JAI SHRI KRISHNA

DWARAKA DOSS GOERDHAN DOSS VAISHNAV COLLEGE

DEPARTMENT OF MATHEMATICS

POST GRADUATE AND RESEARCH DEPARTMENT OF MATHEMATICS

PROSPECTUS

2021-2022

CONTENTS

SECRETARY'S MESSAGE

All Our dreams can come true, if we have the courage to pursue them"- Walt Disney

Dreams may seem to be far removed from reality. They may seem impossible and improbable. But little do we realize that all of us have in us the strength, patience and the passion to fulfil our dreams. The vision and dreams of a few kind hearted philanthropists and educationists, led to the founding of this institution. The hard work and perseverance of the successive members of the management and the academicians have enabled the institution emerge as one of the much sought after colleges in the city. It is now our duty and responsibility to carry forward this dream and with steadfast faith and determination redefine the standard of excellence, strengthen the spirit of solidarity and celebrate the power of knowledge to transform the society.

Best wishes

Shri Ashok Kumar Mundra

SECRETARY

PRINCIPAL'S MESSAGE

Greetings!

The meaning of education has transformed greatly in todays technology driven and digitally connected world that we live in, An educator in the present times has to adopt a multi-dimensional approach having knowledge creation, confidence building and honing leadership skills at its core. While many of our students have been greatly contributing to various renowned and reputed organisations as exemplar leaders, the institution and the department also focuses on developing entrepreneurship skills among students so that they would have the courage and conviction to establish an enterprise and create a legacy. The task ahead is clearly defined-educate, enlighten and empower. As Benjamin Franklin said "An investment in Knowledge pays the best interest".

With Best Wishes

Dr S. Santhosh Baboo

PRINCIPAL

About the College:

Dwaraka Doss Goverdhan Doss Vaishnav College, a linguistic minority institution established in the year 1964 with B.Sc. Mathematics as first course. College was founded on the principles of Vaishnavism, with the sole purpose of imparting value-based quality education and empowering the youth. The college has seen a phenomenal growth in terms of its infrastructure and revamped curriculum to cater to the specific needs of the student's community. Outstanding performance of the students in academics and extension activities has enabled the college to emerge one of the premier institutions of higher learning.

About the Department:

In the year of its inception, the college under the stewardship and the Principal of Shri T. Totadri Iyengar, offered an Undergraduate course in Mathematics along with Pre - University courses. The department of Mathematics has been accredited as being the first UG department at the time of inception of the college in 1964. The University of Madras upgraded the department to the postgraduate status in the year 1980. M.Phil. course was started in the year 2001. B.Sc. Mathematics with Computer Applications was started in the year 2011. The Post Graduate and Research Department of Mathematics, DG Vaishnav College, Chennai has been vigorously engaged in both research and teaching. The Department has energetic and dedicated faculty members who actively involve in research areas like Complex Analysis, Number theory, Mathematical Analysis, Fuzzy sets, Fuzzy Optimization, Petrinets, Information Security, Differential equations, Wavelets and Numerical Methods.

Objective:

To Provide graduate students an opportunity to develop a deep understanding and enjoyment of Mathematics, to carry out original resech, to become effective teachers and communicators and to prepare themselves for their future careers.

Mission of the Department

To establish an atmosphere of creative endeavor that supports interdisciplinary collaborations, innovative projects, significant research and informal discussions that mutually benefit students, faculty and the community at large.

Vision of the Department

The vision of the department is to promote and support a comprehensive, innovative and dynamic learning environment. To assist students in acquiring a conceptual understanding of the nature and structure of Mathematics, its processes and applications.

Learning outcome of the programme in Mathematics:

Learning Outcomes of the Undergraduate Program in Mathematics (Shift- I) and Mathematics with Computer Applications (Shift -II):

- Develop broad and balanced knowledge and understanding of definitions, concepts, principles and theorems.
- 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.
- Provide students/learners sufficient knowledge and skills enabling them to undertake further studies in Mathematics and its allied areas on multiple disciplines concerned with Mathematics.
- Communicate mathematical ideas through oral and written presentations.
- Will be able to demonstrate team spirits, skills and values and continue to learn and adapt to change throughout their professional career.
- Use mathematical ideas to model real world problems.

