of the Students of Mathematics.

We welcome the suggestions and criticisms for improvement in the content and presentation of materials of "MATH-MAZE".

EDITORIAL DESK

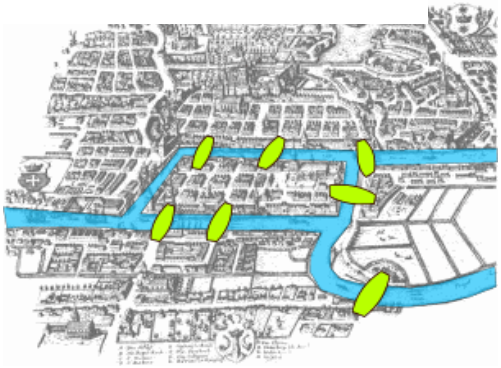
HISTORY OF TOPOLOGY

Topology is concerned with the properties of a geometric object that are preserved under continuous deformations, such as stretching, twisting, crumpling and bending.A topological space is a set endowed with a structure, called a *topology*, which allows defining continuous deformation of all kinds of continuity.



***Mobius Strips**, which have only one surface and one edge, are a kind of object studied in topology.*

Topologywas a well-defined mathematical discipline, originates in the early part of the twentieth century. Topology has been called rubber-sheet geometry. In a topology of two dimensions there is no difference between a circle and a square. A circle made out of a rubber band can be stretched into a square.



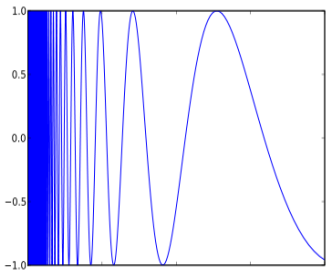
In 1736, Euler published a paper on the Seven Bridges of Konigsberg which is regarded as one of the first practical applications of topology. On 14th November 1750, Euler wrote to a friend that he had realised the importance of the *edges* of a polyhedron.

Further contributions were made by Augustin-Louis Cauchy, Ludwig Schlafli, Johann Benedict Listing, Bernhard Riemann and Enrico Betti.In 1847, Listing introduced the term "Topologie" in his article *Vorstudien zur Topologie*, in German language, which was used in the word for ten years in correspondence before its first appearance in print. The English form "topology" was used in 1883 in Listing's obituary in the journal *Nature* to distinguish "qualitative geometry from the ordinary geometry in which quantitative relations are treated". The term "topologist" in the sense of a specialist in topology was used in 1905 in the magazine *Spectator*.

"Mathematics is the language in which the gods speak to people"

BRANCHES OF TOPOLOGY

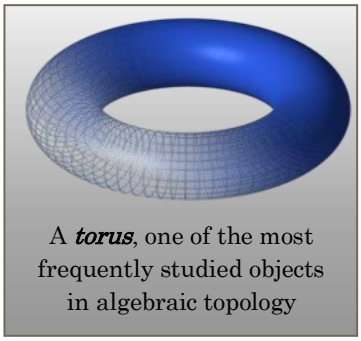
General topology



Topologist Sine Curve

General topology deals with the basic set-theoretic definitions and constructions in topology. It is the foundation of most other branches of topology, including differential topology, geometric topology and algebraic topology.Another name for general topology is *point-set topology.*

Algebraic topology


A ***torus***, one of the most frequently studied objects in algebraic topology

Algebraic topology is a branch oftopologywhich uses tools from algebra to study topological spaces. The basic goal is to find algebraic invariants that classify topological spaces up to homeomorphism and homotopy equivalence.

Differential topology

Differential topology includes spaces with some kind of smoothness associated to each point. In this case, the square and the circle would not be smoothly (or differentiably) equivalent to each other. Differential topology is useful for studying properties of vector fields, such as a magnetic or electric fields.


A Seifert surface bounded by a set of Borromean rings

Geometric topology

Geometric topology is a branch of topology that primarily focuses on low-dimensional upto 4 manifolds and their interaction with geometry.

"Pure Mathematicians just love to try unsolved problems"

APPLICATIONS

- **BIOLOGY**

  Knot theory, a branch of topology, used in biology to study the effects of certain enzymes of DNA.

- **COMPUTER SCIENCE**

  A topological data analysis technique is used to determine thelarge scale structure of a set.

- **PHYSICS**

  Topology is applied in areas such as condensed matter Physics, Quantum Field Theory and Physical Cosmology.

- **ROBOTICS**

  The possible positions of a robot can be describedby a manifold called Configuration Space.

- **GAMES AND PUZZLES**

  Tanglement puzzles are based on topological aspects of the Puzzle's shapes and components.

- **FIBER ART**

  In order to create a continuous join of pieces in a modular construction, it is necessary to create an unbroken path in an order which surrounds each piece and traverses edge only once.

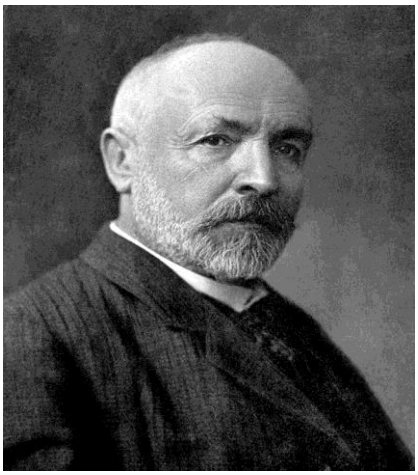
- **ECONOMICS**

  Differential topology and algebraic topology facilitated the development of many crucial concepts in economics namely the Nash equilibrium(solution concept in game theory)for n-person games.

"The uniform character of mathematics is the essence of science, for mathematics is the foundation of all exact scientific knowledge"

KNOW YOUR MATHEMATICIAN

GEORG CANTOR



Georg Ferdinand Ludwig Philipp Cantor (March 3, 1845 – January 6, 1918), the Russian born mathematician Georg Ferdinand Ludwig Philipp Cantor, the father of set theory, is one of the mathematician to whom we owe credit for topology. A German mathematician by the name of David Hilbert described Cantor's discoveries in the infinite domain as an "Astonishing product of Mathematical Thought".

Cantor coined the new word "**transfinite**". It distinguish various levels of infinite numbers from an absolute infinity. Cantor developed important concepts in topology and their relation to cardinality. The cardinality (or size) of a finite set is just a natural number indicating the number of elements in the set. It's denoted by Hebrew letter aleph (ℵ) and defined $\aleph_0$ (aleph-null or aleph-nought) as the cardinality of the countably infinite set of natural numbers, $\aleph_1$ (aleph-one) as the cardinality of uncountable set of ordinal numbers.

