



Tranquebar Bishop Manikam Lutheran College (TELIC)
Porayar 609307, Mayiladuthurai District, Tamil Nadu, India

CERTIFICATE

This is to certify that **Ms.R. Bhavadharani**, a Full Time Research Scholar, Department of Mathematics, T.B.M.L College, Porayar, has received the **Adi Dravidar Welfare Ph.D. Scheme – Scholarship**, a sum of Rupees **Rs.1,00,000/-** from Directorate of ADW, Government of Tamilnadu for the academic year 2022-2023.

TRANQUEBAR BISHOP MANIKAM LUTHERAN COLLEGE
PORAYAR
MAYILADUTHURAI DISTRICT
TAMIL NADU

R. Irene Hepzibah
9/09/2024.

(Dr. R. Irene Hepzibah)

Dr.R. IRENE HEPZIBAH, M.Sc., M.Phil., Ph.D.,
Assistant Professor & Research Advisor,
PG & Research Department of Mathematics,
T.B.M.L College, Porayar - 609 307
Mayiladuthurai District, Tamilnadu, India.

Generally used abbreviations

a/c = Account	dep = Deposit	Pr = Principal
adj = Adjustment	Dft = Draft	proc = Processing C
Amt = Amount	dish/dsh = Dishonour	rd = Recurring Depo
Ar = Arrear	DR = Debit	ret/rtn = Return
bal = Balance *	DoB = Date of Birth	Rnd = Round of
Capn = Capitalization	eft = Electronic Fund Transfer	sb = Savings Bank
chg/ch = Charge	Inop = Inoperative	SC = Short Credit
chq = Cheque	ins = Insurance	SI/So/SORD = Stan
Clos = Closure	int/in = Interest	S/D/W/H/o = Son/D
coll = Collection	lon/n = Loan	tr/trf/xfer = Transfer
comm = Commission	min = Minimum	TT = Telegraphic Tr
COR/CORR = Correction	os = Outstanding	txn = Transaction
CR = Credit	P & T = Postage & Telegram	Wdl = Withdrawal
cash = Cash	Pos = Point of sale	+ MOD bal=total balance (SB+linked MOD a/c)



State Bank of India

भारतीय स्टेट बैंक

State Bank of India

Savings Bank Account
 CIF No : 87288757501
 Account No : 33722369701
 Customer Name: Ms. BHAVADHARANI R

KATTUMANNARKOIL
 NO. 2, CHETTY STREET

S/D/W/H/o: RAVICHANDIRAN
 Address: 14,
 JEYARAM NAGAR
 KATTUMANNARKOIL

Phone: 262073
 Email: sbi.03833@sbi.co.in
 Branch Code: 3833
 Date of Issue: 14/03/2014

Phone:
 Email:
 D.O.B. (If Minor): 31/05/2000
 MOP.: FIRST
 Nom. Reg. No.:

HELP LINE 1800-11-22-11
 18004253800

14/03/2014 7553072 3833
 IFSC: SBIN0003833
 Branch Manager

[Signature]
 Branch Manager
 Kattumannarkoil

DATE	PARTICULARS	CHEQUE NO.	DEBIT	CREDIT	BALANCE
				Brought Forward	381.36 CR
20.10.20	AT 03833 KATTUMANNARKOIL CASH WITHDRAWAL SELF		100.00		281.36 CR
31.10.20	AT 03833 KATTUMANNARKOIL UPI/DR/030521770628/Mr. Siva/IDIB/sivane 099201162092		100.00		181.36 CR
31.10.20	AT 03833 KATTUMANNARKOIL UPI/CR/030521777200/Mr Sivan/IDIB/sivane 099197162096			100.00	281.36 CR
31.10.20	AT 03833 KATTUMANNARKOIL UPI/DR/030522876991/Mr. Siva/IDIB/sivane 099058162092		150.00		131.36 CR
31.10.20	AT 03833 KATTUMANNARKOIL UPI/CR/030522868070/Mr Sivan/IDIB/sivane			100.00	231.36 CR

	099220162091				
31.10.20	AT 03833 KATTUMANNARKOIL UPI/DR/030522937021/Mr. Siva/IDIB/sivane 098019162099		100.00		131.36 CR
25.12.20	AT 03833 KATTUMANNARKOIL INTEREST CREDIT			1.00	132.36 CR
25.03.21	INTEREST CREDIT			1.00	133.36 CR
25.06.21	INTEREST CREDIT			1.00	134.36 CR
25.09.21	INTEREST CREDIT			1.00	135.36 CR
12.11.21	ATM PENDING AMC				0.00 CR
29.03.23	NETT RB1009237934475 RB150GOTMCP			100000.00	100000.00 CR
29.03.23	GOVT OF TAMILNAD ATM PENDING AMC				0.00 CR
	Uncl Sal: 0.00	Clr Bal: 99840.36	0.64	0.00	99840.36 CR
				Carried Forward	99840.36 CR

இணைப்பு

2022-2023 ஆம் ஆண்டில் முழுநேர முனைவர் பட்டப் படிப்புப் பரீட்சை
ஆதிதிராவிடர் பழங்குடியினர் மற்றும் மதம் மாறிய கிறித்துவ ஆதிதிராவிடர் இன
மாணாக்கர்களுக்கு ஊக்கத் தொகை பெறுவதற்கான விண்ணப்பப் படிவும்.

(தகுதியுள்ளதை டிக் செய்யவும்)

புதியது

புதுப்பித்தல்



PRINCIPAL
T.M.L. COLLEGE
PORAJAR - 609 307.

ஏற்கனவே இக்கல்வி ஊக்கத் தொகை பெற்றுள்ளீரா ஆம் எனில் எந்தெந்த ஆண்டு ✓ செய்யவும்		ஆம் / இல்லை	
		2016-2017	<input type="checkbox"/>
		2017-2018	<input type="checkbox"/>
		2018-2019	<input type="checkbox"/>
		2019-2020	<input type="checkbox"/>
		2020-2021	<input type="checkbox"/>
		2021-2022	<input type="checkbox"/>
1	மாணவர் பெயர்	தமிழ்	ர. பவநாதாரணி ✓
		ஆங்கிலம்	R. Bhavadharani
2	பாலினம் ✓ செய்யவும்	ஆண் <input type="checkbox"/>	பெண் <input checked="" type="checkbox"/> ✓
		மூன்றாம் பாலினத்தார்	<input type="checkbox"/>
3	பிறந்த தேதி	நாள்	மாதம்
		3	1
		0	5
		2	0
		0	0

4	இனம் ✓ செய்யவும்	ஆதிதிராவிடர் (SC) <input checked="" type="checkbox"/>	பழங்குடியினர் (ST) <input type="checkbox"/>	மதம் மாறிய கிறித்தவ <input type="checkbox"/>	ஆதிதிராவிடர் (SCC) <input type="checkbox"/>
சாதி உட்பிரிவு (சான்றொப்பமிடப்பட்ட சான்றிதழ் நகல் இணைக்கப்படவேண்டும்)					
5	சாதிச் சான்றிதழ் எண்				
6	பெற்றோர் பெயர்	தந்தை	உ. ரவிசீமந்திரன் ✓		
		தாய்	ர. சௌரா ✓		
7	நிரந்தர முகவரி				
	கதவு எண் மற்றும் தெருவின் பெயர்	47, ரெய்நாமி நகர் ✓			
	கிராமம்/நகரப் பெயர்	உடையார்பேட்டை ✓			
	வட்டப்பெயர்	காமநாமணினார்பேட்டையில் ✓			
	மாவட்டப்பெயர்	கடலூர் ✓			
	அஞ்சல் குறியீட்டு எண்	608301 ✓			
	தொலைபேசி எண்	9360682989 ✓			
	மின்னஞ்சல் முகவரி	bhavadharanir31@gmail.com ✓			
8	தற்போதைய முகவரி அஞ்சல் குறியீட்டுடன்	47, ரெய்நாமி நகர், உடையார்பேட்டை, காமநாமணினார்பேட்டையில், கடலூர் - 608301 ✓			
9	குடும்ப ஆண்டு வருமானம் (விண்ணப்ப நாளில் செல்பந்தக்க அசல் சான்றிதழ் இணைக்கப்பட வேண்டும்)	72,000 ✓			
	வருமானச் சான்றிதழ் எண்	TN-4202206065396 ✓			
10	முதுகலைப்பட்டம்				

	(M.Sc / M.A / ME / MLIS, etc)	M.Sc ✓
	பாடப்பிரிவு (Tamil / English / chemistry, etc.)	Mathematics ✓
11	முதுகலைப்பட்டத்தில் பயின்ற பாடங்கள் (மதிப்பெண் பட்டியலின் படி அனைத்து பாடங்களுக்கும் கீடுபடாமல் பாடவாரியாக மதிப்பெண்கள் குறிப்பிடப்பட வேண்டும்)	மதிப்பெண்கள்
	Abstract Algebra	85 ✓
	Real Analysis	89 ✓
	Mechanics	93 ✓
	Differential Equations	93 ✓
	Fuzzy sets and its Applications	96 ✓
	Advanced Algebra	91 ✓
	Complex Analysis	91 ✓
	Topology	85 ✓
	probability and statistics	79 ✓
	civil service examination and personality development	73 ✓
	Measure and integration	94 ✓
	Functional Analysis	89 ✓
	programming in C++	93 ✓
	Practical - programming in C++	98 ✓
	Graph theory	94 ✓
	Herbal medicine	77 ✓
	Differential Geometry	86 ✓
	stochastic process	83 ✓
	Integral equations	93 ✓
	operations Research	75 ✓

