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3.5.1

Number of functional MoUs/linkages with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years.

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Dr. Pradeepan Periyat, Assistant Professor

CERTIFICATE OF COLLABORATION

This is to certify that the Dr. Jithesh K, Assistant Professor, Department of Chemistry, Sree Narayana College Kannur is actively collaborating with Dr. Pradeepan Periyat, Assistant Professor Department of Chemistry, University of Calicut in various academic and research activities for the academic year 2019-2020.

1. Co-supervising post-graduate and research students
2. Knowledge sharing though faculty exchange
3. Undertaking research projects
4. Publication Research papers in International Journals

Dr. Pradeepan Periyat

Department of Chemistry

University of Calicut

Kozhikode

01-06-2019

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Sustainable Energy & Fuels

PAPER

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One-pot synthesis of g-C_3N_4/MnO_2 and g-C_3N_4/SnO_2 hybrid nanocomposites for supercapacitor applications

Jithesh Kavil,[a] P. M. Anjana,[b] Pradeepan Periyat*[a] and R. B. Rakhi *[b]

Carbon materials with layered structures with their unique surface area and charge transport properties have been attracting significant attention as electrode materials in renewable energy storage devices. The rapid agglomeration of layered materials during electrochemical processes reduces their shelf life and specific capacitance, which can be prevented by the introduction of suitable spacers between the layers. Herein, we report the electrochemical performance of MnO_2 and SnO_2 metal oxide spacers incorporated layered graphitic carbon nitride g-C_3N_4 in a symmetric two electrode configuration. The as-prepared g-C_3N_4/MnO_2 and g-C_3N_4/SnO_2 hybrid nanocomposites act as efficient electrode materials for symmetric supercapacitors. The performance of the electrode materials is compared with that of bare g-C_3N_4. A remarkable increase in specific capacitance was obtained for the g-C_3N_4/MnO_2 composite electrode (174 F g^{-1}) when compared to the bare g-C_3N_4 electrode (50 F g^{-1}) and g-C_3N_4/SnO_2 electrode (64 F g^{-1}). At a constant power density of 1 kW kg^{-1} the symmetric supercapacitors based on g-C_3N_4, g-C_3N_4/SnO_2, and g-C_3N_4/MnO_2 electrodes exhibited energy densities of 6.9, 8.8 and 24.1 W h kg^{-1} respectively.

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1. Introduction

The storage of renewable energy and its release upon demand has been a significant technological matter of contention in recent years.[1,2] Lithium-ion (Li-ion) batteries have been successful for the storage of renewable energy with high energy density.[3,4] However, next generation hybrid vehicles, regenerative braking systems, and high power electronic devices demand high power density, large cycle life, and remarkably high safety and low cost. Supercapacitors have been widely employed as an alternative or in support of Li-ion batteries to address these demands.[5,6] Supercapacitors possess much higher power density, excellent cycle stability, a wide temperature range of performance, intrinsically safe charge storage mechanism and they can be charged and discharged in seconds.[7,8] Supercapacitors store charges either non-faradaically (EDLC capacitors) or faradaically (pseudocapacitors).[9]

Nanocarbon materials such as activated carbon, carbon nanotubes, reduced graphene oxide and graphene oxide are widely used as electrode materials in EDLCs due to their high surface area and electronic conductivity.[10] Nitrogen or sulphur doping in carbon-based materials is usually carried out to increase the wettability of the electrode surface with the electrolyte.[11,12] However, nonmetal doping creates chemical inhomogeneity and thereby reduces the shelf life of the electrode material.

Graphitic carbon nitride g-C_3N_4 has emerged as an alternative for purely carbon-based EDLC electrode materials owing to its low cost, chemical and mechanical stability and intrinsically high nitrogen content.[13] The lone pair of electrons present in the N atom of the ring structure of g-C_3N_4 induces more polarity in the molecule and enhances the wettability and the charge carrier mobility of the material.[14]

Bulk g-C_3N_4 exhibits a very low EDLC specific capacitance of 71 F g^{-1} and 81 F g^{-1} at a current density of 0.5 A g^{-1} and 0.2 A g^{-1} respectively due to its inherently low specific surface area and conductivity.[15] Reports suggest that the electrochemical properties of bulk g-C_3N_4 can be enhanced dramatically by the incorporation of pseudocapacitive phases into the matrix of bare g-C_3N_4 which will facilitate the charge transport by a synergistic effect between faradaic and non-faradaic processes of electron transport.[13,14]

Transition metal oxides (TMOs) such as, RuO_2, MnO_2, V_2O_5, TiO_2, SnO_2 *etc.* and Prussian blue (PB) are widely used as pseudocapacitive electrode materials. An ultralong V_2O_5@-conducting polypyrrole composite exhibited enhanced supercapacitor performance along with superior rate capability and improved cycling stability.[16] A dual-jetting fabrication technique was reported on the synthesis of PB and its analogues

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Development of 2D nano heterostructures based on g-C_3N_4 and flower shaped MoS_2 as electrode in symmetric supercapacitor device

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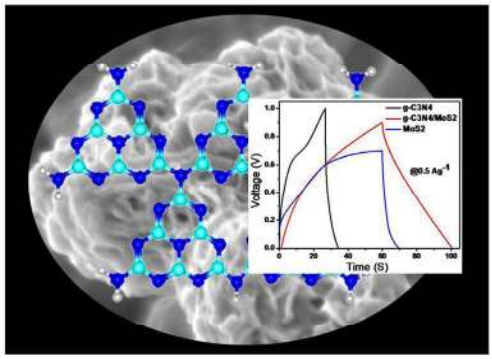
GRAPHICAL ABSTRACT



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ABSTRACT

g-C_3N_4 with plenty of lone pair electrons on the two dimensional (2D) lamellar structures have attracted remarkable attention as an electrical double layer (EDLC) supercapacitor electrodes due to their surface polarity and wettability with electrolyte molecule. However, the agglomeration of the exfoliated g-C_3N_4 sheets during the electrochemical process curtails their accessible electroactive surface area so that specific capacitance get reduces considerably. Here in for the first time in the literature, we report a 2D nanohybrid structure of g-C_3N_4/MoS_2 having attractive electrochemical properties than bare g-C_3N_4 and MoS_2, owing to the wonderful flower shaped morphology of the synthesized pseudocapacitive semiconducting MoS_2 phase which acts as spacers in between the layers of g-C_3N_4. The specific capacitance of bare g-C_3N_4 and $MoS_2$is 10 Fg^{-1} and 14 Fg^{-1} respectively however hybrid material g-C_3N_4/MoS_2 exhibits a specific capacitance value of 45.5 Fg^{-1}. This remarkable hike in specific capacitance can be attributed to the synergistic effect of both faradaic and non-faradaic process of energy storage.