Cantor established the importance of one-to-one correspondence between the members of two sets, defined infinite and well-ordered sets and proved that the real numbers are more numerous than the natural numbers.The concept of a one-to-one correspondence and introduced the notion of "power" or "equivalence" of sets: two sets are equivalent (have the same power) if there exists a one-to-one correspondence between them. Cantor defined countable sets (or denumerable sets) as sets which can be put into a one-to-one correspondence with the natural numbers, and proved that the rational

numbers are denumerable. He also proved that n-dimensional Euclidean space R^n has the same power as the real numbers$R$, as does a countably infinite product of copies of R.

"Great innovation only happens when people aren't afraid to do things differently"

FELIX HAUSDORFF

Felix Hausdorff (November 8, 1868 – January 26, 1942) was a German mathematician who is considered to be one of the founders of modern topology and who contributed significantly to set theory, descriptive set theory, measure theory, function theory, and functional analysis.

In topology and related branches of mathematics, a Hausdorff space, separated space or T_2 space is a topological space where any two distinct points there exists a neighbourhood of each which is disjoint from the neighbourhood of the other. Hausdorff made significant contributions to general and descriptive set theory (Hausdorff recursion formula for the aleph exponentiation, higher theory of ordered sets, beginning of the theory on saturated structures, solution to the continuum hypothesis for Borel sets), measure theory (Hausdorff mass and Hausdorff dimension, sphere paradox), algebra (Baker-Campbell-Hausdorff formula), functional analysis (Hausdorff limit theorems and problems of moments, Hausdorff-Young inequality), probability theory (semi-invariants, Gram-Charlier series) and insurance mathematics (first proof for the Hattendorff theorem, individual risk theory).

Hausdorff was working in the area for which he is famous in topology and set theory. He introduced the concept of partially ordered set and proved a series of results on ordered sets. Hausdorff also published his famous text and created a theory of topological and metric spaces. In addition he enriched it with many notions, theorems and other special topics fitted naturally into the framework in topological and metric spaces.

"Quadratic reciprocity is the song of love in the land of prime numbers"

EULERS

Leonhard Euler (April 15, 1707 – September 18, 1783) was aSwiss mathematician, a physicist, astronomer, geographer, logician and engineer whomade important and influential discoveries in many branches of Mathematicssuch as infinitesimal calculus and graph theory, while also making pioneering contributions to several branches such as topology and analytic number theory.

Euler was one of the most eminent mathematicians of the 18th century.Euler is well known for his works in mechanics, fluid dynamics, optics, astronomy and music theory.Euler is the only mathematician to have two numbers named after him. The important Euler's number in calculus is e which is approximately equal to 2.71828 and the Euler - Mascheroni constant γ (gamma) sometimes referred as "Euler's constant" which is approximately equal to 0.57721.

The **Seven Bridges of Konigsberg** is a historically notable problem in Mathematics. Its negative resolution by Leonhard Euler in 1736 laid the foundations of graph theory and prefigured the idea of topology. Euler proved that the problem has no solution. The difficulty he faced was the development of a suitable technique of analysis and of subsequent tests that established this assertion with mathematical rigor.Euler's recognition that the key information was the number of bridges and the list of their endpoints presaged the development of topology. The difference between the actual layout and the graph schematic is a good example of the idea that topology is not concerned with the rigid shape of objects.

"Logic is the foundation of the certainty of all the knowledge we acquire."

TOPOLOGY-BASIC DEFINITIONS

TOPOLOGICAL SPACE

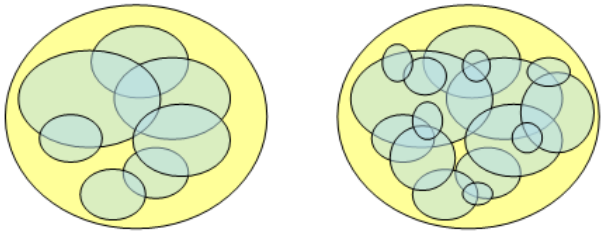
A topological space (X, T) is a set X equipped with a collection T of subsets of X satisfying the following axioms:

1. The empty set and X are in T.
2. The union of any collection of sets in T is also in T.
3. The intersection of any pair of sets in T is also in T.

The collection T is a **topology** on X.

FINER AND COARSER TOPOLOGY

Suppose T_1, T_2 are both topologies on X. If $T_1 \subset T_2$, then we say T_2 is a **finer topology** than T_1, conversely T_1 is a **coarser topology** than T_2.



BASIS FOR A TOPOLOGY

If X is a set, a **basis for a topology** on X is a collection $\mathcal{B}$ of subsets of X (called basis elements) such that

1. For each $x \in X$,there is atleast one basis element B containing x.
2. If x belongs to the intersection of two basis elements B_1 and B_2,then there is a basis element B_3 containing x such that $B_3 \subset B_1 \cap B_2$.

"The essence of Mathematics, resides in its freedom"

STANDARD TOPOLOGY

If $\mathcal{B}$ is the collection of all open intervals in the real line, $(a,b) = \{x | a < x < b\}$. The topology genereated by $\mathcal{B}$ is called the **standard topology** on the real line.

LOWER LIMIT TOPOLOGY

If $\mathcal{B}'$ is the collection of all half-open intervals of the form $[a,b) = \{x | a \leq x < b\}$, where $a < b$, the topology generated by $\mathcal{B}'$ is called the **lower limit topology.** It is denoted by $\mathbb{R}_l$.

***K*-TOPOLOGY**

If $\mathcal{B}''$ is the collection of all open intervals (a,b), along with all sets of the form $(a,b) - K$, where K denote the set of all numbers of the form $1/n$, for $n \in Z$. The topology generated by $\mathcal{B}''$ is called the ***K*-topology** on $\mathbb{R}$. We denote it by $\mathbb{R}_k$.

PRODUCT TOPOLOGY

Let X and Y be topological spaces. The **product topology** on $X \times Y$ is the topology having basis as the collection $\mathcal{B}$ of all sets of the form $U \times V$, where U is an open subset of X and V is an open subset of Y.

BAIRE SPACE

A space is a **Baire space** if the intersection of any countable collection of dense open sets is dense otherwise defined as the set of all functions from the natural numbers to the natural numbers, with the topology of pointwise convergence.