For Post Graduate Course:

Learning Outcomes of the Post Graduate and M.Phil. Program in Mathematics:

- A Post graduate in mathematics not only gains knowledge on the importance of mathematics and is ubiquitous applications but also acquires the following intrinsic abilities.
- Good analytical reasoning.
- Pursue research in their chosen field of Applied or pure mathematics.
- Perseverance and self-confidence by way of practice to solve mathematical problems.

Faculty

S.NO	NAME	DESIGNATION	AREAS OF INTEREST
1.	Prof. R. Venkataramanan Head of the Department	Associate Professor	Algebra , Topology
2.	Prof. M. Devika	Associate Professor	Number Theory and Cryptography, Functional Analysis
3.	Dr. N. JayanthKarthik	Associate Professor	Fuzzy set theory and Graph theory
4.	Dr. R. Sivaraman	Associate Professor	Number Theory
5.	Dr. S. Radhakrishnan	Assistant Professor	Fuzzy Set theory
6.	Dr. B. Abirami	Assistant Professor	Fuzzy Set theory and its Applications
7.	Dr. S.P.Vijayalakshmi	Assistant Professor	Geometric Function Theory
8.	Dr. S. Hariharan	Assistant Professor	Wavelet Analysis, Fuzzy Optimization.
9.	Dr. P.Usha	Assistant Professor	Petri Nets
10.	Dr. S. Vaithyasubramanian	Assistant Professor	Authentication Process- Information Security

11.	Dr. S.Mayilvaganan	Assistant Professor	Geometric Function Theory
12.	Dr. S.U. Malini	Assistant Professor	Fuzzy set Theory
13.	Dr. R. Arundhadhi	Assistant Professor	Graph Theory
14.	Mr. Lt. Somasundara Ori	Assistant Professor	Differential equations
15.	Mr. P.Thirumal	Assistant Professor	Fixed point theory on Metric spaces, Functional Analysis
16.	Mr. Krishna	Assistant Professor	Differential Equations, Topology.
17.	Mr. Rajasekar	Assistant Professor	Linear Algebra, Differential Equation
	Shift -II		
18.	Ms. B. Sangeetha	Assistant Professor	Abstract Algebra
19.	Ms. N. Poornima	Assistant Professor	Fuzzy Sets and its Applications
20.	Ms. C. M. Subalakshmi	Assistant Professor	Geometric Function Theory
22.	Ms. S. Uthra	Assistant Professor	Graph Theory
23.	Ms. J. Kavitha	Assistant Professor	Algebraic structure, Operations Research
24.	Dr. P. Vijayalakshmi	Assistant Professor	Fuzzy graph and Graph Theory

25.	Dr. K.Priyadharshini	Assistant Professor	Algebra, Lie Superalgebra
26.	Mr. C. Sathish	Assistant Professor	Operations Research and Mathematical statistics
27.	Mr. P. Karnan	Assistant Professor	Real analysis, Complex analysis
28.	Mr. M. Hariprasath	Assistant Professor	Algebra, Topology, Analysis
29.	Mr. V. Dhamodharan	Assistant Professor	Linear Algebra and Calculus
30.	Mr. R. Shankar	Assistant Professor	Operations Research and Statistics.
31.	Dr. A. Rajkumar	Assistant Professor	Stochastic process

Research Activities by the Department

The Post Graduate and Research Department of Mathematics, DG Vaishnav College, Chennai has been vigorously engaged in both research and teaching. The Department has energetic and dedicated faculty members who actively involved in research areas like Complex Analysis, Number theory, Mathematical Analysis, Fuzzy sets, Fuzzy Optimization, Petri nets, Information Security, Differential equations, Wavelets and Numerical Methods. Faculties have published many papers in the National and international Journals.

- **Teacher's Circle:**

  The purpose of Teacher's Circle is to have intra and interdisciplinary collaborative research on open problems. The research activities will be discussed on emerging current trends among the Ph.D. scholars of the department to find out the new interdisciplinary or multidisciplinary areas.

Students Activites

➢ Math club- BRAHMAGANITH

Mathematics club named "BRAHMAGANITH". The activities are Workshop, Guest lectures, quiz programme, seminars will be conducted for the students by the students and by the faculties of our department and other experts.