1. Introduction

As the demand for renewable energy sources for fulfilling the future energy needs of the world is urgently on the rise, the energy storage has been a bottleneck in the renewable energy market and there is a global search for technically viable energy storage devices. Although Lithium-ion batteries have been used as an excellent energy storage device it is unsuitable for catering the huge power needs of modern electronic devices and hybrid vehicles [1,2]. The development of novel materials with high energy density as batteries and power densities as supercapacitors is the present-day challenge among the scientific

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Recent developments in the adsorptive removal of heavy metal ions using metal-organic frameworks and graphene-based adsorbents

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ABSTRACT

Clean and potable water is a growing concern around the globe. Among the different water pollutants, heavy metal ions pose a serious health concern to all living beings. The quest for new adsorbents to remove heavy metal ions received a boost with the development in the field of metal-organic framework (MOF). The advancement in synthetic strategies and designing of MOF enabled the researchers to tune the adsorption characteristics and tailor the material specific to a heavy metal ion. Similar to MOF, graphene-based two-dimensional and three-dimensional materials are also promising due to the diverse functionalization possibilities and cost-effectiveness. There had been growing interest in applying MOF and graphene-based materials for the removal of heavy metal ions in the past decade. This review summarizes these developments in detail.

1. Introduction

The scarcity of clean water has been an ever-rising concern for humanity. The factors such as urbanization, population growth, industrial production, climate change, uncontrolled mining, etc., are the major contributions to the deterioration of water quality [1]. As we all know, the most common and highly dangerous water pollutants are heavy metals [2–4]. Based on the health importance, heavy metals are classified into four categories such as essential metals (Cu, Zn, Co, Cr, Mn, and Fe), non-essential metals (Ba, Al, Li, and Zr), less toxic metals (Sn and As) and highly toxic metals (Hg, Cd, and Pb) [5]. Due to the extreme health hazards of heavy metal pollution, the harmful effect of metal ions and their removal methods has been extensively studied [6–10].

The conventional water treatment techniques include coagulation-flocculation, solvent extraction, reverse osmosis, electrodialysis, ion flotation, ion exchange, and adsorption [11–17]. Among all these methods, adsorption is the most accepted and widely used method due to its simplicity and efficiency. The various adsorbents include activated carbon, chitosan, zeolites, and clays [18–21]. Among the various adsorbents, activated carbon is the most preferred adsorbent due to its low cost and availability [22,23]. However, the disordered structure of amorphous carbon restricts the fundamental studies and structural optimization for improved removal performance [24]. Therefore there is a decline in the acceptability of activated carbon in the large-scale application for water treatment.

With the recent growth of nanotechnology, a new class of adsorbents has emerged, which has much more efficiency and selectivity when compared to conventional adsorbents [25]. Such nano-adsorbents include carbon nanotubes [26–28], iron oxides [29,30], MOFs [31,32], graphene-based materials [33,34], manganese dioxide-based nanomaterials [35,36] etc. These nano-adsorbents are promising candidates in environmental remediation due to their high surface to volume ratio, surface modifiability, reversibility, biocompatibility, and selectivity. The surface modification of nano-adsorbents is known to enhance the selectivity of nano-adsorbents towards a particular pollutant [37].

MOFs are considered to be an excellent platform for removing toxic materials from water because of their fascinating structure and salient physical properties like tunable pore size, large pore volume, high specific surface area, and the possibility of case-specific tailoring of basic molecular architecture [38]. The structure of a MOF can be engineered by the careful choice of a metal ion and an organic linker. By grafting various functional groups such as those bearing different polarity, acidity, hydrophilicity, and by tuning the size of the organic linkers, respectively, the pore sizes and pore/surface properties of MOFs can be adjusted. Functionalization can be achieved by using organic linkers during the synthesis or by a post-synthetic modification route. Post-synthetic modification is an effective and practical tool for the modification of the structure and properties of MOFs. Functionalization

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1. Co-supervising post-graduate and research students
2. Knowledge sharing though faculty exchange
3. Undertaking research projects
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One-pot synthesis of g-C_3N_4/MnO_2 and g-C_3N_4/SnO_2 hybrid nanocomposites for supercapacitor applications

Jithesh Kavil,[a] P. M. Anjana,[b] Pradeepan Periyat*[a] and R. B. Rakhi *[b]

Carbon materials with layered structures with their unique surface area and charge transport properties have been attracting significant attention as electrode materials in renewable energy storage devices. The rapid agglomeration of layered materials during electrochemical processes reduces their shelf life and specific capacitance, which can be prevented by the introduction of suitable spacers between the layers. Herein, we report the electrochemical performance of MnO_2 and SnO_2 metal oxide spacers incorporated layered graphitic carbon nitride g-C_3N_4 in a symmetric two electrode configuration. The as-prepared g-C_3N_4/MnO_2 and g-C_3N_4/SnO_2 hybrid nanocomposites act as efficient electrode materials for symmetric supercapacitors. The performance of the electrode materials is compared with that of bare g-C_3N_4. A remarkable increase in specific capacitance was obtained for the g-C_3N_4/MnO_2 composite electrode (174 F g^{-1}) when compared to the bare g-C_3N_4 electrode (50 F g^{-1}) and g-C_3N_4/SnO_2 electrode (64 F g^{-1}). At a constant power density of 1 kW kg^{-1} the symmetric supercapacitors based on g-C_3N_4, g-C_3N_4/SnO_2, and g-C_3N_4/MnO_2 electrodes exhibited energy densities of 6.9, 8.8 and 24.1 W h kg^{-1} respectively.

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Transition metal oxides (TMOs) such as, RuO_2, MnO_2, V_2O_5, TiO_2, SnO_2 *etc.* and Prussian blue (PB) are widely used as pseudocapacitive electrode materials. An ultralong V_2O_5@-conducting polypyrrole composite exhibited enhanced supercapacitor performance along with superior rate capability and improved cycling stability.[16] A dip coating fabrication technique was reported on the synthesis of PB and its analogues

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g-C_3N_4/CuO and g-C_3N_4/Co_3O_4 nanohybrid structures as efficient electrode materials in symmetric supercapacitors

Jithesh Kavil,[a] P. M. Anjana,[bc] Deepak Joshy,[a] Ameya Babu,[a] Govind Raj,[d] P. Periyat*[a] and R. B. Rakhi *[bc]

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Metal oxide dispersed graphitic carbon nitride hybrid nanocomposites (g-C_3N_4/CuO and g-C_3N_4/Co_3O_4) were prepared *via* a direct precipitation method. The materials were used as an electrode material in symmetric supercapacitors. The g-C_3N_4/Co_3O_4 electrode based device exhibited a specific capacitance of 201 F g^{-1} which is substantially higher than those using g-C_3N_4/CuO (95 F g^{-1}) and bare g-C_3N_4 electrodes (72 F g^{-1}). At a constant power density of 1 kW kg^{-1}, the energy density given by g-C_3N_4/Co_3O_4 and g-C_3N_4/CuO devices is 27.9 W h kg^{-1} and 13.2 W h kg^{-1} respectively. The enhancement of the electrochemical performance in the hybrid material is attributed to the pseudo capacitive nature of the metal oxide nanoparticles incorporated in the g-C_3N_4 matrix.