CONNECTED

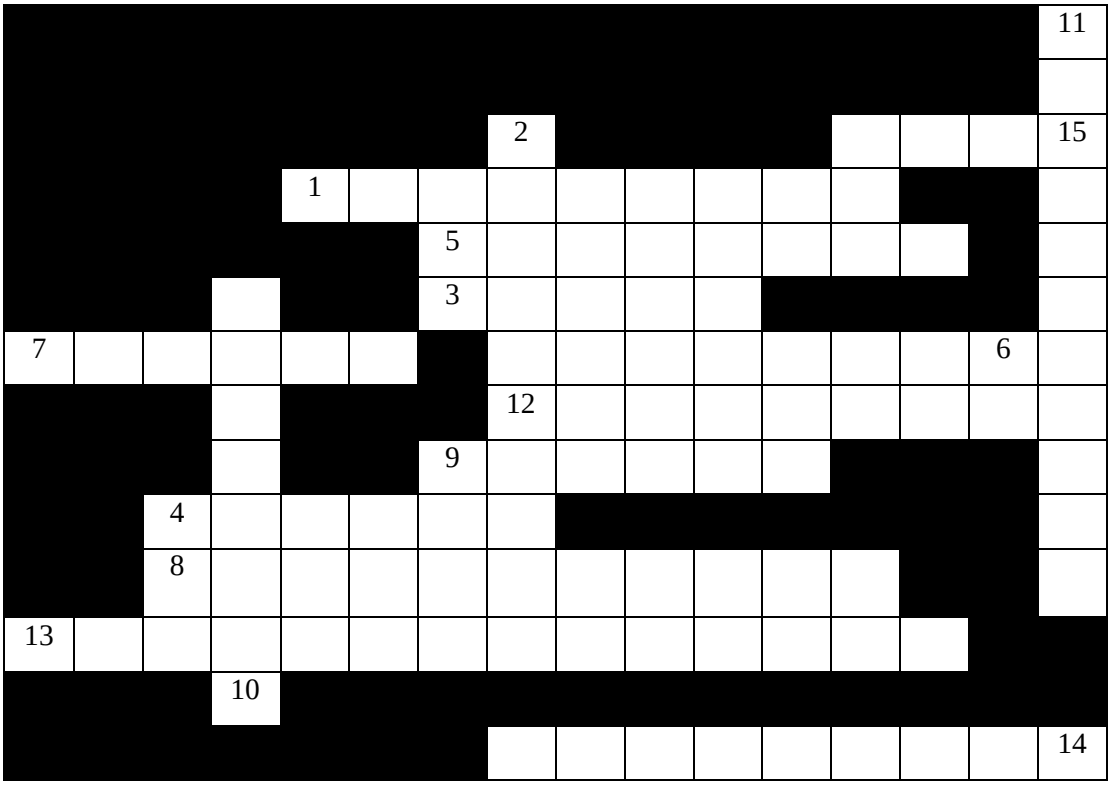
A space is connected if it is not the union of a pair of disjoint nonempty open sets. Equivalently, a space is connected if the only clopen sets are the whole space and the empty set.

CONTINUUM

A space is called a continuum if it is compact, connected Hausdorff space.

“Topology is the mathematical discipline that allows the passage from local to global”

CROSS WORD PUZZLES



LEFT TO RIGHT

1. A space having countable dense subset is open said to be _____ .

3.The standard topology on R is called as _____ topology.

4. Every finite point set in a Hausdroff space X is _____ .

5. A space for which every open covering contains a countable subcovering is called a _____ space.

7. A simply ordered set L having more than one element is called a _____ continuum.

8. The map $f: X \to Y$ is a _____ imbedding.

9. Every metrizable space is _____ .

12. A metric space (x, d) is said to be totally _____ .

13. A topological space X is called _____ .

"Go down deep enough into anything and you will find Mathematics"

RIGHT TO LEFT

6. A _____ of a first countable space is first countable.

14. The finite cartesian product of connected space is _____ .

15. Collection of subset of τ is called _____ sets.

UP TO DOWN

2. The space$Q$ of rationals is not a _____ space.

11. The mapping φ_1 and φ_2 are called _____ .

DOWN TO UP

10. If X is a space a point x of X is said to be an _____ point of X , if the one point set$\{x\}$is open in X.

"Mathematics consists of proving the most obvious thing in the least obvious way"

CROSS OUT PUZZLES

D	E	S	N	E	D	C	O	U	N	T	A	B	L	E
K	X	N	L	E	Y	G	O	L	O	P	O	T	P	Y
L	O	O	S	I	N	G	I	R	R	V	C	V	S	I
T	Y	O	D	I	N	N	B	O	E	Z	O	Q	P	S
C	L	D	S	R	D	O	I	C	W	Q	N	T	R	O
C	L	O	P	E	N	R	N	S	L	E	V	N	I	L
I	P	A	L	S	E	E	B	J	N	C	E	I	N	A
T	A	O	X	T	U	J	G	D	A	A	R	O	G	T
A	F	E	X	Q	S	Z	E	R	O	P	G	P	E	E
R	I	E	E	L	K	T	C	V	P	S	E	T	G	D
B	E	S	T	A	B	E	K	M	E	E	S	I	A	Z
E	E	T	E	R	C	S	I	D	N	R	O	M	M	X
G	N	E	I	G	H	B	O	U	R	I	Q	I	I	C
L	T	Y	C	H	O	N	O	F	F	A	Z	L	I	E
A	X	E	C	O	M	P	A	C	T	B	A	I	R	E

1. A space is almost _____ if every open set is closed.
2. A space is a_____ if the intersection of any countable collection of dense open sets is dense.
3. A borel set is an element of an borel _____ .
4. A set is _____ if it is both open and closed.
5. A set is _____ if its complement is a member of the topology.
6. A space is _____ if every open cover has a finite subcover.
7. A metric space is complete if every cauchy sequence _____ .
8. A set is dense-in-itself, if it has no _____ point.
9. The _____ of a set is the interior of its complement.
10. A space is first countable, if every point has a _____ local base.
11. Every neighbourhood of X contains a point of S other than X itself, it is called _____.
12. A space is _____ if every open cover has a countable subcover.
13. A function from one space to another is open, if the _____of every open set is open.
14. A space is sequentially compact if every _____has a convergent subsequence.
15. A space is _____ dimensional if it has a base of clopen sets.

"An educated mind is useless without a focussed will and dangerous without a loving heart"

FIELDS MEDAL

The **Fields Medal** is awarded to recognize outstanding mathematical achievements for existing work and for the promise of future achievement. The Fields Medal is awarded to two, three or four Mathematiciansless than 40 years of age at the International Congress of the International Mathematical Union (IMU), a meeting that takes place every four years.The Fields Medal is one of the most prestigious awards in the field of Mathematics and is often described as the Nobel Prize of Mathematics.

The medals and cash prizes are funded by a trust established by J.C.Fields at the university of toronto. The Fields Medal is made up of 14KT gold material. Its diameter is 63.5mm and its weight is 169 gram respectively. The head of Fields Medal represents Archimedes facing right.

The inscription on the Fields Medal describes that “The Mathematicians having congregated from the whole world awarded because of outstanding writings”.