		சுடுதல்	
15	ஆய்வியல் நிறைஞர் பட்டப் படிப்பில் தேர்ச்சி விழுக்காடு (துல்லியமாக குறிப்பிடப்பட வேண்டும்)		%
16	ஆய்வியல் நிறைஞர் பட்டப் படிப்பு சான்றொப்பமிடப்பட்ட மதிப்பெண் சான்றிதழ் நகல் இணைக்கப்படவேண்டும்		
17	முனைவர் பட்டம் கல்வி பயில எக்கல்வி தகுதியினை அடிப்படையாகக் கொண்டு சேர்க்கை பெற்றுள்ளீர் ✓ செய்யவும்	முதுகலை	✓
		ஆய்வியல் நிறைஞர்	
18	முனைவர் பட்ட படிப்பு அறுதியிடப்பட்ட அதிகபட்ச மொத்த கால அளவு, பல்கலைக் கழக அனுமதிக்க கடிதத்தில் குறிப்பிட்டுள்ளவாறு ✓ செய்யவும்	இரண்டாண்டுகள்	
		மூன்றாண்டுகள்	✓
		நான்காண்டுகள்	
		ஐந்தாண்டுகள்	
		ஆறாண்டுகள்	
19	தற்போது முனைவர் பட்டம் பயிலும் கல்வியாண்டு (2022-2023) ✓ செய்யவும்	முதலாமாண்டு	✓
		இரண்டாமாண்டு	
		மூன்றாமாண்டு	
		நான்காமாண்டு	
		ஐந்தாமாண்டு	
		ஆறாமாண்டு	
20	முனைவர் பட்டப் படிப்பு மேற்கொள்ளும் கல்வி நிறுவனத்தின் பெயர் மற்றும் முகவரி	தீ. இய. டாக. டி. கல்யாணி, பெங்களூர் - 609 307	
21	முனைவர் பட்டப் படிப்புக்கு அங்கீகாரம் வழங்கும் பல்கலைக் கழகத்தின் பெயர் மற்றும் முகவரி	அண்ணாமலை பல்கலைக்கழகம், அண்ணாமலை நகர், சிதம்பரம் - 608 002	

22	<p>முனைவர் பட்டப் படிப்புப் பயில பஸ்கலைக் கழகத்தால் ஆராய்ச்சிக் காலம் குறிப்பிடப்பட்ட அனுமதிக் கடிதம் இணைக்கப்பட்டுள்ளதா?</p> <p>(இல்லையெனில் விரிண்ப்பம் நிராகரிக்கப்படும்) எக்காரணத்தைக் கொண்டும் Bonafide Certificate ஏற்றுக் கொள்ளப்பட மாட்டாது.</p>	ஆம்	
23	<p>மாணவரது சேமிப்புக் கணக்கு விவரம் (மாணவரின் வங்கி சேமிப்பு கணக்கு புத்தகத்தின் முதல் பக்க IFSC, MICR தெளிவான நகலுடன் இணைக்கப்பட வேண்டும்)</p> <p>அ) சேமிப்புக் கணக்கு எண்</p> <p>ஆ) வங்கியின் பெயர் மற்றும் கிளை முகவரியுடன்</p> <p>இ) IFSC குறியீட்டு எண்</p> <p>ஈ) MICR குறியீட்டு எண்</p>	<p>இல்லை [Admission card to Ph.D programme is enclosed]</p> <p>33722369701 ✓</p> <p>STATE BANK OF INDIA, KATTUMANNARKOIL</p> <p>SBIN0003833 ✓</p> <p>605002038 ✓</p>	✓
24	<p>ஆதார் எண் (கட்டாயம் குறிப்பிட வேண்டும் மற்றும் நகல் இணைக்கப்பட வேண்டும்)</p>	5124 0565 0077 ✓	✓
25	<p>இரண்டாமாண்டு / மூன்றாமாண்டு / நான்காமாண்டு / ஐந்தாமாண்டு மற்றும் ஆறாமாண்டு மாணவர்களாயின்</p>	ஆம்	

<p>வழிகாட்டியின் குறிப்புரை மற்றும் பரிந்துரை கடிதம் தனியே இணைக்கப்பட வேண்டும் . அதில் மாணாக்கரின் கல்வி முன்னேற்றம் குறித்த குறிப்பு இடம் பெற வேண்டும். கடித நகல் இணைக்கப்பட்டுள்ளதா?</p>	<p>இல்லை</p>	<p>✓</p>
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சான்று

இவ்விண்ணப்பத்தில் குறிப்பிடப்பட்டுள்ள அனைத்து விவரங்களும் சரியானவை எனவும் உண்மையானவை எனவும் உறுதியளிக்கிறேன். என்னால் அளிக்கப்பட்ட மேற்கண்ட விவரங்கள் பின்னாளில் தவறு என கண்டறியப்பட்டால் எனக்கு ஒப்பளிக்கப்படும் கல்வி ஊக்கத் தொகை முழுவதையும் அரசுக்கு எவ்வழியிலும் திருப்பிச் செலுத்த உறுதியளிக்கிறேன். முழுமையாக பூர்த்தி செய்யப்படாத விண்ணப்பம் நிராகரிக்கப்படும் என்பதையும் ஏற்கிறேன்.

நாள்: 17-03-2023 ✓

R. Bhadraraj
மாணவரது கையொப்பம்

நாள்: 17/03/2023 ✓

R. Irene Hepzibah
17/03/2023
வழிகாட்டியின் கையொப்பம்

Dr. IRENE HEPZIBAH, M.Sc., M.Phil., Ph.d.,
Assistant Professor & Research Advisor,
PG & Research Department of Mathematics,
T.B.M.L. College, Porayar-609 307,
Mayiladuthurai District, Tamilnadu, India.

கல்வி நிலையத் தலைவரால் பூர்த்தி செய்யப்பட வேண்டியது
TO BE FILLED BY THE HEAD OF THE INSTITUTION

1	கல்லூரியின் வகைப்பாடு	மத்திய அரசு கல்லூரி	
		மாநில அரசு கல்லூரி	
		அரசு உதவி பெறும் கல்லூரி	✓
		சுயநிதி கல்லூரி	
		தன்னாட்சி கல்லூரி	
		நிகர்நிலைப் பல்கலைக்கழகம்	
		2	கல்வி நிலையத்தின் பெயர் மற்றும் முழுமையான முகவரி
3	மாணாக்கரின் பெயர்	ர. பஞ்சாரசி	
4	மாணவரது குடும்ப ஆண்டு வருமானம் (விண்ணப்ப நாளில் ஓராண்டு காலத்திற்குள் பெறப்பட்ட அசல் சான்றிதழ் இணைக்கப்பட வேண்டும்)	Rs. 72,000 /-	
5	மாணவரின் முதுகலைப் பட்டப் படிப்பில் தேர்ச்சி விழுக்காடு (துல்லியமாக குறிப்பிடப்பட வேண்டும்)	87.90 %	
6	மாணவரின் ஆய்வியல் நிறைஞர் பட்டப் படிப்பில் தேர்ச்சி விழுக்காடு (துல்லியமாக குறிப்பிடப்பட வேண்டும்)	-	
7	மாணவர் முனைவர் பட்டப் படிப்பு பயில எக்கல்வி தகுதியினை அடிப்படையாகக் கொண்டு சேர்க்கை பெற்றுள்ளார் ✓ செய்யவும்	முதுகலை	✓
		ஆய்வியல் நிறைஞர்	
8	மாணாக்கர் கல்வி பயிலும் முறை ✓ செய்யவும்	முழுநேரம்	✓
		பகுதி நேரம்	
9	மாணவர் முனைவர் பட்டப் படிப்பு பயில தேர்வு செய்துள்ள ஆராய்ச்சியின் தலைப்பு	A STUDY ON RETRAIL QUEVEING SYSTEMS IN UNCERTAIN ENVIRONMENT	

10	மாணாக்கருக்கு முனைவர் பட்டப் படிப்பு பயில பல்கலைக் கழகம் அனுமதித்துள்ள அதிகபட்ச மொத்த கால அளவு	இரண்டாண்டுகள்					
		மூன்றாண்டுகள்			✓		
		நான்காண்டுகள்					
		ஐந்தாண்டுகள்					
		ஆறாண்டுகள்					
11	கல்வி கால அளவு தொடங்கிய நாள் (பல்கலைக்கழக அனுமதிக்கடிதத்தில் உள்ளவாறு)	நாள்	மாதம்	வருடம்			
		0	9	0	3	2	0
12	கால அளவு முடியும் நாள் (பல்கலைக் கழக அனுமதிக்கடிதத்தில் உள்ளவாறு)	நாள்	மாதம்	வருடம்			

கல்வி நிறுவனத் தலைவர் மற்றும் பல்கலைக்கழக பதிவாளரின்
பரிந்துரைக்கும் சான்று

மாணவர் சார்பாக மேலே பூர்த்தி செய்யப்பட்ட விவரங்கள் அனைத்தும் சரியானவை
என்று உறுதி கூறுகிறேன். மேலும் மாணவருக்கு கல்வி ஊக்கத் தொகை வழங்க பரிந்துரை
செய்கிறேன்.

நாள்:



பல்கலைக்கழக பதிவாளரின் கையொப்பம்
பெயர் மற்றும் அலுவலக முத்திரையுடன்.

கல்வி நிறுவன முதல்வரது கையொப்பம்.
பெயர் மற்றும் அலுவலக முத்திரையுடன்.

Dr. GENE GEORGE, M.Sc., M.Phil., Ph.D.,
PRINCIPAL
TBML COLLEGE
PORAYAR - 609 307,
TRANQUEBAR, NAGAR, T.N.

May, k. d. v. n. D. S.

REGISTRAR
Annamalai University



23.1.23

ஓம்/த.ஆனந்த்,

ஆதிதிராவிடர் நல இயக்குநர்.

ஆதிதிராவிடர் நல இயக்குநருக்காக.