Introduction

Renewable energy storage and its supply upon demand have been a major challenge for researchers owing to the short life span and poor power delivery of conventionally used lithium-ion batteries.[1] The supercapacitor has been recognized as a suitable storage device that can be used in combination with batteries to mitigate the power delivery problems associated with batteries.[2,3] Supercapacitors possess excellent performance recyclability due to the absence of any mass transfer between the electrodes.[4] Carbon-based electrode materials have been used conventionally in supercapacitors owing to their high surface area and storage capacity.[5,6] Nitrogen-doped carbon allotropes emerged recently as supercapacitor electrodes, which show excellent electrode electrolyte interaction due to the presence of lone pair electrons on the nitrogen atom.[7]

Graphitic carbon nitride (g-C_3N_4) is considered as an intrinsically nitrogen-rich system with lamellar structure. It is the most stable allotrope of carbon nitrides at ambient atmosphere, but it also has rich surface properties that are attractive for many applications including supercapacitor electrode and hydrogen evolution photocatalyst.[8] The polymeric structure of g-C_3N_4 arises from the repetition of tri-*s*-triazine (symm. 1,3,5 triazine) units and the 2D lamellar structure arises from the weak van der-Waals interaction between the layers. The lone pair of electron on nitrogen could provide surface polarity on the electrode material and that could offer several binding sites for the electrolyte ions to interact with the electrode surface.[9] However, the semiconducting nature, low surface area and the agglomerated layer structure limit its application as a supercapacitor electrode.[10]

As in other carbon electrodes, the charge storage in g-C_3N_4 is due the formation of electrical double layer at the electrode–electrolyte interface (EDLC) which is non-faradaic in nature. However the pseudo capacitive behavior in transition metal oxides (TMO), sulphides and conducting polymers arises due to the fast and reversible redox process between the electroactive material and electrolyte molecule (faradaic process).[11–15] Thus TMO with pseudocapacitive nature can be suitably coupled with g-C_3N_4 layer structure to mitigate the limitations of bare g-C_3N_4 electrodes.[16]

The commonly used transition metal oxides are ruthenium oxide,[17] manganese dioxide,[18] tungsten oxide,[19] nickel oxide,[20] *etc.* Among them, Co_3O_4 and CuO have received a great deal of attention due to their economically viable and environmentally friendly nature.[21,22] Moreover, as reported by Zhou *et al.* Co_3O_4 shows a very high theoretical capacitance of 3560 F g^{-1} with an excellent shuttling between its Co^{2+} and Co^{3+} ions during electrochemical process.[23,24] In a recent report by Zheng *et al.* mesoporous Co_3O_4 was anchored on the g-C_3N_4 surface, and the composite material showed a specific capacitance value of 780 F g^{-1} at a current density of 1.25 A g^{-1}.[25] In another attempt, Shim *et al.* fabricated a supercapacitor from carbon and CuO anchored g-C_3N_4, which has given a specific capacitance value of 247.2 F g^{-1} at a current density of 1 A g^{-1}.[26] In the available reports, the electrochemical measurements were carried out in three electrode

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Titania nanotubes dispersed graphitic carbon nitride nanosheets as efficient electrode materials for supercapacitors

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Abstract

Herein, we report the synthesis of a hybrid nanocomposite containing one dimensional (1D) TiO_2 nanotube supported over a two dimensional (2D) network of conducting graphitic carbon nitride (g-C_3N_4) nanosheets by a facile hydrothermal strategy. Symmetric supercapacitors based on the hybrid composite electrodes were fabricated and their electrochemical energy storage performances were evaluated and the results were compared with individual component based supercapacitors. The symmetric supercapacitor based on the composite with 1:4 weight ratios of TiO_2 and g-C_3N_4 exhibited a remarkable increase in the specific capacitance in comparison with the individual components. The improvement in electrochemical behavior of the composite sample was attributed to the increase in surface area of the composite due to the spacer effect of titania nanotubes in the 2D g-C_3N_4 nanosheets.

1 Introduction

In the event of the glaring problem of depletion of conventional non renewable energy sources staring at us in the eye, not to mention the huge amounts of pollution caused by such sources, the question of global energy demand for a clean and abundant energy source needs to be solved and requires an imminent solution. With solar energy being at present the best promising alternative, the problem associated with this technology that of storing the energy harvested requires urgent and detailed attention. It is due to this, energy storage devices such as supercapacitors hold the present day researcher's interest. Supercapacitors store energy by incorporating high surface area electrodes and thinner dielectrics rather than chemicals, unlike conventional batteries, and has been considered as an alternative power source because of their durability and ability to charge and discharge within a short period of time [1–3]. Transition metal oxide based pseudocapacitors which store energy via faradaic mechanism are having superior electrochemical capacitance as compared to the carbon based electrical double layer capacitor, as in the latter, the capacitance purely depends on the limited accumulation of charge at electrode–electrolyte interface [4–9]. So far reported successful candidates among the various metal oxides used in supercapacitors, like the ruthenium oxides, has the disadvantage of being expensive and are also toxic [10]. Among the low-cost transition metal oxides, TiO_2 nanotubes (TNT) has shown promise in electrochemical applications recently [5]. TiO_2 holds particular interest due to its environmentally benign chemical nature, stability and low cost [11–14]. Ramadoss et al. reported the use of TiO_2 nanorod arrays prepared on the fluorine doped tin oxide substrates using a facile hydrothermal method and the nanostructures were employed as the electrode materials for supercapacitors with a specific capacitance of f 85 μF cm^{-2} at a scan rate of 5 Mv s^{-1} in the three electrode configuration [15]. Zhou et al. reported the fabrication of supercapacitor electrode using three-dimensional (3D) nanoporous hydrogenated TiO_2 network film on titanium substrate by a controllable method, exhibiting a specific capacitance of 1.07 mF cm^{-2} at a scanrate of 50 mV s^{-1} in the three electrode configuration [16]. Unfortunately, specific capacitance of TiO_2 nanotube supercapacitors are very small and it drops continuously on increasing the scan rate due to its low electrochemical activity and poor conductivity [17–19]. In order to overcome these limitations, several attempts have

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β-$Ni(OH)_2$ supported over g-C_3N_4: A novel catalyst for *para*-nitrophenol reduction and supercapacitor electrode

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Supercapacitor

ABSTRACT

β-$Ni(OH)_2$ supported over g-C_3N_4 was synthesized by two simple approaches. Its catalytic activity in reducing hazardous *para*-nitrophenol (PNP) to the industrially important *para*-aminophenol (PAP) was studied in detail. The applicability of this material as a supercapacitor electrode was also studied. The material shows 100% conversion efficiency with a rate constant of 65.4410×10^{-3} s^{-1}. The catalytic efficiency and the supercapacitor electrode behaviour of the material can be explained based on the structure of β-$Ni(OH)_2$ nanoparticle and the synergy between β-$Ni(OH)_2$ and g-C_3N_4.