The obverse of the Fields Medal The reverse of the Fields Medal

The Fields Medal is a good indicator of current fertile areas of mathematical research, as the winners have generally made contributions that opened up whole fields or integrated technical ideas and tools from a wide variety of disciplines. A preponderance of winners worked in highly abstract and integrative fields such as Algebraic geometry and algebraic topology.

“The study of mathematics, like the Nile, begins in minuteness but ends in magnificence"

MEDALISTS NAME AND REASON

- **Lars Ahlfors(*1936*)**Awarded medal for research on covering surfaces related to Riemann Surfaces of Inverse function of entire and meromorphic functions
- **Jesse Douglas (1936)** For important work on Plateau problem which is concerned with finding minimalsurfaces connecting and determined by some fixed boundary.
- **Atle Selberg(1950)**Achieved major results on Zeros of the Riemann Zeta functionand gave anelementary proof of the Prime Number Theorem.
- **Jean-Pierre Serre(1954)**Achieved major results on Homotopy groups of spheres, especially in the use of methods of Spectral Sequences.
- **Klaus Roth(1958)**Proved that a sequence with no three numbers in arithmetic progression has zero density.
- **John Milnor(1962)**Proved that a 7-dimensional sphere can have several differential structures; this led to the creation of the field of Differential Topology.
- **John G.Thompson(1970)** Proved jointly with W.Feit that all non-cyclic finite simple groups have even order.
- **Michael Freedman(1986)**Developed proof of the four dimensional Poincare conjecture.
- **Jean Bourgain (1994)** Worked on several topics of Mathematical Analysis, the geometry of Banach spaces, nonlinear partial differential equations from Mathematical Physics.
- **Laurent Lafforgue (2002)** Awarded for his proof of langlandy correspondence for the full linear groups over function fields.
- **Terernce Tao (2006)** For his contributions to partial differential equations , combinatorics, harmonic analysis and additive number theory.
- **Elon Lindenstrauss(2010)** For the results on measure rigidity in ergodic theory and their to applications to number theory.
- **Maryam Mivzakhani (2014)** For her outstanding contributions to the dynamics and geometry of Riemann surfaces and their moduli spaces.
- **Akshay venkatesh (2018)** For his synthesis of analytic number theory, homogeneous dynamics,topology and representartion theory.

"Logic and Mathematics are nothing but specialised Linguistic Structures"

PRIZES, AWARDS AND HONORS FOR WOMEN MATHEMATICIANS

PRIZES AND AWARDS

- Fields Medal
- Abel Prize
- Ruth Lyttle Satter Prize in Mathematics
- Louise Hay Award for Contributions to Mathematics Education
- Leroy P. Steele Prize for Seminal Contribution to Research
- Leroy P. Steele Prize for Mathematical Exposition
- Leroy P. Steele Prize for Lifetime Achievement
- Chauvenet Prize
- Euler Book Prize
- Beckenbach Book Prize
- MacArthur Fellowships
- Alice T. Schafer Prize
- M. Gweneth Humphreys Award for Mentorship of Undergraduate Women in Mathematics
- AWM-Microsoft Research Prize
- AWM-Sadosky Research Prize
- AWM-Joan & Joseph Birman Research Prize in Topology and Geometry
- AWM-Ruth I. Michler Memorial Prize
- MAA Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics
- Sylvester Medal of the Royal Society of London
- De Morgan Medal of the London Mathematical Society
- Adams Prize
- CRM-Fields-PIMS Prize
- Florence Nightingale David Award
- Elizabeth L. Scott Award
- Janet L. Norwood Award
- Salem Prize
- Blackwell-Tapia Prize

"The mistakes and unresolved difficulties of the past in Mathematics have always been the Opportunities of its Future"

LECTURE SERIES

- AWM Emmy Noether Lecturers
- ICM Emmy Noether Lecturers, International Congress of Mathematicians
- AWM/MAA Falconer Lecturers
- AWM-SIAM Sonia Kovalevsky Lecturers
- Krieger-Nelson Prize Lectureship for Distinguished Research by Women in Mathematics
- Mary Cartwright Lecturers
- American Mathematical Society Colloquium Lecturers
- Josiah Willard Gibbs Lecturers
- Earle Raymond Hedrick Lecturers
- J. Sutherland Frame Lecturers

OFFICES

- Presidents of the Association for Women in Mathematics
- Presidents of the Mathematical Association of America
- Presidents of the American Mathematical Society
- Presidents of the Society for Industrial and Applied Mathematics
- Presidents of the Society for Mathematical Biology

"The definition of a good Mathematical problem is the Mathematics it generates rather than the problem itself."

WOMEN ACHIEVERS IN MATHEMATICS

HYPATIA 370-415ADHypatia of Alexandria was the daughter of a mathematician Theon of Alexandria and took her father as an inspiration to become a mathematician herself. Not only shewas a mathematician but a philosopher as well. She taught as the head at a school, her subject was the knowledge of Plato and Aristotle. She is the first woman to make valuable contributions in the field of mathematics. Hypatia was the first woman to take the bold step to pursue with her dreams and became an inspiration to many young women who became the world's most famous geniuses ever.She is remembered especially for her detailed description of the early hydrometer.

"It is impossible to be a Mathematician without being a poet in soul"

MARY SOMERVILLE 1780-1872

Mary Somerville was a mathematician, scientist, astronomer, geographer and a gifted science writer. Somerville published papers on scientific subjects based on her own research. She also wrote about the ideas and work of other scientists as well. One book, "The Connection of the Physical Sciences," contained discussion of a hypothetical planet that might be affecting the orbit of Uranus. That prompted John Couch Adams to search for the planet Neptune, for which he is credited as a co-discoverer.Mary Somerville's translation and expansion of Pierre Laplace's "Celestial Mechanics" in 1831 won her acclaim and success.

ADA LOVELACE 1815-1852

Ada Lovelace's nickname was "The Enchantress of Numbers".The world's first computer programmer to acknowledgement when she was translating the memoir of Charles Babbage. She did an analytical review and revised the memoir by adding her own method of calculating a sequence of Bernoulli numbers, the first computer program ever.

"The pure Mathematician,like the Musician,is a free creator of his world of ordered beauty"

FLORENCE NIGHTINGALE

1820-1910Florence Nightingaleis referred to as 'the lady with the lamp'. She is famous for

being a nurse who was full of compassion and the founder of modern nursing. After caring for soldiers in the Crimean War, Nightingale famously revolutionised the nursing profession, but her mathematical innovations are less well known. To present her case for better medical care to the UK government she developed a flair for statistics. She was the first one to use circular diagrams as pictorial aids and invented a “polar area graph”, similar to a pie chart.