Generally used abbreviations

a/c = Account	dep = Deposit	Pr = Principal
adj = Adjustment	Dft = Draft	proc = Processing C
Amt = Amount	dish/dsh = Dishonour	rd = Recurring Depc
Ar = Arrear	DR = Debit	rel/rtn = Return
bal = Balance	DoB = Date of Birth	Rnd = Round of
Capn = Capitalization	eft = Electronic Fund Transfer	sb = Savings Bank
chg/ch = Charge	Inop = Inoperative	SC = Short Credit
chq = Cheque	ins = Insurance	SI/So/SORD = Stan
Clos = Closure	int/in = Interest	S/D/W/H/o = Son/Da
coll = Collection	lon/n = Loan	tr/trf/xfer = Transfer
comm = Commission	min = Minimum	TT = Telegraphic Tr
COR/CORR = Correction	os = Outstanding	txn = Transaction
CR = Credit	P & T = Postage & Telegram	Wdl = Withdrawal
csh = Cash	Pos = Point of sale	+ MOD bal=total balance (SB+linked MOD a/c)



State Bank of India

भारतीय स्टेट बैंक

State Bank of India

Savings Bank Account
 CIF No : 87288757501
 Account No : 33722369701
 Customer Name: Ms. BHAVADHARANI R

KATTUMANNARKOIL
 NO. 2, CHETTY STREET

S/D/W/H/o: RAVICHANDIRAN
 Address: 14,
 JEYARAM NAGAR
 KATTUMANNARKOIL

Phone: 262073
 Email: sbi.03833@sbi.co.in
 Branch Code: 3833
 Date of Issue: 14/03/2014

Phone:
 Email:
 D.O.B. (If Minor): 31/05/2000
 MOP.: FIRST
 Nom. Reg. No.:

HELP LINE 1800-11-22-11
 FOR STATE BANK OF INDIA

14/03/2014 7553072 3833
 IFSC: SBIN0003833

[Signature]
 Branch Manager
 Kattumannarkoil

A/C NO : 33722369701
 IFSC NO : SBIN0003833
 MICR NO : 605002038

ATTESTED

 PRINCIPAL,
 T B. M. L. COLLEGE,
 PORAYAR - 609 307.



A.V.C. College (Autonomous)

NAAC Reaccredited 'A+' Grade (CGPA = 3.46/4.00) in 4th Cycle
NIRF All India Ranking 2022: College Rank Band: 101-150
UGC Recognized "College with Potential for Excellence - Phase I & II"
Mannampandal, Mayiladuthurai - 609 305.



TRANSFER & CONDUCT CERTIFICATE

ADMISSION. NO. : 998 / 2020 - 21

TC NO: 1031

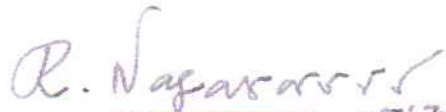

REGISTER. NO. : P20 7834

1. Name of the Student : BHAVADHARANI. R ✓
2. Name of his/her Father/Mother : RAVICHANDRAN. ✓
3. Date of Birth as entered in the Admission register : 31.05.2000 ✓
4. Sex : FEMALE
5. Nationality, Religion & Caste : INDIAN - HINDU - ADIDRAVIDAR
6. Month & Year in which he/she was admitted to the college : 29.10.2020
7. Class in which he/she was studying at the time of leaving the college : II M.SC. MATHEMATICS
8. Whether qualified for promotion to higher class under the Madras Educational Rules : REFER MARK SHEETS
9. Medium of Instruction : ENGLISH
10. Whether the student has paid all the fees due to the College : YES
11. Date on which the student actually left the college : 17.06.2022
12. Date of issue of Transfer Certificate : 09-09-2022
13. Conduct & Character : GOOD

ATTESTED


PRINCIPAL,
T. B. M. L. COLLEGE,
PORAYAR - 609 307.




PRINCIPAL 08/7/22



भारत सरकार
GOVERNMENT OF INDIA


பவதாரணி
Bhavadharani
பிறந்த நாள்/DOB: 31/05/2000
பெண்/ FEMALE
Mobile No: 9487380847



5124 0565 0077

ஆதார் -எனது ஆதார், எனது அடையாளம்.


भारतीय विशिष्ट पहचान प्राधिकरण
UNIQUE IDENTIFICATION AUTHORITY OF INDIA

முகவரி:
D/O ரவிச்சந்திரன், ஜெயராம் நகர்,
காட்டுமன்னார்கோயில், கடலூர்,
தமிழ்நாடு - 608301

Address :
D/O Ravichandran,
JAYARAM NAGAR,
Kattumannarkoil,
Cuddalore,
Tamil Nadu - 608301

5124 0565 0077 

1800 300 1947  help@uidai.gov.in  www.uidai.gov.in

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PRINCIPAL,
T. B. M. L. COLLEGE,
PORAYAR - 609 307.



வருமானச் சான்றிதழ்
Income Certificate



சான்றிதழ் எண் / Certificate No: TN-4202206066396

நாள் / Date: 13-06-2022

கடலூர் மாவட்டம், காட்டுமன்னார்கோயில் வட்டம், உடையார்குடி கிராமம் / நகரம், கதவு எண் 47, ஜெயராம் நகர் என்ற முகவரியில் வசித்துவரும் செல்வி பாவதாரணி தந்தையின் பெயர் திரு ரவிச்சந்திரன் அவர்களின் குடும்ப ஆண்டு வருமானம் ரூ. 72000 (ரூபாய் எழுபது இரண்டு ஆயிரம் மட்டும்) என மனுதாரர் அளித்துள்ள விவரங்கள் மற்றும் விசாரணையின் அடிப்படையில் சான்றளிக்கப்படுகிறது.

This is to certify that **Selvi Bhavadharani** daughter of Thiru Ravichandran residing at Door No. 47, Jayaram nagar of Udaiyargudi Village / Town of Kattumannarkoil Taluk of Cuddalore District of the State of Tamil Nadu. His/Her family annual income based on details furnished by his/her in the table below and verification is Rs. 72000/annum (Rupees Seventy Two Thousand Only).

வ.எண் / S. No	குடும்ப உறுப்பினர்களின் பெயர் / Name of the family Member	உறவுமுறை / Relationship	Source of Income					மொத்த வருமானம் / Total Income
			ஊதியம் / ஓய்வூதியம் / Wages / Salary / Pension	தொழில் / மின்பாபாரம் / Profession / Business	விவசாயம் / Agriculture	வாடகை / Rental	மற்றவை / Others	
1	Muhilan	Elder Brother	0	0	6000	0	0	6000
2	Sivanesan	Elder Brother	0	0	0	0	0	0
3	Bhavadharani	Self	0	0	0	0	0	0
Total Annual Income of the Family/ மொத்த குடும்ப வருமானம்			0	0	72000	0	0	72000

ATTESTED

Validity unknown

Digitally signed by Anburaj RAJAVANNIYAN
Date: 13/06/2022 14:25:56 IST

PRINCIPAL,
T B M L COLLEGE,
PORAYAR - 609 307.

மாவட்டம் / District : Cuddalore
வட்டம் / Taluk : Kattumannarkoil

பதவி / Designation : மண்டல துணை வட்டாட்சியர் / Zonal Deputy Tahsildar

குறிப்பு / Remarks :

இச்சான்றிதழ் மின்கையொப்பம் இடப்பட்டதால், கையொப்பம் அல்லது முத்திரை தேவையில்லை /
This certificate is digitally signed and does not require any seal or signature.



ஆவண விவரங்களை உறுதி செய்ய:

(அ) TN-4202206066396 என்ற தனிப்பட்ட சான்றிதழ் எண்ணை <https://tnedistrict.tn.gov.in/tneda/VerifyCerti.xhtml> ல் உள்ளீடு செய்து சரிபார்க்கவும்.
(அல்லது)

(ஆ) கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் இணையதளத்தில் சரிபார்க்கவும்.

Genuineness of the certificate can be verified by.

(a) Keying in the unique certificate number TN-4202206066396 in the URL <https://tnedistrict.tn.gov.in/tneda/VerifyCerti.xhtml>.

(or)

(b) Reading the 2D barcode with mobile barcode reader and verify through online.

சான்றிதழ் செல்லுபடியாகும் காலம் : 13-06-2022 முதல் 12-06-2023

Certificate validity period : 13-06-2022 to 12-06-2023



பிறப்பிடச் சான்றிதழ்
Nativity Certificate



சான்றிதழ் எண் / Certificate No: TN-3202303111060

நாள் / Date: 13-03-2023

கடலூர் மாவட்டம், காட்டுமன்னார்கோயில் வட்டம், உடையார்குடி கிராமம் / நகரம், கதவு எண் 47, ஜெயராம் நகர் என்ற முகவரியில் வசித்துவரும் செல்வி பாவதாரணி தந்தையின் பெயர் திரு ரவிச்சந்திரன் என்பவர் பிறப்பால் தமிழ்நாட்டைச் சார்ந்தவர் எனச் சான்றளிக்கப்படுகிறது.

This is to certify that **Selvi Bhavadharani** daughter of Thiru Ravichandran residing at Door No. 47 street of Jayaram nagar Village / town of Udaiyargudi, Taluk of Kattumannarkoil, Cuddalore District, is a native of the state of Tamil Nadu by birth.

Validity unknown

Digitally signed by SHANKAR K
Date: 13/03/2023 11:55:59 IST

மாவட்டம் / District : Cuddalore
வட்டம் / Taluk : Kattumannarkoil

பதவி / Designation : மண்டல துணை வட்டாச்சியர் / Zonal Deputy Tahsildar

குறிப்பு / Remarks :

இச்சான்றிதழ் மின்கையொப்பம் இடப்பட்டதால், கையொப்பம் அல்லது முத்திரை தேவையில்லை /
This certificate is digitally signed and does not require any seal or signature.



ஆவண விவரங்களை உறுதி செய்ய:

(அ) TN-3202303111060 என்ற தனிப்பட்ட சான்றிதழ் எண்ணை <https://tnedistrict.tn.gov.in/tneda/VerifyCerti.xhtml> ல் உள்ளீடு செய்து சரிபார்க்கவும்.