Introduction

There has been a global awareness of green chemical technologies and sustainable energy solutions in the last decade. Green energy technology and the availability of drinking water constitute the core of sustainable development goals (SDGs) [1]. These modern energy and environmental goals have opened a new world of opportunities and challenges for nanotechnology. Scientists and stakeholders are scaling up their innovations and investments in nanomaterials that can be employed as functional materials in renewable energy conversion, storage, water sanitation, green chemical conversions, etc [2].

The marine ecosystem is an integral part of sustainable growth, and its contamination leads to the development of 'dead zones' with very low oxygen concentrations [3]. Marine resources are alarmingly threatened due to man-made pollutants, including fertilizers, oilspills, pigments, etc. The nitroaromatic compounds form an important class of pollutants. They are extensively used to produce pigment dyes, pharmaceuticals, explosives, pesticides, etc., and is released into the environment in large quantities [4]. Agricultural and industrial wastewater containing nitroaromatic compounds can cause serious health hazards to animals and plants [5,6]. Among the different nitroaromatic compounds, the most widely used compound is *para*-nitrophenol (PNP). PNP can easily accumulate in the surface and groundwater systems as it is highly stable and non-biodegradable [7]. According to The US Environmental Protection Agency, the upper limit of PNP in drinking water is 10 ppb [6]. Hence, efficient methods for the removal of PNP from water are required.

The hydrogenation of PNP to *para*-aminophenol (PAP) has attracted a lot of interest in recent years. The process removes PNP through its conversion to PAP. PAP has a profound use in analgesic and antipyretic drugs, photographic developers, corrosion inhibitors, and hair dyeing agents [8]. Catalytic reduction of PNP using sodium borohydride ($NaBH_4$) in the presence of nanoparticles of noble metals (Pd, Ag, Pt, Au), non-noble metals (Co, Ni, Cu) and bi-metallic alloys has been widely studied [9–15]. To make the reduction process cost-effective, there were attempts to replace the metal catalysts with transition metal oxide nanoparticles [16,17]. Among the different metal oxides, nickel oxide has been reported to have the best catalytic efficiency compared to iron and cobalt oxides [18]. However, the nickel oxide nanoparticle surface tends to be less stable, especially under moist conditions leading to the growth of a nickel hydroxide layer on its surface [19]. Hence it is better to engineer nickel hydroxide nanoparticles as a catalyst for the reduction of PNP. Previous studies using α-$Ni(OH)_2$ shows that the material exhibited catalytic performance. The catalytic efficiency of α-$Ni(OH)_2$ depends on the extent of exposure of Ni^{2+} ions to the reactant species. Since the α-$Ni(OH)_2$ has a layered structure, the exposure to Ni^{2+} for the reactant species can be tuned by adjusting the morphology, specific surface area and the interlayer spacing between

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Available online 29 August 2022

Investigation of the device Performance in 1T and 2H Phase of MoS_2 based Symmetric Supercapacitors

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b. Material Sciences and Technology Division, CSIR- National Institute of Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram, Kerala 695019, India
c. Department of Chemistry, University of Calicut, Thenhipalam, Kerala 673635, India
d. Department of Chemistry, Malabar Christian College, Calicut, Kerala, 673001, India
e. Department of Environmental Studies, Kannur University, Kannur, Kerala 670567, India

To be communicated in 2024

Abstract

MoS_2 based transition metal dichalcogenide electrodes have received great deal of attention as electrode in energy storage devices. However the bulk phase of MoS_2 (2H) with semiconducting nature suffers inherently low electrochemical properties due to small surface area and electrical conductivity. Conducting phase of MoS_2 (1T) have relatively high surface area due to the two dimensional lamellar structure and have excellent conductivity. In the present work both semiconducting and conducting phases of MoS_2 were synthesized by hydrothermal method. Materials were employed as electrode in symmetric super capacitor devices in 1M KOH electrolyte. Electrochemical studies indicates that the supercapacitor device fabricated from 1T MoS_2 exhibited a specific capacitance of 510 Fg^{-1} which is fivefold greater than the performance of 2H MoS_2.

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Indian Institute of Technology Bombay
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Cc: Vinu Joseph <vtomjoseph@gmail.com>

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on

27-02-2020 Thursday

at

Seminar Hall, SN College, Kannur

10.00 am

Official Launch by

HON. PADMASHRI MEENAKSHI GURUKKAL

(KADATHANAD KALARI SANGHAM, VADAKARA)

In the presence of:

DR. SIVADASAN THIRUMANGALATH
(PRINCIPAL, SN COLLEGE, KANNUR)

SRI. ARAYAKKANDY SANTHOSH
(S N TRUST EXECUTIVE MEMBER & KALARIPPAYATTU PRACTITIONER)

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DR C GANGADHARAN

PROGRAMME

9.00 am : REGISTRATION

9.30 am : INAUGURAL

Welcome	: Dr C P Satheesh (Martial Arts Researcher & Silambam Workshop Coordinator Secretary, WSSA, Kerala State)
Presidential Address	: Sri. M E Sureshan (Chairman, Kadathanad Kalari Vidya Peetam & Patron, WSSA, Kerala State)
Inaugural	: Sri. Sreedharan K (Chairman, Vadakara Municipality)
Chief Guest	: Sri. Silambam S Sudhakaran BA (Founder President, WSSA)
Felicitations	: Dr Sheik Usman MA,Phd (Technical Director, WSSA)
	: Smt.KTK Chandri (Ward Councillor)
	: Sri. Silambam M G Sekar (Joint Gen.Secr, WSSA)
	: Sri. K Mohan Kumar Bcom (Treasurer, WSSA)
	: Sri. A K Parthibhan BA (Org. Secr, WSSA)
	: Sri.T Dhanapal BBA (Referee Chairman, WSSA)
	: Sri. K V Muhammed Gurukkal (Gurukkals Ayurveda Kalari Marma Chikilsa Kendram, Vadakara)
	: Dr C Gangadharan (Martial Arts Researcher & Writer)
	: Sri. K Mahithan (Treasurer, Kadathanad Kalari Vidya Peetam)
Vote of Thanks	: Sri. Vinod Kuttiyil (Secretary, Kadathanad Kalari Vidya Peetam & President WSSA, Kerala State)