MARYAM MIRZAKHANI 1977-2017

Mirazakhani is an Iranian mathematician and the first of the Iranian women to have multiple accomplishments starting from a very young age. She gathered a gold medal in the international mathematical Olympaid. She was also the first of to be honored with a Fields Medal, one of the most valuable and prestigious award in mathematics, she achieved the award for her work in understanding the symmetry of curved surfaces. Mirazakhani is currently working as a professor of mathematics at Stanford University. Mirazakhani isan outstanding, inspirational and admirable woman.

“Mathematics reveals its secrets only to those who approach it with pure love, for its own beauty”

SOLUTIONS TO THE PROBLEMS OF THE PREVIOUS ISSUE

CROSSWORD PUZZLES – DIFFERENTIAL EQUATION

RIGHT TO LEFT

6. Adjoint

12. Obtained

16. Contrast

LEFT TO RIGHT

1. Variable

3. Bessel

4. Growth

5. Gronwalls

8. Exponential

9. Fundamental

10. Riemann

15. Euler

14. One

UP TO DOWN

2. First

11.Derivative

13. Homogeneous

17. Minus

DOWN TO UP

7. Even

CROSS OUT PUZZLES

1.Positive

2.Discontinuous

3. Constant

4. Laplace Transform

5. Operational

6. Power Series

7. Two
8. Bernoullis
9. Special
10. Position
11. Stability
12. Derivatives
13. Greater
14. Independent
15. Uniqueness

CONGRATULATIONS

Congratulations to the following readers who turn out first in providing answers to the problems of the previous issue:

CROSSWORD PUZZLE

B.Anitha(III-B.Sc., Maths ‘A’)

T.Preethi(III-B.Sc., Maths ‘B’)

CROSS OUT PUZZLE

J.Mohanapriya(II-M.Sc., Maths ‘A’)

D.Nikitha(II-M.Sc., Maths ‘B’)

DEPARTMENT ACTIVITIES

1. As a part of Bridge Course, the fresher’s were acquainted with **“Fundamentals of Mathematics”** on 24.06.2019. The aim of the entry level test is to enable them to cope with the transform from school to college level. Basic skills of students was tested through entry level test, which carries questions from the topics Trigonometry, Differentiation and Integration, Statistics, Complex Analysis and Vector Analysis. 111 students were benefited in this Bridge Course.

2. One day workshop on **‘Problem Solving in Analysis’** have organized on 12th September 2019, **Mr.R.SureshKannan**, M.sc., M.Phil., SET., NET., Assistant Professor, Department of Mathematics, Madurai kamaraj University Constituent College, Thirumangalam exposed several methods for solving problems in Set Theory, Functions, Convergence, Divergence etc., and also he addressed on how to prepare for Eligibility and Competitive exams like SET,

NET, GATE, JEE . 210 students attended the workshop and they acquired deeper knowledge to solve the problems logically in Analysis.

3. On 22.09.2019 an **Alumni meet** was organized for 2017 – 2018 graduates. 170 alumnae were participated in the function. In response, few of the alumnae shared their experiences as well as interesting moments of their campus life. The current position of the alumnae was recorded. The alumnae thanked the Institution and the department for arranging the meet and they expects more meetings in future.

4. To render respectful accolades to the Math icon Ramanujam, **"MATH EXPO – 19"** was organized on 20.12.2019 for his 132th birthday celebration, **Mr.Venkatachalam Nallikovil Marappan,** Senior Project Engineer, Oman LNG L.L.C, Oman was the chief guest. 1156 students from various science departments of Vellalar college for Women, Vellalar Matriculation School and Vellalar State Board have been benefitted from the Expo and gathered innovative ideas to expose Mathematical skills.

5. An One day Seminar on **'Applications of Differential Equations'** on 24.012020, **Dr.A.Vinodkumar,** Assistant Professor (Selection Grade), Department of Mathematics, Amrita School of Engineering, Amrita Vishwa Vidyapeetham University, Coimbatore delivered specific methodologies, techniques and resources for solving problems in Differential Equations. He also extracted information about partial derivative models and interpret reality in Differential Equations. He evaluated problems like homogeneous, exact and linear first order differential equations.

6. PG Department of Mathematics had organized a Special Meeting on 11.01.2020. **Miss.A.Saranyadevi,** Ph.D., Research Scholar, Ramanujan Institute for Advanced Study in Mathematics, gave a speech on **Mysteries in Mathematics**for final UG students.

7. The final UG, PG Students and Staff members of our Department visited **one day trip** to Kodaikanal on 31.01.2020 and Pondicherry on 29.02.2020 respectively.

8. **Association Competitions** such as Sudoku, Math Quiz, Power Point Presentation and Math Olympiad were conducted by the Department of Mathematics on 07.02.2020 to activate the interest of the students.

9. As a part of **Extension Activity**, the UG & PG students of our department made an enthusiastic activity, learning Mathematics through innovative models for the students of B.F.G.M Nithiyuthavi Thuvakkappalli, Chinnappuliyur on 12.02.2020. Working Models had been donated to school based on their syllabus.

10. On 01.03.2020 an **Alumni meet** was organized for 2018 – 2019 graduates. 194 alumnae were participated in the function. In response, few of the alumnae shared their experiences as well as interesting moments of their campus life. The current position of the alumnae was recorded.

STUDENT ACTIVITIES

(i)Paper presented in Seminar / Conference / Workshop/Symposium

S. No	Name & Class	Title of Seminar/ Conference/ Workshop/ Symposium	Organizer	Title of the Paper	Date
1	D.Dharani II MSc Maths A	International Conference on "Recent Trends in Computational Mechanics"	Nandha Arts and Science College, Erode	Graph Theory in Computer Science	02.08.2019
2	V.Kowsika II MSc Maths A			Graph Theory in Computer Science	02.08.2019
3	K.Keerthana II MSc Maths A			Graph Theory in Robotics	02.08.2019
4	V.Keerthana II MSc Maths A			Graph Theory in Robotics	02.08.2019
5	V.Nandhini II MSc Maths B			Applications of Mathematics in Cryptography	02.08.2019