(அல்லது)

(ஆ) கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் இணையதளத்தில் சரிபார்க்கவும்.

Genuineness of the certificate can be verified by.

(a) Keying in the unique certificate number TN-3202303111060 in the URL <https://tnedistrict.tn.gov.in/tneda/VerifyCerti.xhtml>.

(or)

(b) Reading the 2D barcode with mobile barcode reader and verify through online.

ATTESTED

PRINCIPAL
T B M L COLLEGE
PORAYAR - 609 30

SC



மாவட்டக் குறியீடு எண் / District Code	: 18
வட்டக் குறியீடு எண் / Taluk Code	: 04
கிராமக் குறியீடு எண் / Village Code	: 012

வகுப்புச் சான்றிதழ் Community Certificate



சான்றிதழ் எண் / Certificate No: TN-5202303112250

நாள் / Date: 14-03-2023

கடலூர் மாவட்டம், காட்டுமன்னார்கோயில் வட்டம், உடையார்குடி கிராமம் / நகரம், கதவு எண் 47, ஜெயராம் நகர் என்ற முகவரியில் வசித்துவரும் செல்வி பாவதாரணி தந்தையின் பெயர் திரு ரவிச்சந்திரன் என்பவர், ஆதி திராவிடர் மற்றும் பழங்குடியினர் ஆணைகள் (திருத்தப்பட்ட) சட்டம் 1976 வரிசை எண் 2 ன்படி ஆதி திராவிடர் என்ற பட்டியல் இன வகுப்பைச் சேர்ந்தவர் எனச் சான்றளிக்கப்படுகிறது.

This is to certify that Selvi Bhavadharani daughter of Thiru Ravichandran residing at Door No. 47, Jayaram nagar, of Udaiyargudi Village / Town of Kattumannarkoil Taluk of Cuddalore District of the State of Tamil Nadu belongs Adi Dravida Community, which is recognized as a Scheduled Caste as per the Scheduled Caste and Scheduled Tribes Orders (Amendment) Act. 1976 vide Serial No. 2.

ATTESTED


PRINCIPAL,
T. B. M. L. COLLEGE,
PORAYAR - 609 307.

Signature valid

Digitally signed by TAMILSELVAN M
Date: 14/03/2023 16:15:33 IST

மாவட்டம் / District : Cuddalore

வட்டம் / Taluk : Kattumannarkoil

பதவி / Designation : வட்டாட்சியர் / Tahsildar

குறிப்பு / Remarks :

இச்சான்றிதழ் மின்கையொப்பம் இடப்பட்டதால், கையொப்பம் அல்லது முத்திரை தேவையில்லை /
This certificate is digitally signed and does not require any seal or signature.



ஆவண விவரங்களை உறுதி செய்ய:

(அ) TN-5202303112250 என்ற தனிப்பட்ட சான்றிதழ் எண்ணை <https://tnedistrict.tn.gov.in/tneda/VerifyCerti.xhtml> ல் உள்ளீடு செய்து சரிபார்க்கவும்.

(அல்லது)

(ஆ) கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் இணையதளத்தில் சரிபார்க்கவும்.

Genuineness of the certificate can be verified by.

(a) Keying in the unique certificate number TN-5202303112250 in the URL <https://tnedistrict.tn.gov.in/tneda/VerifyCerti.xhtml>.

(or)

(b) Reading the 2D barcode with mobile barcode reader and verify through online.



A.V.C. COLLEGE (Autonomous)
MANNAMPANDAL - 609 305, MAYILADUTHURAI.
 (AFFILIATED TO THE BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI) ·
 REACCREDITED WITH "A+" GRADE BY NAAC
 UGC RECOGNISED "COLLEGE WITH POTENTIAL FOR EXCELLENCE"
CONSOLIDATED STATEMENT OF MARKS AND GRADES
 Examinations of Post-Graduate Programmes Under Choice Based Credit System (CBCS)



NAME	BHAVADHARANI R		REGISTER NO.	P20 7834			
PROGRAMME	M.Sc.		COURSE	MATHEMATICS			
MONTH & YEAR OF COMPLETION	JUN 2022		PERIOD OF STUDY	2020 TO 2022			
DATE OF BIRTH	31/05/2000						
OVER-ALL PERFORMANCE	MARKS SECURED	%	WAM	CGPA	GRADE	CREDITS	PERFORMANCE
	1846/2100 /	87.90	88.46	9.34	O	90	OUTSTANDING

ABBREVIATIONS:	GRADING OF THE COURSES			FINAL RESULT		
	MARKS SECURED	GRADE POINT	GRADE	CGPA (Cumulative Grade Point Average)	GRADE	PERFORMANCE
MAX - MAXIMUM	90 and above	10	O	9.00 and above	O	OUTSTANDING**
CIA - CONTINUOUS INTERNAL ASSESSMENT	80 and above but below 90	9	A+	8.00 to 8.99	A+	EXCELLENT**
ESE - END SEMESTER EXAMINATIONS	70 and above but below 80	8	A	7.00 to 7.99	A	VERY GOOD
CC - CORE COURSES	60 and above but below 70	7	B+	6.00 to 6.99	B+	GOOD
EDC - EXTRA DISCIPLINARY COURSES	50 and above but below 60	6	B	5.00 to 5.99	B	ABOVE AVERAGE
EC - ELECTIVE COURSE						
PW - PROJECT WORK						
SSC - SELF STUDY COURSE						
S - SUPPLEMENTARY						

*The Candidates who have passed in the first appearance and within the prescribed duration of the PG programme are eligible. Otherwise the performance is Very Good

The Overall Performance of the Candidate from the First Semester to Final Semester

i.e. CGPA and WAM are calculated by the following formulae:

$$CGPA \text{ (Cumulative Grade Point Average)} = \frac{\sum_{i=1}^n C_i G_i}{\sum_{i=1}^n C_i}; \quad WAM \text{ (Weighted Average Marks)} = \frac{\sum_{i=1}^n C_i M_i}{\sum_{i=1}^n C_i}$$

Where 'C_i' is the Credit earned for the Course i; 'G_i' is the Grade Point obtained by the student for the Course i.

'M_i' is the Marks obtained for the Course i and 'n' is the number of courses cleared. For details of Marks see overleaf.

For Post Graduate Programme (PG) Passing Minimum: CIA - 45%, ESE - 45% and Aggregate - 50%.

Declaration: A candidate is declared to have completed the Post Graduate Programme successfully only if he/she has earned a minimum of 90 credits.

For M.Phil Passing Minimum: CIA - 40%, ESE - 40% and Aggregate - 50%

Medium of instruction and examinations are only in English except M.A Tamil.



This college was conferred autonomous status from the year 1987 - 88 as per the Communications:
 No. Acc IV/Autonomous - 87/1636, dated 24.6.1987 of Bharathidasan University;
 F.24.3.1987 (NFE) dated 10.6.1987 of the University Grants Commission and
 G.O.Ms.No. 1269, dated 5.8.1987 of Government of Tamil Nadu.

Under the Autonomous Status granted, the college is given freedom to design the syllabi for the various Programmes granted affiliation by the University, evaluate performances of the candidates and publish their results. All these are processed by various bodies like the Governing Council, the Academic Council, the Boards of Studies (for each discipline), and the Board of Examinations functioning in the college. The results announced are approved by the University.

Finally, the Bharathidasan University, Tiruchirappalli, confers Degrees / Diplomas to the candidates declared to have passed as per the regulations of the college.

Verified



G. Aranganathan
 Controller of Examinations

ATTESTED

 PRINCIPAL,
 T B M L COLLEGE,
 PORAYAR - 609 307.

NAME		REGISTER NO.		DATE OF BIRTH					
PROGRAMME		COURSE		P20 7834					
M. SC.		MATHEMATICS		31/05/2000					
ROLL NO.	COURSE CODE	COURSE TITLE	MARKS SECURED			GRADE POINT	GRADE	CREDITS	MONTH & YEAR OF PASSING
			OB	SE	TOTAL / MAX-100				
1	18PMA 101	CC ABSTRACT ALGEBRA	22	63	85	9	A+	5	DEC 2020
1	18PMA 102	CC REAL ANALYSIS	22	67	89	9	A+	5	DEC 2020
1	15PMA 103	CC MECHANICS	23	70	93	10	O	4	DEC 2020
1	15PMA 104	CC DIFFERENTIAL EQUATIONS	25	68	93	10	O	4	DEC 2020
1	15PMAE 101	EC FUZZY SETS AND ITS APPLICATIONS	24	72	96	10	O	4	DEC 2020
2	18PMA 205	CC ADVANCED ALGEBRA	22	69	91	10	O	4	JUN 2021
2	18PMA 206	CC COMPLEX ANALYSIS	21	70	91	10	O	5	JUN 2021
2	15PMA 207	CC TOPOLOGY	23	62	85	9	A+	5	JUN 2021
2	18PMA 208	CC PROBABILITY AND STATISTICS	22	57	79	8	A	4	JUN 2021
2	18EDHI 201	EDC CIVIL SERVICE EXAMINATION AND PERSONALITY DEVELOPMENT	19	54	73	8	A	2	JUN 2021
3	18PMA 309	CC MEASURE AND INTEGRATION	23	71	94	10	O	5	FEB 2022
3	18PMA 310	CC FUNCTIONAL ANALYSIS	21	68	89	9	A+	5	FEB 2022
3	18PMA 311	CC PROGRAMMING IN C++	21	72	93	10	O	6	FEB 2022
3	18PMAP 312	CC PRACTICAL - PROGRAMMING IN C++	40	58	98	10	O	2	FEB 2022
3	18PMAE 302	EC GRAPH THEORY	22	72	94	10	O	4	FEB 2022
3	18EDBO 302	EDC HERBAL MEDICINE	18	59	77	8	A	2	FEB 2022
4	18PMA 413	CC DIFFERENTIAL GEOMETRY	18	68	86	9	A+	4	JUN 2022
4	18PMA 414	CC STOCHASTIC PROCESSES	22	61	83	9	A+	5	JUN 2022
4	18PMA 415	CC INTEGRAL EQUATIONS	24	69	93	10	O	5	JUN 2022
4	18PMAE 403	EC OPERATIONS RESEARCH	23	52	75	8	A	4	JUN 2022
4	11PMAPR 4	PW PROJECT WORK AND VIVA VOCE	25	64	89	9	A+	6	JUN 2022
----- END OF STATEMENT									

Any candidate who disputes this Statement of Marks, For details of Grading System, see annexed.