10.45 am : TEA BREAK

11.00 am to 1.00 pm : Technical Session 1
(Chuvadukal, Vadivukal, Varshaikal)

1.00 pm to 1.45 pm : Lunch Break

1.45 pm To 2.30 pm : Origin,History & Aesthetics of Silambam

2.30 pm to 3.30 pm : Technical Session 2
(Silambam Demonstration & Training)

3.30 pm to 4.30 pm : Technical Session 3
(Adimurai, Alankara Silambam, Por Silambam)

4.30 pm to 5.00 pm : Interaction, Certificate Distribution & Valedictory

കേരളം केरल KERALA

CL 039713

MEMORANDUM OF UNDERSTANDING (MoU)

FOR

ACADEMIC COOPERATION

This Memorandum of Understanding(MoU) agreement is executed on this 25th day of October 2019

BETWEEN

Ms. Nayana Sahadevan, daughter of Sri. N. Sahadevan, aged 31 years, Head, PG Department of Biotechnology, Chinmaya Arts & Science College for Women, Chala, Kannur, now residing at 'Madhur', P.O. Kakkad, Kannur-670005 on the first part (here in after called as first party)

AND

Dr. Prasad B.O., son of Sri. C. Balakrishnan, aged 37 years, Head, Department of Zoology, Sree Narayana College, Kannur, now residing at F4/23, Kairali Nagar, Thottada P.O., Kannur -670007 on the second part(here in after called as second party)

Principal, Chinmaya Arts & Science College for women. Chala.

25/10/19

DISTRICT TREASURY 23 OCT KANNUR

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WHERE AS the first party who is the Head of the PG Department of Biotechnology and authorised representative of Chinmaya Arts & Science College for Women, Chala, Kannur, a self-financing college run by CMECT, Kannur has expressed her willingness to the second party who is the Head of the Department of Zoology and authorised representative of Sree Narayana College, Kannur, an aided college run by Sree Narayana Trust institutions.

To establish relation between the two educational institutions, to enhance cooperation between the two departments for academic activities and to cooperate with each other in the process of inculcating higher level knowledge and sharing resources and experiences for the benefit of students of both the institutions.

AND WHEREAS the second party has accepted the proposal believing that the, academic tie up between the institutions would foster and support the academic projects and resources from both the colleges for joint co-development of innovative services. This agreement for the academic tie up between the institutions for a period of three years from the date of this agreement upon the terms and conditions here in after mentioned.

8/10/24 Principal, Chinmaya Arts & Science College for Women, Chala

24-10-19 & 100

DISTRICT TREASURY KANNUR 24 OCT 2019

23/10/19

CHINMAYA ARTS & SCIENCE COLLEGE FOR WOMEN CHALA, P.O. THOTTADA, KANNUR-670 007

SATHEESH CHERIYAPUTHALATH
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Principal, Sree Narayana College, Kannur
21.10.2024 16:00

NOW THE Memorandum of understanding witnesses as follows:

1. The purpose of this MoU is to develop academic cooperation and to promote mutual understanding between the two educational institutions.
2. Both institutions agree and shall endeavour to promote collaborative activities in academic and research areas of mutual interest on a basis of equality and reciprocity.
3. Utilise the service and expertise of the teachers of the respective colleges for mutual benefit.
4. It is agreed to create a structured forum for peer to peer interaction, experience sharing, and exchange of views among the faculty and students for better networking and synergy.
5. Exchange of students-graduate and undergraduate to attend seminars, exhibitions and workshops conducted by the two institutions.
6. The terms of cooperation for each specific activity implemented under the MoU shall be mutually discussed and agreed upon by both the party.
7. This MoU shall remain in force for a period of three years from the date of this agreement and shall be renewed for a further period on mutual consent of the party.
8. Each institution shall designate a liaison officer to develop and coordinate the specific activities agreed upon.

25/10/19

Signature of the first party

25.10.2019

Signature of the second party

In the presence of the following witnesses:

1. Dr. K.V. Surendran, Principal, Chinmaya Arts & Science College for Women, Chala

25/10/19

CHINMAYA ARTS & SCIENCE COLLEGE FOR WOMEN
CHALA, P.O. THOTTADA, KANNUR-670 007

2. Dr.Sivadasan Thirumangalath, Principal, Sree Narayana College, Kannur

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Sree Narayana College Kannur, P.O. Thottada, Kannur,Kerala , India - 670 007
sncollegekannur@gmail.com 0497 - 2731085
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3.5.1

Number of functional MoUs/linkages with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years.

List and Copies of Documents indicating MoUs / linkage/ Collaborations Yearwise

2020-21

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Sree Narayana College, Kannur, Kerala

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Registration Deadline:
2020 May 21

Co- ordinators

Bivitha T K
9048003802

Dr Ayana N
9447295387

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Principal, Sree Narayana College, Kannur
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About the Programme

Objectives

The course aims

- To promote understanding of the importance of emerging and re-emerging infectious diseases of public health implications and factors contributing to the emergence of infectious agents
- To provide an understanding of emerging viral, bacterial and fungal infectious agents of global importance

Learning Outcomes

On completion of the course the student will be able to:

1. Understand the importance of worldwide emergence and re-emergence of infectious diseases and able to assess the risk factors contributing to disease emergence.
2. List out important emerging infectious diseases of viral, bacterial and fungal etiology posing public health problem
3. Develop knowledge to give awareness to public about the clinical features, transmission and preventive strategies of important emerging bacterial and viral diseases.