6	V.Sangeetha II MSc Maths B			Applications of Mathematics in Cryptography	02.08.2019
7	N.Sangeetha II MSc Maths B			Rubik Cube	02.08.2019
8	R.Santhiya II MSc Maths B			Algebra based	02.08.2019
9	D.Sowmiya II MSc Maths B			Using Fuzzy logic Controller	02.08.2019
10	V.Niveka II MSc Maths B	International Conference on "Recent Trends in Computational Mechanics"	Nandha Arts and Science College, Erode	MOBILE ROBOT	02.08.2019
11	E.Meena II MSc Maths A	National Conference on "Mathematical and Computational Science"	P.K.R Arts College for Women, Gobichettipalayam	Geogebra	07.08.2019
12	S.Nandhini II MSc Maths B	National Conference on "Mathematical and Computational Science"		Information and Communication Technolgy using Mathematics Solving Rubik's Cubes using Group Theory	07.08.2019
13	P.Mythili II MSc Maths B	National Conference on "Mathematical and Computational Science"			07.08.2019
14	R.Thirumalini II MSc Maths B	National Conference on "Mathematical and Computational Science"	P.K.R Arts College for Women, Gobichettipalayam	Information and Communication Technolgy using Mathematics Solving Rubik's Cubes using Group Theory	07.08.2019
15	J.Varshini II MSc Maths B	National Conference on "Mathematical and Computational Science"		Applications of Fuzzysets and Fuzzy logic	07.08.2019
16	K.Nandhini II MSc Maths B	National Conference on "Mathematical and Computational Science"		Applications of Fuzzysets and Fuzzy logic	07.08.2019
17	E.Gowri II MSc Maths A	National Conference on	P.K.R Arts College for	Geogebra	07.08.2019

		"Mathematical and Computational - Science"	Women,Gobichettipalayam		
18	P.Priyadharshini II MSc Maths B	National Conference on "Mathematical and Computational Science"		Information and Communication Technolgy using Mathematics Solving Rubik's Cubes using Group Theory	07.08.2019
19	B.Bavatharani II MSc Maths A	One Day Workshop on Innovation in Mathematics SOLSTICE '19	Bharathidasan College of Arts and Science, Erode	Graph theory and Applications	06.10.2019
20	P.Manjula II MSc Maths A			Graph theory and Applications	06.10.2019
21	S.Monika II MSc Maths A			Application of Differential Equations	06.10.2019
22	M.Dharani II MSc Maths A			Application of Differential Equations	06.10.2019
23	N.Rajeshwari II MSc Maths B			Application of Fuzzy Set and Fuzzy Logic	06.10.2019
24	Y.Nandhini II MSc Maths B			Application of Fuzzy Set and Fuzzy Logic	06.10.2019
25	B.Anitha III BSc Maths A		Sri Ramakrishna Mission Vidyalaya College of Arts and Science, Coimbatore	Applications of Mathematics	06.10.2019
27	K.Varsha II MSc Maths B	"VINCULUM" Intercollegiate Meet	A.V.P College of Arts and Science,Tirupur	Mathematics in Real Life	13.10.2019
28	M.Yogeshwari II MSc Maths B			Mathematics in Real Life	13.10.2019
29	S.T.Pavithra I MSc Maths B	National Conference on "Modern and Ancient Techniques in Mathematical Modelling"	Sri Krishna Arts and Science College	Concepts using Graph Theory in Real Life	08.01.2020
30	R.Soundharya I MSc Maths B			Concepts using Graph Theory in Real Life	08.01.2020
31	S.Pavithra II MSc Maths B			Concepts using Graph Theory in Real Life	08.01.2020

32	P.Poovizhi II MSc Maths B			Mathematical Solution for Glucose-Insulin Regulatory System of Diabetes System	08.01.2020
33	P.Sowmiya I MSc Maths B			Mathematical Solution for Glucose-Insulin Regulatory System of Diabetes System	08.01.2020
34	M.Yazhini II MSc Maths B	Seminar on "Generalised Sets- A Tool for Soft Computing and Continuity of Fractional Derivatives"	Sasurie College of Arts and Science,Tirupur	Application of Fuzzy sets and Fuzzy logic	27.01.2020
35	S.Priyadharshini II MSc Maths B			Application of Fuzzy sets and Fuzzy logic	27.01.2020
36	K.Ponramila II MSc Maths B			Applications of DDE IN Biological Models	27.01.2020
37	T.Saranitha II MSc Maths B			Applications of DDE IN Biological Models	27.01.2020
38	D.Nikitha II MSc Maths B			Mobile Robot Navigation Using Fuzzy Logic	27.01.2020
39	S.Vinitha II MSc Maths B			Mobile Robot Navigation Using Fuzzy Logic	27.01.2020
41	S.Pavithra II MSc Maths B	Seminar on "Generalised Sets- A Tool for Soft Computing and Continuity of Fractional Derivatives"	Sasurie College of Arts and Science,Tirupur	Flower Pollination using Mathematics	27.01.2020
42	S.Gunasundari II MSc Maths A			Temprature Control using Fuzzy Logic	27.01.2020
45	E.Barani II MSc Maths A			Fourier Transform using on Mobile Phone	27.01.2020
46	R.Deepthi I MSc Maths A	International Confernce on SAARC Countries Relationship with India.Policies,Challenges and Strategies (ICSIPCS-2020)	Kongu Engineering College,Perundurai	Welfare of Our Nation with SAARC Policies Challenges and Strategies	30.01.2020 to 31.01.2020
47	R.Shobana I MSc Maths A			Welfare of Our Nation with SAARC Policies Challenges and Strategies	30.01.2020 to 31.01.2020

48	R.Savitha II MSc Maths B	Intercollegiate Meet SPECTRA 2K30	Erode Arts and Science College,Erode	Application in Fuzzy Sets and Fuzzy Logic	12.02.2020
49	S.Soundarya II MSc Maths B			Application in Fuzzy Sets and Fuzzy Logic	12.02.2020
50	M.Muneeswari II MSc Maths A			Application of the Fuzzy Logic	12.02.2020
51	K.Deepika II MSc Maths A			Application of the Fuzzy Logic	12.02.2020
52	R.Savitha II MSc Maths B	Intercollegiate Meet SPECTRA 2K20	Erode Arts and Science College,Erode	Application of the Fuzzy Logic	12.02.2020
53	S.Soundarya II MSc Maths B				12.02.2020
54	M.Muneeswari II MSc Maths A				12.02.2020
55	K.Deepika II MSc Maths A				12.02.2020
56	B.Abranjitha III Bsc Maths A	National Level Talent Fest REPOWIS 2K20	Kongu Engineering College,Perundurai	Women Empowerment	21.02.2020
57	T.Kamali III Bsc Maths A				21.02.2020
58	S.Soundarya II BSc Maths B				21.02.2020
59	S.Rhythi II BSc Maths B				21.02.2020

(ii) Students Participation in Training Program/MTTS and others

S. No	Name & Class	Title of Seminar/ Conference/ Workshop/ Symposium Title of Seminar	Organizer	Date
1	K.Ponramila II MSc Maths B	Eleventh Summer Training Programme in Mathematics	University of Madras, Chennai	08.05.2019 to 28.05.2019
2	S.Janani II BSc Maths A	IWM Workshop held at IISER	Winter School in Mathematics for Young Women	16.12.2019 to 21.12.2019