G. Srinivasan
 Controller of Examinations



18/05/2022
 11:30 AM



Tranquebar Bishop Manikam Lutheran College (TEL C)
Porayar 609307, Mayiladuthurai District, Tamil Nadu, India

25.02.2023

From

Ms. R.Bhavadharani,
Research Scholar,
PG & Research Department of Mathematics,
T.B.M.L. College, Porayar-609307,
Mayiladuthurai District, Tamil Nadu


To

The Director,
Directorate of Academic Research,
Annamalai University,
Annamalai Nagar – 608 002,
Tamil Nadu-India.

Through

The Principal,
T.B.M.L College,
Porayar-609307,
Mayiladuthurai District, Tamil Nadu

FORWARDED

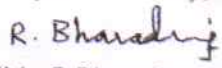

PRINCIPAL
T.B.M.L. COLLEGE
PORAYAR

Respected Sir,

Sub: T.B.M.L College, Porayar – Ph.D. Programme (Full Time) in Mathematics
– Ms. R.Bhavadharani – Payment of Research fees & Joining Report–
Regarding.
Ref: Your letter DARE/Ph.D./2022-23/ Dated: 23.02.2023

With reference to the above, I would like to inform you that I have paid the research fee of Rs. 3100 in the College. I herewith attached the xerox copy of the receipt for the payment of research fee Rs. 3100 for university, the copy of admission card and the joining report for Full Time Ph.D. Degree Programme in Mathematics. This is for your kind perusal and esteemed consideration.

yours faithfully,


(Ms. R.Bhavadharani)

ATTESTED


PRINCIPAL,
T B M L COLLEGE,
PORAYAR - 609 307.



Tranquebar Bishop Manikam Lutheran College (TELC)
Porayar 609307, Mayiladuthurai District, Tamil Nadu, India

25.02.2023

From

Ms. R. Bhavadharani,
Research Scholar,
PG & Research Department of Mathematics,
T.B.M.L. College, Porayar-609307,
Mayiladuthurai District, Tamil Nadu

To

The Principal,
T.B.M.L College,
Porayar-609307,
Mayiladuthurai District, Tamil Nadu

Through

Dr.R. Irene Hepzibah (Research Supervisor)
Assistant Professor,
PG & Research Department of Mathematics,
T.B.M.L. College, Porayar-609307,
Mayiladuthurai District, Tamil Nadu

Respected Madam,

Sub: T.B.M.L College, Porayar – Ph.D. Programme (Full Time) in Mathematics
– Ms. R. Bhavadharani – Joining Report– Regarding.
Ref: DARE/Ph.D./2022-23/ Dated: 23.02.2023.

.....

In compliance with the letter issued by the office of the Director, Directorate of Academic Research, Annamalai University (DARE/Ph.D./2022-23/Dated: 23.02.2023), I, **Ms. R. Bhavadharani** join as Ph.D. Scholar (Full Time- Mathematics) under the supervision of **Dr.R. Irene Hepzibah**, on 25.02.2023 in the PG & Research Department of Mathematics, T.B.M.L. College, Porayar. I shall abide by all the rules and regulations of the college and the affiliated university.

yours faithfully,

R. Bhavadharani
(Ms. R. Bhavadharani)

Copy To

The Director,
Directorate of Academic Research,
Annamalai University,
Annamalai Nagar – 608 002,
Tamil Nadu-India.

forwarded

R. Irene Hepzibah
25/02/2023

Dr.R.IRENE HEPZIBAH, M.Sc.,M.Phil.,Ph.d.,
Assistant Professor & Research Advisor,
PG & Research Department of Mathematics,
T.B.M.L College, Porayar-609 307,
Mayiladuthurai District, Tamilnadu, India.

Dr.A.Ragupathy
Director

Annamalai University
Annamalainagar - 608002
Tamilnadu - India
Mobile No:+91 9345520430
Email:careau2018@gmail.com

DARE/Ph.D./2022-23

Date:23-02-2023

To

The Principal
T.B.M.L. College
Porayar

Sir/Madam,

Sub : Admission to Ph.D.Degree Programme in Mathematics Full time - Approval-
Intimation-Reg.

Ref : 1. Application of Mr./Ms.BHAVADHARANI R

2. Orders of the Vice-Chancellor dated:10-02-2023

With reference to the application of Mr./Ms. **BHAVADHARANI R** I am to inform you that as recommended by the Admission Committee he/she has been provisionally selected for admission to the Ph.D.Programme in **Mathematics {Full time}** under the guidance of **Dr.IRENE HEPZIBAH R, Assistant Professor, Mathematics, T.B.M.L. College.**

The following fees are to be collected from the candidate and remitted to the University.

Sino	Particulars	Amount
1	Cultural and Youth Festival Fee (Other than Sports,NSS etc.)	Rs.50/- at entry only
2	Fee for the Development of Infrastructural facilities in the University	Rs.50/- at entry only
3	Library Fee	Rs.1000/- Per Annum
4	Registration Fee	Rs.1000/-
5	Pre-Registration course work fee	Rs.1000/-
Total		Rs.3100/-

The above fees should be remitted directly through RTGS/NEFT mode to Annamalai University savings bank account maintained in ICICI Bank, Annamalai Nagar-608 002 as given below:

IFSC Code No.	MICR Code No.	SB A/c No.
ICIC0006212	608229009	621201159593

- The payment should be made on or before 28-02-2023.
- Once the fees are remitted, the researcher has to submit a joining report to the institution concerned. A copy of the joining report has to be submitted to The Director, DARE, Annamalai University.
- The date of submission of the joining report is considered to be the date of commencement of the Ph.D. degree programme to the candidate concerned.
- In case, the fees are not paid on time, the admission for the Ph.D. Programme shall stand cancelled.
- The candidates will be governed by the Ph.D. Programme regulations of the Annamalai University.

The research fees and such other fees are also payable by the candidate as prescribed by the College/Institution. The fees shown above are subject to revision.

The full-time Ph.D. scholar should not be in any Full-Time or Part-Time employment. If the candidate takes up Full-Time or Part-Time employment anywhere after registration and before completion of the Ph.D. programme, he/she should intimate the fact to the University immediately and get the Full-Time registration converted into part-time registration which will be considered on individual merit subject to his/her eligibility. If any suppression of fact comes to notice later on, the Ph.D. registration is liable to be cancelled and the candidate is liable for disciplinary action.

The research scholar is instructed to send the following, through the Head of the Institution/College to "The Director, Directorate of Academic Research, Annamalai University, Annamalai Nagar - 608 002" within 10 days from the receipt of this letter.

- 1 Covering letter
- 2 The joining report
- 3 Fees receipt/Original challan

I further inform you that as per the admission procedure, the Head of the Institution has to issue the admission card to the candidate. I, therefore, request you to kindly issue the admission card to the candidate concerned with a copy to this office.



Yours faithfully


Director - DARE

Copy to:

✓ BHAVADHARANI R
50, JAYARAM NAGAR
UDAIYARGUDI
KATTUMANNAR KOIL



தமிழ்நாடு அறிவியல் தொழில்நுட்ப மாநில மன்றம்
TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

(Established by Government of Tamilnadu)
Directorate of Technical Education Campus, Chennai - 600 025.

Phone : 044 - 2230 1428

Web : www.tanscst.nic.in

Telefax : 044 - 2230 1552

E-mail : ms.tanscst@nic.in / enquiry.tanscst@nic.in

DR. R. SRINIVASAN, M.Sc., Ph.D., F.I.C.S., M.A.C.S. (USA).
Member Secretary

Ref: TNSCST/RFRS/07/VM/2021-22

05.07.2023

To

E. Paulson,
Research Scholar,
PG & Research,
Dept. of Physics, TBML College,
Porayar, Mayiladuthurai-609307
Mobile : 8056368765

Sub: Programme to bridge the gap in research funding for research scholars
in colleges (RFRS-2021-2022)- Approval – Intimated – Reg.

Ref: Chairman Approval dt.28.06.2023

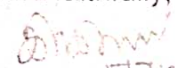
With reference to the above, I am happy to inform that your research work has been
approved for financial support under RFRS scheme of the Council as per the details given
below:-

Title	Amount Rs.in lakh	Duration
A study on the sunlight induced-degradation of noxious industrial dye molecules employing metal oxide anchored reduced grapheme oxide	3.00	2 years

- If you are receiving any other fellowship / financial assistance from any other government / scientific agencies, you are not eligible for the RFRS of the Council.
- Therefore, you must certify that you are not receiving funds from other sources
- Two copies of thesis and utilization certificate should be submitted on completion of RFRS
- Kindly send your acceptance to avail RFRS as per the above terms and conditions on or before **18.07.2023**.
- You are also requested to provide your Institutional Bank account details such as Name of the A/C, Account Number, Account type (SB or CA), IFSC Code, Name of the Bank, Branch.

With best wishes,

Yours faithfully,


5723
Member Secretary

Encl: Terms and conditions

Copy to:

The Principal
TBML College,
Porayar,
Mayiladuthurai-609307

Dr.M. Jothibas
Assistant Professor of Physics
TBML College, Porayar
Mayiladuthurai-609307



தமிழ்நாடு அறிவியல் தொழில்நுட்ப மாநில மன்றம்
TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

(Established by Government of Tamilnadu)

Directorate of Technical Education Campus, Chennai - 600 025.