➢ MATHCIPHER

Inter collegiate student's technical and cultural event will be held during the 3rd week of February conducted by PG & Research Department of Mathematics, D G Vaishnav college, Chennai. Technical Fests is an essential part of course curriculum as it gives a platform to young brains to showcase their innovative ideas and compete with their peers. These technical and cultural fests are an amalgamation of fun and learning where spectacular ideas are displayed.

Course Catalogue:

Brief descriptions of the core courses offered by the department to its undergraduate and Post Graduate Majors, allied, elective, extra disciplinary subjects are given below. The detailed syllabi can be viewed on the website.

B.Sc Mathematics (MPC/MAP)(Shift-I)

First Semester

Course Content	Name of the Course	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -I	3	40	60	100
Part - II	English Paper -I	3	40	60	100
Part - III	Core Paper-I: Algebra and Trigonometry	4	40	60	100
	Core Paper-II: Differential Calculus	4	40	60	100
	Allied Paper- I: Physics – I/ Financial Accounting	5	40	60	100
Part - IV	Basic Tamil/Adv. Tamil/Non Major Elective -I	2	40	60	100
	Soft Skills -I	3	50	50	100

Second Semester:

Course Content	Name of the Course	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -II	3	40	60	100
Part - II	English Paper -II	3	40	60	100
Part - III	Core Paper-III: Analytical Geometry	4	40	60	100
	Core Paper-IV: Integral Calculus and Vector Analysis	4	40	60	100
	Allied Paper- II: Physics – II/Cost and Management Accounting	5	40	60	100
Part - IV	Basic Tamil/Adv. Tamil/ Non Major Elective -II	2	40	60	100
	Soft Skills -II	3	50	50	100

THIRD SEMESTER:

Course Content	Name of the Course	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -III	3	40	60	100
Part - II	English Paper -III	3	40	60	100
Part - III	Core Paper-V: Differential Equations	4	40	60	100
	Core Paper-VI: Elementary Number Theory	4	40	60	100
	Allied Paper- III : Chemistry – I/ Probability and statistics- I	5	40	60	100
Part - IV	Environmental Studies		EXAM IN THE IV SEMESTER		
	Soft Skills -III	3	50	50	100
	Extra-Disciplinary paper	2			

FOURTH SEMESTER

Course Content	Name of the Course	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -IV	3	40	60	100
Part - II	English Paper -IV	3	40	60	100
Part - III	Core Paper-VII: Integral Transform	4	40	60	100
	Core Paper-VIII: Discrete Mathematics	4	40	60	100
	Allied Paper- IV : Chemistry – II/ Mathematical Statistics	5	40	60	100
	Internship	2			
Part - IV	Environmental Studies	2	40	60	100
	Soft Skills -IV	3	50	50	100
	Extra Disciplinary paper	2			
	Value Added Course	2			

FIFTH SEMESTER:

Course Content	Name of the Course	Credits	Int. Marks	Ext.Marks	Total
Part - III	Core Paper-IX: Algebraic Structures	4	40	60	100
	Core Paper -X: Real Analysis-I	4	40	60	100
	Core Paper-XI: Mechanics	4	40	60	100
	Core Paper – XII: Operations Research	4	40	60	100
	Elective Paper -I: Programming Language Python With Practicals	5	40	60	100
	Project	2			
Part - IV	Value Education	2	40	60	100
	Value Added Course	2			

SIXTH SEMESTER:

Course Content	Name of the Course	Credits	Int. Marks	Ext.Marks	Total
Part - III	Core Paper-XIII: Linear Algebra	4	40	60	100
	Core Paper -XIV: Real Analysis-II	4	40	60	100
	Core Paper-XV: Functions of a Complex variable	4	40	60	100
	Elective Paper -II: Machine learning using R	5	40	60	100
	Elective Paper -III: Tropical Linear Algebra	5	40	60	100
Part – V	Extension Activity	1			

Extra Disciplinary papers:

Predictive Modelling using R

Numerical methods

Value Added Course:

Data Analytics

LaTeX

Neural Networks and Algorithms

B.Sc Mathematics with Computer Applications (Shif -II)