3	M.Sangavi III BSc Maths B	NHRC Sponsored One Day Basic Training Programme on Human Rights	Sri Vasavi College, Erode	11.01.2020
4	K.P.Ragavi III BSc Maths B	NHRC Sponsored One Day Basic Training Programme on Human Rights	Sri Vasavi College, Erode	11.01.2020
5	E.Dhivya III BSc Maths A	NHRC Sponsored One Day Basic Training Programme on Human Rights	Sri Vasavi College, Erode	11.01.2020
6	G.Kiruthika III BSc Maths A	NHRC Sponsored One Day Basic Training Programme on Human Rights	Sri Vasavi College, Erode	11.01.2020
7	T.Kamali III BSc Maths A	NHRC Sponsored One Day Basic Training Programme on Human Rights	Sri Vasavi College, Erode	11.01.2020

STUDENT ACHIEVEMENTS-OFF CAMPUS

S. No	Name & Class	Event/ Programme	Organizer	Date of the Event	Award / Prize / Position
1	V.Rajeshwari III BSc Maths B	Intercollegiate Meet Mimimg	Sasurie College of Arts and Science,Tirupur	09.08.2019	I
2	M.C.Tharanimathi III BSc Maths B			09.08.2019	I

3	S.Sureka III BSc Maths B			09.08.2019	I
4	J.Viswabharathi III BSc Maths B			09.08.2019	I
5	S.Narmatha III BSc Maths B			09.08.2019	I
6	M.Nazreen Banu III BSc Maths B			09.08.2019	I
7	T.Sriponkaviya III BSc Maths B			09.08.2019	I
8	S.Sujitha III BSc Maths B	Intercollegiate Meet Math Sketching		09.08.2019	II
9	M.Sangavi III BSc Maths B			09.08.2019	II
10	V.Gobika III BSc Maths A	Intercollegiate Meet Math Rangoli		09.08.2019	I
11	M.Anusuya III BSc Maths A			09.08.2019	I
12	E.Malarvizhi III BSc Maths A			09.08.2019	I
13	Y.Nandhini II MSc Maths B	Intercollegiate Meet Mehandhi		09.08.2019	I
14	R.Saranyadevi II MSc Maths B			09.08.2019	I
15	K.S.Mithra III BSc Maths A	Inter Collegiate Tournaments 100 M Butterfly	Bharathiyar University,Coimbatore	17.09.2019	I
16	T.Asmitha Varsha I BSc Maths A	Inter Collegiate Tournaments 50 M Breast Stroke	Bharathiyar University, Coimbatore	17.09.2019	II
17	T.Asmitha Varsha I BSc Maths A	Inter Collegiate Tournaments 100 M Breast Stroke	Bharathiyar University, Coimbatore	17.09.2019	II
18	A.Kiruthika III BSc Maths A	Inter Collegiate Tournaments 200 M Individual medly	Bharathiyar University, Coimbatore	17.09.2019	III

19	A.Kiruthika III BSc Maths A	Inter Collegiate Tournaments 100 M Butterfly	Bharathiyar University, Coimbatore	17.09.2019	II
20	A.Kiruthika III BSc Maths A	Inter Collegiate Tournaments 4*100 M Free Style Relay	Bharathiyar University, Coimbatore	17.09.2019	III
21	S.Sujitha III BSc Maths B	One Day Workshop on Innovation in Mathematics SOLSTICE '19 Math Sketching	Sri Ramakrishna Mission Vidyalaya College of Arts and Science,Coimbatore	06.10.2019	II
22	M.Sangavi III BSc Maths B	One Day Workshop on Innovation in Mathematics SOLSTICE '19 Math Sketching		06.10.2019	II
23	S.Kamali I BSc Maths A	Dance	Vanavil Panbattu Mayam	13.10.2019	I
24	S.Nivedha II MSc Maths B	Solo Singing	Bharathidasan College of Arts and Science,Erode	11.02.2020	III
25	R.A.Jayabashini II BSc Maths A	Cooking Without Fire		11.02.2020	II
26	A.M.Logida II BSc Maths A			11.02.2020	II
27	S.Dharani II MSc Maths A	Math Rangoli		11.02.2020	II
28	M.Dharani Jothi II MSc Maths A			11.02.2020	II
29	S.Narmatha III BSc Maths B	Math Sketching	Erode Arts and Science College,Erode	12.02.2020	I
30	G.Priyanga III BSc Maths B			12.02.2020	I
31	R.A.Jayabashini II BSc Maths A	National Level Talent Fest REPOWIS 2K20	Kongu Engineering College,Perundurai	21.02.2020	II

32	A.M.Logida II BSc Maths A	Treasure Hunt		21.02.2020	II
33	V.Gobika III BSc Maths A			21.02.2020	II
34	K.Kiruthika III BSc Maths A			21.02.2020	II
35	P.Jananipriya III BSc Maths A			21.02.2020	II
36	S.Kirubashini III BSc Maths A			21.02.2020	II
37	R.M.Sivaranjani II BSc Maths B	National Level Talent Fest REPOWIS 2K20 Solo Dance		21.02.2020	I

STUDENT ACHIEVEMENTS-ON CAMPUS

S. No	Name & Class	Event/ Programme	Organizer	Date of the Event	Award / Prize / Position
1	M.Nazreen Banu III BSc Maths B	Math Expo-2019	Vellalar College for Women, Erode	20.12.2019	II
2	E.Sindhuja III BSc Maths B			20.12.2019	II
3	S.Keerthana II BSc Maths A			20.12.2019	III
4	C.Ishwarya			20.12.2019	III

	II BSc Maths A				
5	M.Kiruthika I BSc Maths A			20.12.2019	III
6	N.V.Keerthana I BSc Maths A			20.12.2019	III
7	R.Nivetha I MSc Maths B			20.12.2019	I
8	V.Vikaashini I MSc Maths B			20.12.2019	I
9	A.Kiruthika III BSc Maths A	Annual Sports Day 2019-2020	Vellalar College for Women, Erode	10.02.2020	Best Player of the year Swimming 2017-2020
10	K.S.Mithra III BSc Maths A			10.02.2020	Best Player of the year Swimming 2017-2020
11	R.Vidhya I BSc Maths B	Annual Sports Day- Kho Kho	Vellalar College for Women, Erode	10.02.2020	Winner
12	S.Keerthana II BSc Maths A	Annual Sports Day- Throw Ball		10.02.2020	Runner
13	E.Sindhuja III BSc Maths B	Annual Sports Day- Amusement Game		10.02.2020	II
14	T.Asmitha Varsha I BSc Maths A	Annual Sports Day- 4*50 mts Swimming- relay		10.02.2020	II
15	A.Kiruthika III BSc Maths A	Annual Sports Day- 4*50 mts Swimming- relay	Vellalar College for Women, Erode	10.02.2020	II
16	D.Sowmiya II MSc Maths B	Annual Sports Day- 4*100 mts-relay		10.02.2020	I
17	E.Sindhuja III BSc Maths B	Exercise Dance		10.02.2020	Captain
18	T.Yogalakshmi I BSc Maths B	March Past	Vellalar College for Women, Erode	10.02.2020	I
19	S.Janani II BSc Maths A			10.02.2020	I
20	S.Keerthana II BSc Maths A			10.02.2020	I
21	V.J.Sharmila I BSc Maths B			10.02.2020	I
22	S.Bhuvaneswari II BSc Maths A	Annual Sports Day- Throw Ball	Vellalar College for Women, Erode	10.02.2020	I
23	S.Bhuvaneswari II BSc Maths A	Annual Sports Day- Kho Kho		10.02.2020	Runner