Phone : 044 - 2230 1428

Web : www.tanscst.nic.in

Telefax : 044 - 2230 1552

E-mail : ms.tanscst@nic.in / enquiry.tanscst@nic.in

DR. R. SRINIVASAN, M.Sc., Ph.D., F.I.C.S., M.A.C.S. (USA).
Member Secretary

Ref: TNSCST/RFRS/07/VM/2021-22

9744

21.07.2023

To

The Principal
TBML College,
Porayar,
Mayiladuthurai-609307

Sir/Madam,

Subject : Programme to bridge the gap in research funding for research scholars in colleges (RFRS) – Release of first instalment – regarding.

Reference: 1. Our approval letter dated 28.06.2023
2. Acceptance letter dated 11.07.2023 from E. Paulson, with bank details through proper channel

With reference to the above, I am happy to inform that first instalment of grant of Rs. 1,50,000/- (Rupees One lakh fifty thousand only) has been transferred to Institutional Account (To NEFT/CIUB/IDIBH23201189230 on 20.07.2023 A/C transfer from Indian Bank, DOTE branch). A stamped receipt should be sent in acknowledgement.

Above amount is released towards RFRS sanctioned to E. Paulson, Research Scholar, PG & Research, Dept. of Physics, TBML College, Porayar, Mayiladuthurai - 609 307. The grant is to be released to the individual. The RFRS grant released is from 01.04.2022. Other terms and conditions are as per our approval dated 28.06.2023.

As per the terms & conditions, two copies of progress report for the first year period of RFRS (from 01.04.2022) and two copies of utilisation certificate for the first instalment of grant released should be submitted to the Council in the prescribed format (sent along with our approval letter) immediately for release of second year grant.

Yours faithfully


Member Secretary

Copy to:

E. Paulson,
Research Scholar,
PG & Research,
Dept. of Physics, TBML College,
Porayar, Mayiladuthurai-609307

✓
Dr.M. Jothibas
Assistant Professor of Physics
TBML College, Porayar
Mayiladuthurai-609307

TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY
DOTE CAMPUS, Chennai- 25

List of approved RFRS - (2021-2022)

Sl. No.	Name and address of the student	Title of the project	Total Amount for 2 yrs (Rs. In lakh)
1	Ms. Rajalakshmi. K, Research Scholar, Department of Plant breeding and Genetics, Agricultural College and Research Institute, TNAU Madurai – 625 104	Genetic and molecular study for MYMV and powdery mildew resistance in blackgram (<i>Vigna mungo</i> (L.) Hepper)	3.00
2	B. Archana, Research Scholar, The American College, Madurai - 625 002	Baseline study on the diversity, plant interaction, nanostructures, barcoding and conservation of butterflies in kodimangalam reserve forest, Madurai.	3.00
3	Ms.S.Kavitha, Research Scholar, Department of Mathematics, St. Mary's College, Thoothukudi – 628 001	V4-Vertex Magic Graph Labeling	3.00
4	M.Shoban Babu, Research Scholar, Department of Mech Engg Government College of Technology, Coimbatore-641 013	Experimental investigation on novel design, development and synthesis of electrode and catalyst materials for fuel cell applications	3.00
5	M.Bhuvaneswari, Ph.D.Research Scholar, Department of Botany, Vellalar College For Women, Erode-638 012	Conservation Techniques and Biological Applications in <i>Ceropegia juncea</i> Roxb.	3.00
6	S. Deepa, Research Scholar, Department of Botany, PSG College of Arts and Science Coimbatore- 641 014	Micropropagation, conservation & Pharmacological Evaluation focusing atopical Dermatitis from <i>Mitrephora heyneana</i> (Hook.F. & Thomson) Thwaites - Annonaceae	3.00
7	E. Paulson, Research Scholar, PG & Research. Dept. of Physics, TBML College, Mayiladuthurai-609307	A study on the sunlight induced- degradation of noxious industrial dye molecules employing metal oxide anchored reduced grapheme oxide	3.00

8	B.Selvakumaran, Research Scholar, Department of Chemistry, National College, Tiruchirapalli – 620 001	Catalytic Activity of Mono- and Dicopper(ii) complexes: Synthesis, Structure, Spectral, Magnetic and Redox Properties	3.00
9	S Thangapriya, Research Scholar, Sarah Tucker College Tirunelveli –627 007	An intelligent prediction model for activity recognition based on healthcare data	3.00
10	M. Narayanan, Ph.D Research Scholar, Department of Commerce Vivekananda College Tiruvedakam West, Madurai - 625 234	Effectiveness of green banking initiatives: An empirical study of customer perception towards selected public sector and private sector banks in Southern Districts of Tamilnadu.	3.00
Total			30.00

-Sd-
Member Secretary

1. Name and Institutional address of the research scholar : T.B.M.L College,
Porayar-609307.
Tharangambadi Tk,
Mayiladuthurai Dt.
Email id: tbmlcollege@gmail.com,
Phone: 04364 289426.
2. Permanent/Residential address of the candidate with phone, fax, email etc. : E. Paulson,
1/233, Main road,
Sembanarkoil po,
Tharangambadi Taluk,
Mayiladuthurai district.
Email: paulson071095@gmail.com,
Contact: 8056368765.
3. Sex : Male
4. Date of birth : 07/10/1995
5. Nativity : Sembanarkoil
6. Broad area of Research : Physical Science
7. Educational Qualifications

Degree	University	Subject(s)	CGPA	Distinction
B.Sc.	Bharathidasan University	Physics (Core) Mathematics (Allied), Chemistry (Allied), Language.	7.99	First-class with D grade
M.Sc.	Bharathidasan University	Classical and Relativistic Mechanics, Mathematical Physics, Advanced Electronics, Biomedical Instrumentation, Solid State Physics, Quantum Mechanics, Microprocessor & Its Applications, Environmental Chemistry, Electromagnetic Theory, Statistical Mechanics, Atomic and Molecular Spectroscopy, Photonics and Nano Physics, Advanced Electronics, Nuclear and Particle Physics, Analytical Methods in Physics, Advanced Material science.	8.04	Excellent with A ⁺ grade

1. Name and Institutional address of the research scholar : T.B.M.L College,
Porayar-609307.
Tharangambadi Tk,
Mayiladuthurai Dt.
Email id: tbmlcollege@gmail.com,
Phone: 04364 289426.
2. Permanent/Residential address of the candidate with phone, fax, email etc. : E. Paulson,
1/233, Main road,
Sembanarkoil po,
Tharangambadi Taluk,
Mayiladuthurai district.
Email: paulson071095@gmail.com,
Contact: 8056368765.
3. Sex : Male
4. Date of birth : 07/10/1995
5. Nativity : Sembanarkoil
6. Broad area of Research : Physical Science
7. Educational Qualifications

Degree	University	Subject(s)	CGPA	Distinction
B.Sc.	Bharathidasan University	Physics (Core) Mathematics (Allied), Chemistry (Allied), Language.	7.99	First-class with D grade
M.Sc.	Bharathidasan University	Classical and Relativistic Mechanics, Mathematical Physics, Advanced Electronics, Biomedical Instrumentation, Solid State Physics, Quantum Mechanics, Microprocessor & Its Applications, Environmental Chemistry, Electromagnetic Theory, Statistical Mechanics, Atomic and Molecular Spectroscopy, Photonics and Nano Physics, Advanced Electronics, Nuclear and Particle Physics, Analytical Methods in Physics, Advanced Material science.	8.04	Excellent with A ⁺ grade

M.Phil.	Bharathidasan University	Research Methodology, Advanced Physics, Teaching and Learning skills, Condensed Matter Physics.	8.33	Excellent with A ⁺ grade
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8. Broad area of Research and date of Ph.D. : Nanoscience

9. List of Research papers already published. : 3

Author	Title	Journal	Page No.	Impact factor
E. Paulson	Significance of Thermal Interfacing in Hematite (α -Fe ₂ O ₃) Nanoparticles synthesized by Sol-Gel Method and its Characteristics Properties	Surfaces and Interfaces (Elsevier)	101432	4.837
E. Paulson	Effect of co-dopant proportion on the structural, optical and magnetic properties of pristine NiO nanoparticles synthesized by Sol-gel method	Journal of Materials Science: Materials in Electronics (Springer)	907-919	2.478
E. Paulson	The impacts of interfacing phytochemicals on the structural, optical and morphology of hematite nanoparticles	Surfaces and Interfaces (Elsevier)	101734	4.837

10. Brief write up (abstract) of the proposed research work

A study on the sunlight induced-degradation of noxious industrial dye molecules employing Metal oxide anchored reduced graphene oxide

India is primarily an agricultural country, particularly in Tamil Nadu. A large percentage of people's lives were reliant on agricultural economic advantages. Significantly in delta regions like Thanjavur, Thiruvarur, and Nagapattinam. In addition, a substantial percentage of textile and dye industries were in operation, which could be directly causing the surfaces, static, dynamic water bodies. Water is a basic necessity for life on Earth, but it is severely polluted due to direct waste discharge from industry sectors. [1,2] A significant amount of waste is generated by the textile and dye industries; there are over a hundred thousand commercially available dyes. Those certain discharges notably rhodamine B are environmentally hazardous and aquatic life, as well as being nonbiodegradable. As a result, removing them from wastewater water is critical and difficult in terms of environmental protection. As a result, methodologies for removing organic dyes from industrial effluents are required. As an energy-free process, energy from the sun can be used to completely break down contaminants in wastewater. In current history, functionalized rGO-based semiconductor photocatalysts have been a hot topic of research in photocatalysis [3-5] just a few of the many potential applications for graphene oxide-based materials in green energy. Reduced Graphene oxide is also recognized as an efficient catalyst for hydrogen production and excellent support for catalysts due to its superior carrier mobility and large specific surface area. Various metal oxides certainly Fe_2O_3 [6] have been extensively researched in recent decades, and proven to be effective co-catalytic materials for dealing with a wide range of environmental issues, including hazardous water remediation, air cleanup, and water treatment. Our aim and scope of the research are to oxidize the raw graphite via Hummer's method and reduced it under vacuum annealing [7]. The essential metal oxides were

synthesized using Phyto molecules [8]. Thereafter, it will be decorated upon the reduced graphene oxide. Analyze the catalytic performance of rhodamine B dye aqueous-phase degradation. Furthermore, the effect of various experimental parameters such as metal oxide content, light, and pH of solution on photocatalytic dye, determine the catalytic recycling stability, and chemical/Biological oxygen demand will investigate.