First Semester

Course Content	Name of the Course	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -I	3	40	60	100
Part - II	English Paper -I	3	40	60	100
Part - III	Core Paper-I: Algebra and Trigonometry	4	40	60	100
	Core Paper-II: Differential Calculus	4	40	60	100
	Core Paper-III : Python Programming	4	40	60	100
	Core Paper-IV : Python Programming lab	4	40	60	100
Part - IV	Basic Tamil/Adv. Tamil/Non Major Elective -I	2	40	60	100
	Soft Skills -I	3	50	50	100

Second Semester:

Course Content	Name of the Course	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -II	3	40	60	100
Part - II	English Paper -II	3	40	60	100
Part - III	Core Paper-V: Analytical Geometry	4	40	60	100
	Core Paper-VI: Integral Calculus and Vector Analysis	4	40	60	100
	Core Paper – VII: Java and Data Structures	4	40	60	100
	Core Paper – VIII: Data Structure using Java - lab	4	40	60	100
Part - IV	Basic Tamil/Adv. Tamil/ Non Major Elective -II	2	40	60	100
	Soft Skills -II	3	50	50	100

THIRD SEMESTER:

Course Content	Name of the Course	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -III	3	40	60	100
Part - II	English Paper -III	3	40	60	100
Part - III	Core Paper- IX: Differential Equations	4	40	60	100
	Core Paper- X: Operating Systems	4	40	60	100
	Allied Paper- I Probability and Statistics- I	5	40	60	100
Part - IV	Environmental Studies		EXAM IN THE IV SEMESTER		
	Soft Skills -III	3	50	50	100
	Extra Disciplinary paper	2			

FOURTH SEMESTER

Course Content	Name of the Course	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -IV	3	40	60	100
Part - II	English Paper -IV	3	40	60	100
Part - III	Core Paper-XI: Integral Transform	4	40	60	100
	Core Paper-XII: Discrete Mathematics	4	40	60	100
	Allied Paper- II: Probability and Statistics- II	5	40	60	100
	Internship	2			
Part - IV	Environmental Studies	2	40	60	100
	Soft Skills -IV	3	50	50	100
	Extra Disciplinary paper	2			
	Value added course	2			

FIFTH SEMESTER:

Course Content	Name of the Course	Credits	Int. Marks	Ext.Marks	Total
Part - III	Core Paper-XIII: Algebraic Structures	4	40	60	100
	Core Paper -XIV: Real Analysis-I	4	40	60	100
	Core Paper-XV: Mechanics	4	40	60	100
	Core Paper – XVI: Operations Research	4	40	60	100
	Core Paper -XVII: Web Technology	4	40	60	100
	Core Paper -XVIII: Web Technology- Lab	4	40	60	100
	Project	2			
Part - IV	Value Education	2	40	60	100
	Value added course	2			

SIXTH SEMESTER:

Course Content	Name of the Course	Credits	Int. Marks	Ext.Marks	Total
Part - III	Core Paper-IXX: Linear Algebra	4	40	60	100
	Core Paper -XX: Real Analysis-II	4	40	60	100
	Core Paper-XXI: Functions of a Complex variable	4	40	60	100
	Core Paper - XXII: Machine learning using R (with Practicals)	5	40	60	100
	Core Paper – XXIII: Open Source Technologies	5	40	60	100
	Core Paper – XXIV: Open Source Technologies-Lab	5	40	60	100
Part – V	Extension Activity	1			

Extra Disciplinary papers:

Numerical methods

Financial mathematics Using R

Value Added Course:

Data Analytics

LaTeX

Neural Networks and Algorithm

M.Sc Mathematics

Curriculum and scheme of Examination under CBCS and OBE pattern
(Applicable to the students admitted during the Academic Year 2021-2022 and Onwards)