COURSE DEVELOPMENT TEAM

Dr. Sarala Gopalakrishnan
Associate Professor of Microbiology, St. Pius X College, Rajapuram

Ms. Prajina P
Assistant Professor of Microbiology, SN College, Kannur

Dr. Ayana N
Assistant Professor of Microbiology, SN College, Kannur

Sri Ramesan C K V
Assistant Professor of Microbiology, SN College, Kannur

Dr. N.V. Vinod
Assistant Professor of Microbiology, St Pius X College, Rajapuram

Dr Sinosh Skariachan
Assistant Professor of Microbiology, St Pius X College, Rajapuram

UG and PG Life Science students can apply

The number of participants is limited to 75

No Registration Fees

Course will be conducted in MOODLE LMS

E certificates will be provided to all participants upon successful completion of course

Last date for Registration is 13th October 2020

Link for Registraion
https://forms.gle/1qprKmUoG8YrL22fA

Scan to register

Advisory Board

Dr. A. Sabu (Associate Prof., School of Life Sciences, Kannur University)

Dr. K. K. Anilkumar (Former Head, Dept. of Microbiology, St. Pius X College, Rajapuram)

Organizing Committee

Dr. K. Ajayakumar (Principal, SN College, Kannur)
Ms.Prajina P (Head of the Dept.)
Dr. Ayana N (Co- ordinator)

For further details contact :

9447295387 ayana2007@gmail.com

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on

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Organized by

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KERALA STATE COUNCIL FOR SCIENCE TECHNOLOGY AND ENVIRONMENT

17-30 OCTOBER 2020

22/09/2020

From

Dr Ayana N

Assistant Professor of Microbiology

Sree Narayana College, Kannur

To

The ~~Director~~ Member Secretary

~~Kerala Biotechnology Commission~~

KSCSTE, Thiruvananthapuram

Sir

I wish to conduct an online short term course on Emerging Infectious Diseases for two weeks intended for UG students in Life Sciences in asynchronous mode associating with team of Microbiology teachers. It would be highly appreciable if your institution had collaborated with this event and your good will of your institution may be used for better outreach of the programme. Fund management will be done by our Department.

Thanking You

Yours faithfully

Dr Ayana N

Permitted 22/09/2020.

Principal
Sree Narayana College
Kannur

Recommended & forwarded

PRINCIPAL (I/C)

SREE NARAYANA COLLEGE

SATHEESH CHERIYAPUTHALATH
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Principal, Sree Narayana College, Kannur
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Kerala State Council for Science, Technology and Environment

Sasthra Bhavan, Pattom P.O., Thiruvananthapuram - 695 004, Kerala State, India

[illegible]

[illegible]

Fax: 0471 [illegible] e-mail: [illegible]

www.kscste.kerala.gov.in

No. KSCSTE/1152/2020-C4

Thiruvananthapuram
Dated: 09/10/2020

To

Dr.Ayana .N
Assistant Professor of Microbiology
Sree Narayanana College, Kannur.

Sir,

Sub: KSCSTE - Online short term course on Emerging Infectious Diseases - reg.

Ref: Your letter dated 22.09.2020.

Inviting attention to the reference cited, I am to inform you that KSCSTE is pleased to collaborate with the event as proposed.

Yours Faithfully,
S. PRADEEP KUMAR
MEMBER SECRETARY

Approved for Issue

Section Officer

'ഭരണഭാഷ മാതൃഭാഷ'

മെമ്മോ

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യോഗ്യതാ പരീക്ഷയുടെ മാർക്ക് ലിസ്റ്റും, കായിക പരിശീലനത്തിന് ആവശ്യമായ ശാരീരിക ക്ഷമതയുണ്ടന്നു തെളിയിക്കുന്ന അസി. സർജ്ജന്റെ ഗ്രേഡിൽ കുറയാതെയുള്ള ഡോക്ടറുടെ മെഡിക്കൽ സർട്ടിഫിക്കറ്റും 100 രൂപയുടെ മുദ്രപത്രവും, ഈ മെമ്മോയുമായി ഡിസ്ട്രിക്ട് സ്പോർട്സ് കൗൺസിൽ സെക്രട്ടറി മുമ്പാകെ അക്കാഡമി തുറക്കുന്ന അറിയിപ്പ് ലഭിക്കുന്ന മുറക്ക് ഹാജരാകേണ്ടതാണ്. **കോവിഡ് 19 സാഹചര്യത്തിൽ ഈ മെമ്മോ ലഭിച്ച് 7 ദിവസത്തിനുള്ളിൽ ജില്ലാ സ്പോർട്സ് കൗൺസിലിൽ മെയിൽ/ഫോൺ/വാട്സ്ആപ് വഴി ബന്ധപ്പെട്ട് നിങ്ങളുടെ അഡ്മിഷൻ ഉറപ്പ് വരുത്തേണ്ടതാണ്.**

സ്പോർട്സ് അക്കാഡമിയിലേയ്ക്കുള്ള പ്രവേശനം പൂർത്തിയായ ശേഷം താമസത്തിനുള്ള ബഡ്ഷീറ്റ്, ഭക്ഷണം കഴിക്കുന്നതിനുള്ള പാത്രം, കായിക പരിശീലനത്തിനുള്ള വസ്ത്രം, 1000 രൂപ ക്യോഷൻ ഡിപ്പോസിറ്റ് (**ഡിസ്ട്രിക്ട് സ്പോർട്സ് അക്കാഡമികൾക്ക് മാത്രം**) തുടങ്ങിയവ സഹിതം അക്കാഡമികളിലേക്ക് എത്തിച്ചേരേണ്ടതാണ്.

സ്കൂൾ, കോളേജ്, ജില്ലാ സ്പോർട്സ് അക്കാഡമി, എലൈറ്റ് എന്നിവയിലെ നിയമം വളരെ കർശനമായി പാലിക്കേണ്ടതാണ്. അക്കാഡമികളിൽ മൊബൈൽ ഫോൺ ഉപയോഗിക്കുവാനോ സൂക്ഷിക്കുവാനോ പാടുള്ളതല്ല.

ഹോസ്റ്റൽ പ്രവേശനത്തിന് മുൻപ് 100 രൂപയുടെ മുദ്രപത്രത്തിൽ സാക്ഷ്യപ്പെടുത്തേണ്ടതാണ്.

കൂടുതൽ വിവരങ്ങൾക്ക് അതാതു ജില്ലാ സ്പോർട്സ് കൗൺസിലിൽ (താഴെപറയുന്ന ഫോൺ നമ്പരിൽ) ബന്ധപ്പെടേണ്ടതാണ്.

NB : സ്കൂൾ സ്പോർട്സ് അക്കഡമികളിലേക്ക് 2020-21 അക്കാഡമി വർഷത്തിൽ 8-ാം ക്ലാസ്സ്വരേയും പ്ളസ് വൺ പ്രവേശനത്തിന് ഈ അക്കാഡമി വർഷത്തിൽ പ്ളസ്വൺലേക്ക് അഡ്മിഷൻ എടുക്കുന്നവർക്കും മാത്രമായിരിക്കും അഡ്മിഷൻ ലഭിക്കുക

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'ഭരണഭാഷ മാതൃഭാഷ'

മെമ്മോ

സൂചന : കേരള സ്റ്റേറ്റ് സ്പോർട്സ് ഹോസ്റ്റലിലേക്കുള്ള സെലക്ഷൻ സംബന്ധിച്ച്

കേരള സ്റ്റേറ്റ് സ്പോർട്സ് കൗൺസിലിന്റെ 2020-21 അദ്ധ്യായന വർഷത്തിലേയ്ക്കുള്ള സ്പോർട്സ് അക്കാഡമിയിലേക്ക് താങ്കളെ യോഗ്യത ടെസ്റ്റിന്റെറ അടിസ്ഥാനത്തിൽ തെരഞ്ഞെടുത്ത വിവരം അറിയിച്ചുകൊള്ളുന്നു. താഴെ പറയുന്ന ഹോസ്റ്റലിലേയ്ക്കാണ് താങ്കൾക്ക് പ്രവേശനം അനുവദിച്ചിട്ടുള്ളത്.