24	S.Bhuvaneswari II BSc Maths A	Annual Sports Day- 4*400 mts-relay		10.02.2020	Winner
25	S.Bhuvaneswari II BSc Maths A	March Past		10.02.2020	I
26	J.K.Jeevitha II BSc Maths A			10.02.2020	I
27	S.Soundharya I BSc Maths B			10.02.2020	I
28	S.Sharikashri I BSc Maths B			10.02.2020	I
29	E.Sineka I BSc Maths B		Vellalar College for Women, Erode	10.02.2020	I
30	M.Shaline II BSc Maths B	March Past	Vellalar College for Women, Erode	10.02.2020	I
31	A.Pavithra II BSc Maths B			10.02.2020	I
32	T.Nivedha II BSc Maths B			10.02.2020	I
33	R.Ramya II BSc Maths B	Annual Sports Day- Kho Kho	Vellalar College for Women, Erode	10.02.2020	Winner
34	Priyanka I BSc Maths B	Annual Sports Day- Throw Ball		10.02.2020	Runner
35	K.A.Sree Vibeshney I BSc Maths B	Annual Sports Day- Throw Ball		10.02.2020	Runner
36	P.Umamaheshwari I BSc Maths B	Annual Sports Day- Throw Ball		10.02.2020	Runner
37	R.Jothika I BSc Maths A	March Past	Vellalar College for Women, Erode	10.02.2020	I
38	M.Pavithra I BSc Maths A			10.02.2020	I
39	S.Gayathri I BSc Maths A			10.02.2020	I
40	S.Gayathri I BSc Maths A	Annual Sports Day- Throw Ball	Vellalar College for Women, Erode	10.02.2020	Runner
41	T.Asmitha Varsha I BSc Maths A	March Past		10.02.2020	I
42	Poorani	Annual Sports		10.02.2020	Runner

	I BSc Maths A	Day- Throw Ball			
43	R.Ramya III BSc Maths B	Video Presentation	Vellalar College for Women,Erode	13.02.2020	II
44	S.D.Sankeerthana III BSc Maths B			13.02.2020	II
45	S.Kanmani III BSc Maths A	Poster Making	Vellalar College for Women, Erode	13.02.2020	III
46	S.Dhivya III BSc Maths A			13.02.2020	III
47	M.Anusuya III BSc Maths A			13.02.2020	I
48	B.Anitha III BSc Maths A			13.02.2020	I
49	T.Kamali III BSc Maths A	Story Telling	Vellalar College for Women, Erode	13.02.2020	I
50	K.Ponramila II MSc Maths B	Besties		25.02.2020	II
51	D.Nikitha II MSc Maths B			25.02.2020	II
52	M.Deepika III BSc Maths A	Dance	Vellalar College for Women, Erode	25.02.2020	II

PLACEMENT DETAILS

We feel proud to convey that our students have been placed in the following reputed Companies

S.No	Name of the Student	Class	Company Name
1	B.Anitha	III-B.Sc., Maths ‘A’	Infosys
2	N.Kanihavishwa	III-B.Sc., Maths ‘A’	Infosys
3	R.Dharanya	III-B.Sc., Maths ‘A’	Infosys
4	T.Kamali	III-B.Sc., Maths ‘A’	Infosys

5	M.Sangavi	III-B.Sc., Maths ‘B’	Infosys
6	K.K.Sowmeya Shree	III-B.Sc., Maths ‘B’	Infosys
7	S.Sivasankari	III-B.Sc., Maths ‘B’	Infosys
8	T.Sabari Ishwarya	III-B.Sc., Maths ‘B’	Infosys
9	P.M.Mouna Malar	III-B.Sc., Maths ‘B’	Infosys
10	S.Preethi	III-B.Sc., Maths ‘B’	Infosys
11	G.Priyanga	III-B.Sc., Maths ‘B’	Infosys
12	C.Vaishnavi	III-B.Sc., Maths ‘B’	Infosys
13	M.Mohamooda Hasmath Naseera	III-B.Sc., Maths ‘A’	Wipro
14	P.A.Janaranjani	III-B.Sc., Maths ‘A’	Wipro
15	P.Kavipriya	III-B.Sc., Maths ‘A’	Wipro
16	M.Deepika	III-B.Sc., Maths ‘A’	Wipro
17	T.S.Vaishnaavi	III-B.Sc., Maths ‘B’	Wipro
18	T.Preethi	III-B.Sc., Maths ‘B’	Wipro
19	N.Kokila	III-B.Sc., Maths ‘B’	CTS
20	A.S.Tharani	III-B.Sc., Maths ‘B’	CTS
21	N.Ramya	III-B.Sc., Maths ‘B’	CTS
22	V.Rajeshwari	III-B.Sc., Maths ‘B’	Hicitizen Imfact

SNAP SHOT

BRIDGE COURSE(24.06.2019)

Bridge Course for the UG first year students on **"Fundamentals of Mathematics"** to fill the hiatus in learning.

WORKSHOP (12.09.2019)

Workshop on **"Problem Solving in Analysis"**by Mr.R.Suresh Kannan.

MATH EXPO-2019 (20.12.2019)

Applications of Mathematics in real life has been exhibited through models at **"Math Expo 2019".**

SPECIAL MEET (11.01.2020)

Special Meetingby Miss.A.Saranyadevi on**Mysteries in Mathematics.**

ONE DAY SEMINAR (24.01.2020)

A tremendous one day seminar on **Applications of Differential Equation**by Dr. A.Vinod Kumar.

EXTENSION ACTIVITY (12.02.2020)

Effective way of learning Mathematicsthrough innovative models to the students of **B.F.G.M Nithiyuthavi Thuvakkappalli, Chinnappuliyur.**

STUDENTS ACHIEVEMENT

Our students achievement at the intercollegiate meet Congro - 2k20 organized by Bharathidasan College of Arts and Science.

ALUMNI MEET

An **Alumni Meet**for the reunion and betterment of the Department.