Semester	Subject Code	Title of the Paper	Instruction hours/cycle	Exam. Marks			Duration of Exam (hours)	Credits
				CIA	ESE	TOTAL		
I	2121101	Core Paper I Abstract Algebra	6	40	60	100	3	4
	2121102	Core Paper II Real Analysis I	6	40	60	100	3	4
	2121103	Core Paper III Ordinary Differential Equations	6	40	60	100	3	4
	2121104	Core Paper IV Graph theory	6	40	60	100	3	4
	2121105	Elective I – Paper V Formal Languages and Automata Theory	4	40	60	100	3	3
	2150101	Soft Skills - I	2	50	50	100	3	2
	Total		**30**	**-**	**-**	**600**	**-**	**21**
II	2121207	Core Paper VI Linear Algebra	6	40	60	100	3	4
	2121208	Core Paper VII Real Analysis II	6	40	60	100	3	4
	2121209	Core Paper VIII Partial Differential Equations	6	40	60	100	3	4
	2121210	Core Paper IX Probability Theory	6	40	60	100	3	4
	2121211	Elective II – Paper X Wavelets	4	40	60	100	3	3
		Extra Disciplinary II Data Structure and Algorithms	4	40	60	100	3	3
		Internship	-	-	-	-	-	2
	2150201	Soft Skills - II	2	50	50	100	3	2
		Value added course						2
		Total	**30**	**-**	**-**	**600**	**-**	**28**

III	2121313	Core Paper XI Complex Analysis - I	5	40	60	100	3	4
	2121314	Core Paper XII Topology	5	40	60	100	3	4
	2121315	Core Paper XIII Mechanics	5	40	60	100	3	4
	2121316	Core Paper XIV Operations Research	5	40	60	100	3	4
	2121317	Elective III – Paper XV Number Theory and Cryptography	4	40	60	100	3	3
	2121318	Extra Disciplinary I Mathematical Economics	4	40	60	100	3	3
	2160301	Project	-	-	-	-	-	2
	2150301	Soft Skills III	2	50	50	100	3	2
		Value added course						2
	Total		**30**	**-**	**-**	**700**	**-**	**28**
IV	2121419	Core Paper XVI Complex Analysis - II	5	40	60	100	3	4
	2121420	Core Paper XVII Functional Analysis	5	40	60	100	3	4
	2121421	Core Paper XVIII Differential Geometry	5	40	60	100	3	4
	2121422	Elective IV – Paper XIX Fluid Dynamics	5	40	60	100	3	3
	2121423	Elective V – Paper XX Financial Mathematics	4	40	60	100	3	3
	2150401	Soft skills IV	2	50	50	100	3	2
	Total		**30**	**-**	**-**	**700**	**-**	**20**
Grand Total			120			**2600**	**-**	**97**

Elective Papers

1. Formal Languages and Automata Theory
2. Wavelets
3. Number Theory and Cryptography
4. Fluid Dynamics
5. Financial Mathematics.

Extra Disciplinary Papers

1. Mathematical Economics
2. Data Structure and Algorithms.

Certificate Courses

1. Cyber Security
2. Image processor with open CV
3. Fuzzy sets its applications

Degree Structures:

As per the guidelines given by the University Grants Commission and the Tamil Nadu State Council for Higher Education B.Sc and M. Sc degree programme is designed in such a way that it has an extensive applications in both pure and applied Mathematics; an attitude towards problem formulation and solving; an analytical skill and accuracy; an appreciation of the approaching of mathematical techniques and research aptitude to mathematics.

The candidate shall be eligible for the award of **B.Sc Mathematics degree** only if she has undergone the prescribed course of study for a period of not less than Three academic years, passed the examinations of all the six semesters prescribed, minimum earning of 141 credits (completing course and allied subjects are mandatory).

The candidate shall be eligible for the award of **B.Sc Mathematics with Computer Applications degree** only if she has undergone the prescribed course of study for a period of not less than Three academic years, passed the examinations of all the six semesters prescribed, minimum earning of 154 credits (completing course and allied subjects are mandatory).

Tally Table (B.Sc Mathematics)

Subject	No. of Subjects	Total Marks	credits
Core – Theory Papers	15	1500	60
Elective Papers	3	300	15
Allied Papers	4	400	20
Language	4	400	12
English	4	400	12
Soft skills	4	400	12
Non Major electives/ Basic Tamil	2	200	4
Environmental Science	1	100	2
Value Education	1	100	2
Extension Activity	1	100	1
Internship	1		2
Project	1		2
Value added course	2		4
Grand Total	39	3900	148

Tally Table: (B.Sc Mathematics with Computer Applications)