SN COLLEGE. KANNUR .....സ്കൂൾ/കോളേജ്/ഡിസ്ട്രിക്ട് സ്പോർട്സ് അക്കാഡമി

യോഗ്യതാ പരീക്ഷയുടെ മാർക്ക് ലിസ്റ്റും, കായിക പരിശീലനത്തിന് ആവശ്യമായ ശാരീരിക ക്ഷമതയുണ്ടന്നു തെളിയിക്കുന്ന അസി. സർജ്ജന്റെ ഗ്രേഡിൽ കുറയാതെയുള്ള ഡോക്ടറുടെ മെഡിക്കൽ സർട്ടിഫിക്കറ്റും 100 രൂപയുടെ മുദ്രപത്രവും, ഈ മെമ്മോയുമായി ഡിസ്ട്രിക്ട് സ്പോർട്സ് കൗൺസിൽ സെക്രട്ടറി മുമ്പാകെ അക്കാഡമി തുറക്കുന്ന അറിയിപ്പ് ലഭിക്കുന്ന മുറക്ക് ഹാജരാകേണ്ടതാണ്. **കോവിഡ് 19 സാഹചര്യത്തിൽ ഈ മെമ്മോ ലഭിച്ച് 7 ദിവസത്തിനുള്ളിൽ ജില്ലാ സ്പോർട്സ് കൗൺസിലിൽ മെയിൽ/ഫോൺ/വാട്സ്ആപ് വഴി ബന്ധപ്പെട്ട് നിങ്ങളുടെ അഡ്മിഷൻ ഉറപ്പ് വരുത്തേണ്ടതാണ്.**

സ്പോർട്സ് അക്കാഡമിയിലേയ്ക്കുള്ള പ്രവേശനം പൂർത്തിയായ ശേഷം താമസത്തിനുള്ള ബഡ്ഷീറ്റ്, ഭക്ഷണം കഴിക്കുന്നതിനുള്ള പാത്രം, കായിക പരിശീലനത്തിനുള്ള വസ്ത്രം, 1000 രൂപ ക്വോഷൻ ഡിപ്പോസിറ്റ് (ഡിസ്ട്രിക്ട് **സ്പോർട്സ് അക്കാഡമികൾക്ക് മാത്രം)** തുടങ്ങിയവ സഹിതം അക്കാഡമികളിലേക്ക് എത്തിച്ചേരേണ്ടതാണ്.

സ്കൂൾ, കോളേജ്, ജില്ലാ സ്പോർട്സ് അക്കാഡമി, എലൈറ്റ് എന്നിവയിലെ നിയമം വളരെ കർശനമായി പാലിക്കേണ്ടതാണ്. അക്കാഡമികളിൽ മൊബൈൽ ഫോൺ ഉപയോഗിക്കുവാനോ സൂക്ഷിക്കുവാനോ പാടുള്ളതല്ല.

ഹോസ്റ്റൽ പ്രവേശനത്തിന് മുൻപ് 100 രൂപയുടെ മുദ്രപത്രത്തിൽ സാക്ഷ്യപ്പെടുത്തേണ്ടതാണ്.

കൂടുതൽ വിവരങ്ങൾക്ക് അതാതു ജില്ലാ സ്പോർട്സ് കൗൺസിലിൽ (താഴെപറയുന്ന ഫോൺ നമ്പരിൽ) ബന്ധപ്പെടേണ്ടതാണ്.

NB : സ്കൂൾ സ്പോർട്സ് അക്കഡമികളിലേക്ക് 2020-21 അക്കാഡമി വർഷത്തിൽ 8-ാം ക്ലാസ്സ്വരേയും പ്ലസ് വൺ പ്രവേശനത്തിന് ഈ അക്കാഡമി വർഷത്തിൽ പ്ലസ്വൺലേക്ക് അഡ്മിഷൻ എടുക്കുന്നവർക്കും മാത്രമായിരിക്കും അഡ്മിഷൻ ലഭിക്കുക

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സൂചന : **കേരള സ്റ്റേറ്റ് സ്പോർട്സ് ഹോസ്റ്റലിലേക്കുള്ള സെലക്ഷൻ സംബന്ധിച്ച്**

കേരള സ്റ്റേറ്റ് സ്പോർട്സ് കൗൺസിലിന്റെ 2020-21 അദ്ധ്യായന വർഷത്തിലേയ്ക്കുള്ള സ്പോർട്സ് അക്കാഡമിയിലേക്ക് താങ്കളെ യോഗ്യത ടെസ്റ്റിന്റെ അടിസ്ഥാനത്തിൽ തെരഞ്ഞെടുത്ത വിവരം അറിയിച്ചുകൊള്ളുന്നു. താഴെ പറയുന്ന ഹോസ്റ്റലിലേയ്ക്കാണ് താങ്കൾക്ക് പ്രവേശനം അനുവദിച്ചിട്ടുള്ളത്.

SN COLLEGE KANNUR .....സ്കൂൾ/കോളേജ്/ഡിസ്ട്രിക്ട് സ്പോർട്സ് അക്കാഡമി

യോഗ്യതാ പരീക്ഷയുടെ മാർക്ക് ലിസ്റ്റും, കായിക പരിശീലനത്തിന് ആവശ്യമായ ശാരീരിക ക്ഷമതയുണ്ടന്നു തെളിയിക്കുന്ന അസി. സർജ്ജന്റെ ഗ്രേഡിൽ കുറയാതെയുള്ള ഡോക്ടറുടെ മെഡിക്കൽ സർട്ടിഫിക്കറ്റും 100 രൂപയുടെ മുദ്രപത്രവും, ഈ മെമ്മോയുമായി ഡിസ്ട്രിക്ട് സ്പോർട്സ് കൗൺസിൽ സെക്രട്ടറി മുമ്പാകെ അക്കാഡമി തുറക്കുന്ന അറിയിപ്പ് ലഭിക്കുന്ന മുറക്ക് ഹാജരാകേണ്ടതാണ്. **കോവിഡ് 19 സാഹചര്യത്തിൽ ഈ മെമ്മോ ലഭിച്ച് 7 ദിവസത്തിനുള്ളിൽ ജില്ലാ സ്പോർട്സ് കൗൺസിലിൽ മെയിൽ/ഫോൺ/വാട്സ്ആപ് വഴി ബന്ധപ്പെട്ട് നിങ്ങളുടെ അഡ്മിഷൻ ഉറപ്പ് വരുത്തേണ്ടതാണ്.**

സ്പോർട്സ് അക്കാഡമിയിലേയ്ക്കുള്ള പ്രവേശനം പൂർത്തിയായ ശേഷം താമസത്തിനുള്ള ബഡ്ഷീറ്റ്, ഭക്ഷണം കഴിക്കുന്നതിനുള്ള പാത്രം, കായിക പരിശീലനത്തിനുള്ള വസ്ത്രം, 1000 രൂപ ക്വോഷൻ ഡിപ്പോസിറ്റ് **(ഡിസ്ട്രിക്ട് സ്പോർട്സ് അക്കാഡമികൾക്ക് മാത്രം)** തുടങ്ങിയവ സഹിതം അക്കാഡമികളിലേക്ക് എത്തിച്ചേരേണ്ടതാണ്.