Reference:

1. A. Khatri, M. H. Peerzada, M. Mohsin, M. White, J. Cleaner Prod. 2015, 87, 50–57.
2. S. D. Richardson, S. Y. Kimura, Anal. Chem. 2016, 88, 546-582.
3. Q. Wang, X.F. Guo, L.C. Cai, Y. Cao, L. Gan, S. Liu, Z.X. Wang, H.T. Zhang, L.D. Li, TiO₂-decorated graphenes as efficient photoswitches with high oxygen sensitivity, Chem. Sci. 2 (2011) 1860-1864.
4. Y.H. Zhang, B. Shen, H.W. Huang, Y. He, B. Fei, F.Z. Lv, BiPO₄/reduced graphene oxide composites photocatalyst with high photocatalytic activity, Appl. Surf. Sci. 319 (2014) 272-277.
5. X. Zhou, T.J. Shi, J. Wu, H.O. Zhou, (001) Facet-exposed anatase-phase TiO₂ nanotube hybrid reduced graphene oxide composite: Synthesis, characterization and application in photocatalytic degradation, Appl. Surf. Sci. 287 (2013) 359-368.
6. F. Toma, L. Berger, I. Shakhverdova, B. Leupolt, A. Potthoff, K. Oelschlägel, Therm. Spray Technol. 23(2014) 1037-53
7. Pankaj Kumar, Neetu Divya, Jatinder Kumar Ratan, Study on the physicochemical properties of reduced graphene oxide with different degrees of reduction temperature, Journal of the Iranian Chemical Society, <https://doi.org/10.1007/s13738-020-02014-w>
8. Thivaharan Varadavenkatesan, Elizaveta Lyubchik, Shraddha Pai, Arivalagan Pugazhendhi, Ramesh Vinayagam, Raja Selvaraj, Photocatalytic degradation of Rhodamine B by zinc oxide nanoparticles synthesized using the leaf extract of *Cyanometra ramiflora*, Journal of Photochemistry & Photobiology, B: Biology, <https://doi.org/10.1016/j.jphotobiol.2019.111621>.

11. Detailed proposal :

A study on the sunlight induced-degradation of noxious industrial dye molecules employing Metal oxide anchored reduced graphene oxide

Because of the rapid increase in industrialization and urbanization, water is becoming more contaminated and polluted than ever before by various pollutants that contaminate our drinking water, such as paints, toxic solvents, fertilized soils, and dyes [1, 2]. Because dyes are widely used in industry and cannot be easily removed, they produce a large amount of toxic, mutagenic, and carcinogenic substances [3,4]. Urging wastewater treatment to

continuously grow and improve in order to meet the rising demand for clean and healthy water [5] suitable for human ingestion, as it is the most vital source of life [6] for all organisms, from the simplest organisms to the most complex animals and plants. Considerably, Rhodamine B is a family of xanthene dye being used in the production of textiles, paper, paint, and leather. As a consequence, it is critical to develop effective methods for removing rhodamine B before it is discharged into rivers and lakes. In terms of overall environmental health, the discharge of rhodamine B effluents of industrial wastewater containing hazardous, carcinogenic, and non-biodegradable organic dyes in water-bodies is continuously degrading the ecological balance and causing many serious diseases [7]. In addition, there are several traditional wastewater treatment procedures, such as filtration, chemical precipitation, ion exchange, membrane technologies, and adsorption [8-10], have significant drawbacks and limitations, including high operating costs, inefficiency with low concentration, poor selectivity, and the potential ejaculate of secondary toxins into the environment, posing a serious risk to the environment and people's health. In the same sense, noticeable photocatalysis using reduced graphene oxide and metal oxides-based reduced graphene oxide [11] and its composites have piqued the interest of many researchers due to its promising applications in the field of water remediation. Sunlight-induced dye decomposition has a highly efficient as well as the capabilities to use the most renewable and sustainable source of energy, sunlight, and thus can offer conceivable solutions to minimize the level of water pollution. Photocatalysts, visible light irradiation, and oxidants are all examples of advanced oxidation processes. The reaction is carried out by reactive species such as hydroxyl radicals ($^{\circ}\text{OH}$) and superoxide anion (O_2^-), which are produced when our synthesized catalytic material hits the water and oxygen and absorbs radiation, resulting in rapid and non-selective oxidation. Graphene and graphene-based composite materials are currently gaining popularity due to their numerous advantages such as high optical

absorption, fast charge carrier mobility, high conductivity, non-toxicity, resistance to corrosion, distinctive surface characteristics, and environmental acceptability. Although few milestones have already been documented for improving the photocatalytic efficiency of metal oxide-based or metal-graphene-based nanostructures for organic pollutant degradation [12]. We desired to decorate the rGO planes with hematite nanoparticles because its highly stable - α -Fe₂O₃ (alpha-phased) hematite is mainly in the rhombohedral crystalline structure. That has unusual physical, chemical activity. Hematite is an inexpensive and profuse material, and it is specific physicochemical and magnetism features in the colloidal form it has an extraordinary system that has all of the characteristics needed to build groundbreaking kinds of chemically or magnetically impelled active systems. According to the merits, it appraised to applicable-in the most advanced applications such as gas sensing, catalytic activity for effective removal of stable organic waste in water, corrosion resistance, solar active material because of its small bandgap of n-type material, targeted drug delivery, magnetic storage devices, tunable optical behaviors, substantially its persistent electron-electron interactions and electron-photon resonances are present, as well as complex electronic structures with intriguing optoelectronic properties. The mineral ore hematite can be naturally found and synthesized in microcrystalline and nanocrystalline phases. In aqueous conditions, there are several approaches to produce crystalline hematite particles using a variety of the above-mentioned synthesis pathways with having several demerits. And the hematite mainly plays a significant role in biomedical applications due to its biocompatibility behaviors associated with less toxicity. The present work emphasizes investigating the photodegradation capability of pure reduced graphene oxide nanosheets and metal oxides anchored rGO nanosheets. Initially, we chemically oxidize the graphite flakes using several strong oxidizing chemicals followed by Hummer's procedure, then the exfoliated GO was reduced through thermal treatment. On the other hand, the required metal oxides were only

synthesized via the green method using "Wrightia Tintoria" plant leaf extract. The deciduous W. Tintoria plant, commonly called "Sweet indrajao", belonging to the "Apocynaceae" family, is primarily located in dry and moist regions in India and Burma. Every part of the plant was accumulating dozens of medicinal graded secondary metabolites. This current scenario uses W. Tintoria leaf because it has a rich quantity of Flavonoid, Saponins, Alkaloids, Tannins, Steroids, Phenols, etc., mentioned are effectively interfacing with our precursor material. In addition, the effect of various experimental parameters such as metal oxide content, light, and solution pH on photocatalytic dye, catalytic recycling planned to study it will help to understand the material stability, and moreover, the chemical oxygen demand (COD)/Biological oxygen demand (BOD) was planned to investigate. Because, it will give an assurance of us, how much the treated solution was suitable for the agricultural sector, how much it suitable and ecofriendly to growing crops.

References:

1. A. Fuwad, H. Ryu, N. Malmstadt, S.M. Kim, T. Jeon, *Desalination*, 458: (2019) 97-115.
2. R. Haounati, H. Ouachtak, R. El Haouti, S. Akhouaifi, F. Largo, F. Akbal, F. Largo F. Akbal, A. Benlhachemi, A. Jada, A. Ait Addi, *Sep. Purif. Technol.* (2020). 117335.
3. H. Ouachtak, R. El Haouti, A. El Guerdaoui, R. Haounati, E. Amaterz, A. A. Addi, F. Akbal, Taha, *J. Mol. Liq.* 309 (2020) 113142.
4. L.V. da Silva, J.B. López-Sotelo, A. Correa-Guimarães, S. Hernández-Navarro, M. Sánchez Bascónes, L.M. Navas-Gracia, *J. Environ. Manage.* 155(2015) 67-76.
5. X. Yan, Z. Zhu, T. Li, *Environ. Sci. Pollut. Res.* 26 (2019) 17901-10
6. F. Westall, A. Brack, *Space Sci. Rev.* 214 (2018) 1-23
7. Ali Akbar Isari, Amir Payan, Moslem Fattahi, Sahand Jorfi, Babak Kakavandi, Photocatalytic degradation of Rhodamine B and Real Textile Wastewater using Fe-Doped TiO₂ anchored on Reduced Graphene Oxide (Fe-TiO₂/rGO): Characterization and feasibility, mechanism and pathway studies, <https://doi.org/10.1016/j.apsusc.2018.08.133>.
8. R. El Haouti, H. Ouachtak, A. El Guerdaoui, A. Amedlous, E. Amaterz, R. Haounati, A. Ait Addi, F. Akbal, N. El Alem, M. LabdTaha. *J. Mol. Liq* 290 (2019) 111139.
9. A.E. Burakov, E.V. Galunin, I.V. Burakova, A.E. Kucherova, S. Agarwal, A.G. Tkachev, *Ecotox. Environ Safe.* 148 (2018) 702-12.
10. B. Du, A.E. Price, W.C. Scott, L.A. Kristofco, A.J. Ramirez, C.K. Chambliss, *Sci. Total Environ.* 466-467 (2014) 976-84.
11. Posa, V. R. et al. Preparation of Graphene-TiO₂ Nanocomposite and photocatalytic degradation of rhodamine-B under solar light irradiation. *J. Exp. Nanosci.* 11, 722-736 (2016).