Subject	No. of Subjects	Total Marks	credits
Core – Theory Papers	24	2400	99
Allied Papers	2	200	10
Language	4	400	12
English	4	400	12
Soft skills	4	400	12
Non Major electives/ Basic Tamil	2	200	4
Environmental Science	1	100	2
Value Education	1	100	2
Extension Activity	1	100	1
Internship	1		2
Project	1		2
Value added course	2		4
Grand Total	39	3900	162

- 40 % CIA is applicable to all subjects except JOC, COP and SWAYAM courses which are considered as extra credit courses.
- The students are advised to complete a **SWAYAM-MOOC** before the completion of the 4th semester and the course completed certificate should be submitted to the HOD. Two credits will be given to the candidates who have successfully completed.
- A **Field Trip** preferably relevant to the course should be undertaken every year.

The candidate shall be eligible for the award of **M.Sc degree** only if she has undergone the prescribed course of study for a period of not less than two academic years, passed the examinations of all the four semesters prescribed, minimum earning of 91 credits (completing course, elective and extra disciplinary subjects are mandatory).

Tally Table:

Subject	No. of Subjects	Total Marks	Credits
Core – Theory	15	1500	60
Major Elective Papers	5	500	15
Extra Disciplinary	2	200	6
Soft Skills	4	400	8
Internship	1	-	2
Project	1		2
Value added courses	2		4
Grand Total	**27**	**2600**	**97**

- 40 % CIA is applicable to all subjects except JOC, COP and SWAYAM courses which are considered as extra credit courses.
- The students are advised to complete a SWAYAM-MOOC before the completion of the 2nd semester and the course completed certificate should be submitted to the HOD. Two credits will be given to the candidates who have successfully completed.
- A Field Trip preferably relevant to the course should be undertaken every year.

Career Development:

The Placement cell has been established with the aim of ensuring job opportunities to the students. Reputed IT companies and MNC's come for direct recruitment. It also provides information regarding centers of Excellence in higher education in India and Abroad. The main objectives of the placement cell.

- To enhance the Employability skills and provide career guidance for the students
- Providing comprehensive training program from first year onwards to cater the individual needs of the students.
- Providing value based training programs and Technical certification courses with leading training partners.
- Make them to understand the industry demands and provide the necessary skill based training programs to meet the expectation of the industry.
- Motivate the students to become a job providers than job seekers by conducting Entrepreneurship development program
- Strengthening the industrial institutional interactions and Network with Alumni members.
- Conducting both workshops, Guest Lectures, Motivational sessions, career Guidance Programmes to overcome challenges.

Highlights of the Department

The Department is conducting the following events periodically to enhance the knowledge of students as well as faculties in emerging fields of research.

- Series of Webinars on all Saturdays
- National Conferences twice in a year
- Faculty Development Programme twice in a Year.
- Student activities under BRAHMAGANITH- Mathematics club.
- Mathcipher- Annual intercollegiate students technical and cultural fest.
- Release of Proceedings of the conferences.
- C^4 – Chase, Crack, Conquer, CSIR- NET - free online coaching class for NET aspirants of Mathematical Sciences.
- Release of Annual Newsletter- Mathphile.

Counselling Cell:

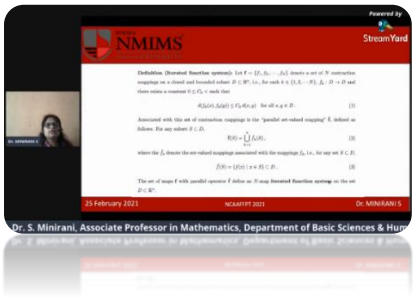
To address the problems (both personal and academic) faced by the students, counsellor has been appointed by the college to offer support and guidance thereby enhance their self-esteem.

Merit Scholarships:

Understanding the need for recognition and appreciation, the management encourages high achievers by awarding scholarship to students who have excelled in academics, arts and cultural activities. Students can apply for the same with the recommendations of the heads of the respective departments.

College Hostel:

Seth Purushotham Doss Gokul Doss Hostel started functioning in 1965. It is an extended home which nurtures the spirit of academic excellence as well as camaraderie and compassion. A recreation Hall with facility for playing indoor games ensures their physical and psychological well being. It helps them emerge as men with both professional expertise and humane understanding. Many students are given accommodation with a mess providing pure vegetarian wholesome food.



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