12. Luo, S. et al. Rational and green synthesis of novel two-dimensional WS₂/MoS₂ heterojunction via direct exfoliation in ethanol-water targeting advanced visible-light-responsive photocatalytic performance. *J. Colloid Interface Sci.* 513, 389–399 (2018).

Review of literature

Lingling Sun Guohong et al (2015)., Graphene oxide (GO) in semiconductors has been identified as one of the most effective methods for increasing photocatalytic activity. They demonstrated that Cu₂O-reduced graphene oxide (Cu₂O-rGO) composites with low loading (0-0.5 wt. percent) of graphene oxide (GO). Under visible light irradiation, composite microspheres demonstrated enhanced photocatalytic activity for the degradation of RhB aqueous solution. Cu₂O-rGO composites demonstrated the highest photocatalytic activity at the optimal graphene oxide loading (0.05 wt.%).

Sana Frindy, et al (2019)., has reported the synthesis of hematite nanoparticles using a simple and environmentally friendly hydrothermal method has been hybridized with different loadings of graphene obtained from the pyrolysis of biopolymers (alginate, chitosan, and carrageenan). Under visible light irradiation, the resulting hematite-Gr catalyst exhibits a high catalytic activity of 98 percent toward rhodamine B dye degradation.

Wang, Aolan, et al (2018)., has reported that Cuprous oxide (Cu₂O)/reduced graphene oxide (rGO) composites were created using copper acetate adsorbed graphene oxide (GO) sheets as precursors and in-situ reduction in the presence of ethylene glycol. An initial investigation of the photocatalytic activities of Cu₂O/RGO nanocomposites, including photodegradation of Rhodamine B dye and photo-reduction of CO₂, was carried out under the illumination of simulated sunlight. The photocatalytic activity of the as-synthesized nanocomposites was higher than that of the conventional Cu₂O particles. The photodegradation efficiency increased by about 52%, and the methanol yield increased by about 53%. The

improved photocatalytic activities were attributed to improved charge transfer from Cu_2O to RGO, increased specific surface area, and increased reaction sites.

Ye Cong, et al (2013), has reported TiO_2 -Graphene oxide (GO) was successfully prepared in two steps: in situ growth of a uniform TiC layer on graphene oxide sheets, followed by oxidation conversion of TiC to anatase TiO_2 . The degradation of methylene blue (MB) under visible light irradiation was used to assess photocatalytic activity. The results indicate that TiO_2 -GO has a similar morphology to pristine GO sheets and that nanosize anatase TiO_2 particles are distributed uniformly and densely on the surface of GO sheets.

K. D. R. N. Kalubowila, et al (2021), has reported a photocatalytic powder composite with nanosized $\text{Cu}_2\text{O}/\text{Cu}$ granules wrapped in multilayered reduced graphene oxide (rGO) sheets were created. potentiostatic electrodeposition of n-type Cu_2O thin films on Ti substrates in an acetate bath started the fabrication process. The composite demonstrated its ability to split water in the presence of methanol under visible light, establishing a promising platform for the development of a variety of other photocatalytic applications.

Shancheng Yan, et al (2013), have reported CdS nanoparticle/functionalized graphene sheet nanocomposites (CdS NP/FGS) were successfully synthesized in a one-step hydrothermal synthesis route. Using visible light, the photocatalytic performance of CdS NP/FGS composites and pure CdS in the degradation of methyl orange (MO) was investigated. When compared to pure CdS, the addition of FGS improves the photocatalytic performance of CdS NP/FGS composites, with a maximum degradation efficiency of 98.1 % under visible light irradiation (60.1%). This discovery can be attributed to three factors. The first is CdS's strong redox ability in a nanocomposite with a smaller crystal size. The second effect is an increase

in specific surface area due to more adsorbed MO. The third effect of FGS is a decrease in electron-hole pair recombination. The CdS NP/FGS composites are expected to be a practical visible light photocatalyst due to their high photocatalytic activity.

Reference:

1. Lingling Sun, Guohong Wang, Ruirui Hao, Solvothermal fabrication and enhanced visible light photocatalytic activity of Cu₂O-reduced graphene oxide composite microspheres for photodegradation of Rhodamine B.
2. Sana Frindy, Mika Sillanpää, Synthesis and application of novel α -Fe₂O₃/graphene for visible-light enhanced photocatalytic degradation of RhB.
3. Wang, Aolan; Li, Xueshan; Zhao, Yibo; Wu, Wei; et al. Elsevier B.V. Preparation and characterizations of Cu₂O/reduced graphene oxide nanocomposites with high photocatalytic performances.
4. Y. Cong, M. Long, Z.W. Cui, X.K. Li, Z.J. Dong, G.M. Yuan, J. Zhang, Anchoring a uniform TiO₂ layer on graphene oxide sheets as an efficient visible light photocatalyst, Appl. Surf. Sci. 282 (2013) 400-407.
5. K. D. R. N. Kalubowila, M. Siyath Gunewardene, Reduction-Induced Synthesis of Reduced Graphene Oxide-Wrapped Cu₂O/Cu Nanoparticles for Photodegradation of Methylene Blue.
6. Shancheng Yana, Bojun Wang, Yi Shi b, Fan Yanga, Dong Hua, Xin Xua, Jiansheng Wu, Hydrothermal synthesis of CdS nanoparticle/functionalized graphene sheet nanocomposites for visible-light photocatalytic degradation of methyl orange

Specific Objectives:

- i. To synthesize the reduced graphene oxide – rGO and the required metal oxides through as above-mentioned reliable method.
- ii. The synthesized metal oxide decorated rGO was best described to ascertain its structural, functional, electrical, and morphological properties utilizing appropriate characterization studies.
- iii. Then they are interfaced with selective organic rhodamine B dye at various dye concentrations, pH values, different catalytic dosages were studied.

iv. After the collected degraded samples were tested its COD and BOD levels and the utilized catalyst were washed to prepare the second cycle of degradation study.

Methodology:

❖ Synthesize of GO-rGO nanosheets:

I. The 3 grams of graphite flacks and 1.5 grams of sodium nitrate were poured into 100 mL of Conc. H_2SO_4 and the mixture were maintained at below $10^\circ C$ for one hour.

II. Then, the 10 grams of $KMnO_4$ salt is gradually added into the mixture after that it could be maintained in an ice bath overnight.

III. After removing the ice bath, the reaction temperature was raised to $80-90^\circ C$, as follows the 100 mL of de-ionized water added very carefully.

IV. Eventually, we poured 30 mL of H_2O_2 solution suddenly. The whole suspension is looking yellowish-brown in color.

V. The GO solution was further centrifuged and washed with dilute HCL, distilled water several times.

VI. The dried GO powder was thermally reduced at different vacuum annealing temperatures.

❖ Synthesize of Metal oxide nanoparticles:

I. The Iron (III) chloride was dissolved in 100 mL of de-ionized water, and the mixture was maintained at $80^\circ C$ for a few minutes.

II. Then, the prepared W. Tintoria leaf extract was added to the mixture, after sometimes the solution will be reduced to precipitated.

III. The suspension was washed, dried, and calcinated for 3 hrs at $400^\circ C$.

IV. Eventually, the synthesized rGO and metal oxide nanoparticles are dissolved in ethanol, sonicated for 2 hrs.

12. Social relevance and usefulness of the proposed research :

We have already discussed the environmental consequences of the most hazardous textile dyes. This type of difficulty is widespread in India. However, in Tamil Nadu, graphene-based and metal oxide-based Nano-catalysts are widely used and regarded as

efficient in treating wastewater/industrial effluents catalysts. It has the potential to significantly reduce water demand in some densely populated areas.

13. Expected outcome of the Research work :

The use of metal oxide anchored graphene nanocomposite will also reduce water demand issues, as well as introduce several methods to treat dye contaminated water in agricultural water usages. I hope to work with various rare earth and MOF-decorated graphene sheets in the future. As a result, I'm hoping that the current proposal addresses future concerns.

14. Details of the Research guide.

Name : Dr. M. Jothibas,
Designation : Assistant Professor & Research Advisor
Department : Physics
College : TBML College, Porayar, 609 307
M.Phil. Guidance : i. Guided - 8
ii. Ongoing - 2
Ph.D. Guidance : i. Ph.D. Completed - 4
ii. Ph.D. Ongoing - 4
Expertise : Semiconducting Thin films – Nanotechnology -
Supercapacitor- Photocatalysis-Gas sensing-
Bio-sensing.
Experience : i. Teaching 15 Years
ii. Research 12 Years
Conference/Seminar Attend: i. International - 30
ii. National – 20
Number of Published Paper. : 77
Reviewer on the Journals. : i. More than 25 journals in Elsevier &
Springer
Invited Talk : 04
Awards Received : i. Best Research Award - 2018
ii. Best Teacher Award - 2019

15. Facilities available at the college for the research work proposed:

Magnetic stirrers,

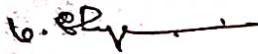
Hot air oven,
Sample Centrifuge machine,
Incubator,
Muffle furnace,
Ultrasonicator,
Tubular furnace,
Hydrothermal Autoclave,
Dip coater,
Internet facilities,

16. Any other relevant information: NIL

Place: Porayar
Date: 25/02/2021



Signature of the Applicant



Signature of the Guide

Dr. M. JOTHIBAS, Ph.D.
Assistant Professor & Research Advisor
Department of Physics
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Signature of
Head of the department
Dr. P.C. Jobs Prabakar, Ph.D.,
Associate Professor & Head
Department of Physics
T.B.M.L. College, Porayar - 609 307.
Nagai Dt. Tamilnadu.



Signature of the Principal / Head
of the institution with seal -

PRINCIPAL
T.B.M.L. COLLEGE
PORAYAR - 609 307