സ്കൂൾ, കോളേജ്, ജില്ലാ സ്പോർട്സ് അക്കാഡമി, എലൈറ്റ് എന്നിവയിലെ നിയമം വളരെ കർശനമായി പാലിക്കേണ്ടതാണ്. അക്കാഡമികളിൽ മൊബൈൽ ഫോൺ ഉപയോഗിക്കുവാനോ സൂക്ഷിക്കുവാനോ പാടുള്ളതല്ല.

ഹോസ്റ്റൽ പ്രവേശനത്തിന് മുൻപ് 100 രൂപയുടെ മുദ്രപത്രത്തിൽ സാക്ഷ്യപ്പെടുത്തേണ്ടതാണ്.

കൂടുതൽ വിവരങ്ങൾക്ക് അതാതു ജില്ലാ സ്പോർട്സ് കൗൺസിലിൽ (താഴെപറയുന്ന ഫോൺ നമ്പരിൽ) ബന്ധപ്പെടേണ്ടതാണ്.

NB : സ്കൂൾ സ്പോർട്സ് അക്കഡമികളിലേക്ക് 2020-21 അക്കാഡമി വർഷത്തിൽ 8-ാം ക്ലാസ്സ്വരേയും പ്ലസ് വൺ പ്രവേശനത്തിന് ഈ അക്കാഡമി വർഷത്തിൽ പ്ലസ്വൺലേക്ക് അഡ്മിഷൻ എടുക്കുന്നവർക്കും മാത്രമായിരിക്കും അഡ്മിഷൻ ലഭിക്കുക

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'ഭരണഭാഷ മാതൃഭാഷ'

150 YEARS OF CELEBRATING THE MAHATMA

KERALA STATE SPORTS COUNCIL

SPORTS KERALA SPORTS FOR LIFE

മെമ്മോ

സൂചന : കേരള സ്റ്റേറ്റ് സ്പോർട്സ് ഹോസ്റ്റലിലേക്കുള്ള സെലക്ഷൻ സംബന്ധിച്ച്

കേരള സ്റ്റേറ്റ് സ്പോർട്സ് കൗൺസിലിന്റെ 2020-21 അദ്ധ്യായന വർഷത്തിലേയ്ക്കുള്ള സ്പോർട്സ് അക്കാഡമിയിലേക്ക് താങ്കളെ യോഗ്യത ടെസ്റ്റിന്റെ അടിസ്ഥാനത്തിൽ തെരഞ്ഞെടുത്ത വിവരം അറിയിച്ചുകൊള്ളുന്നു. താഴെ പറയുന്ന ഹോസ്റ്റലിലേയ്ക്കാണ് താങ്കൾക്ക് പ്രവേശനം അനുവദിച്ചിട്ടുള്ളത്.

SN COLLEGE KANNUR .....സ്കൂൾ/കോളേജ്/ഡിസ്ട്രിക്ട് സ്പോർട്സ് അക്കാഡമി

യോഗ്യതാ പരീക്ഷയുടെ മാർക്ക് ലിസ്റ്റും, കായിക പരിശീലനത്തിന് ആവശ്യമായ ശാരീരിക ക്ഷമതയുണ്ടന്നു തെളിയിക്കുന്ന അസി. സർജ്ജന്റെ ഗ്രേഡിൽ കുറയാതെയുള്ള ഡോക്ടറുടെ മെഡിക്കൽ സർട്ടിഫിക്കറ്റും 100 രൂപയുടെ മുദ്രപത്രവും, ഈ മെമ്മോയുമായി ഡിസ്ട്രിക്ട് സ്പോർട്സ് കൗൺസിൽ സെക്രട്ടറി മുമ്പാകെ അക്കാഡമി തുറക്കുന്ന അറിയിപ്പ് ലഭിക്കുന്ന മുറക്ക് ഹാജരാകേണ്ടതാണ്. **കോവിഡ് 19 സാഹചര്യത്തിൽ ഈ മെമ്മോ ലഭിച്ച് 7 ദിവസത്തിനുള്ളിൽ ജില്ലാ സ്പോർട്സ് കൗൺസിലിൽ മെയിൽ/ഫോൺ/വാട്സ്ആപ് വഴി ബന്ധപ്പെട്ട് നിങ്ങളുടെ അഡ്മിഷൻ ഉറപ്പ് വരുത്തേണ്ടതാണ്.**

സ്പോർട്സ് അക്കാഡമിയിലേയ്ക്കുള്ള പ്രവേശനം പൂർത്തിയായ ശേഷം താമസത്തിനുള്ള ബഡ്ഷീറ്റ്, ഭക്ഷണം കഴിക്കുന്നതിനുള്ള പാത്രം, കായിക പരിശീലനത്തിനുള്ള വസ്ത്രം, 1000 രൂപ ക്യോഷൻ ഡിപ്പോസിറ്റ് (**ഡിസ്ട്രിക്ട് സ്പോർട്സ് അക്കാഡമികൾക്ക് മാത്രം**) തുടങ്ങിയവ സഹിതം അക്കാഡമികളിലേക്ക് എത്തിച്ചേരേണ്ടതാണ്.

സ്കൂൾ, കോളേജ്, ജില്ലാ സ്പോർട്സ് അക്കാഡമി, എലൈറ്റ് എന്നിവയിലെ നിയമം വളരെ കർശനമായി പാലിക്കേണ്ടതാണ്. അക്കാഡമികളിൽ മൊബൈൽ ഫോൺ ഉപയോഗിക്കുവാനോ സൂക്ഷിക്കുവാനോ പാടുള്ളതല്ല.

ഹോസ്റ്റൽ പ്രവേശനത്തിന് മുൻപ് 100 രൂപയുടെ മുദ്രപത്രത്തിൽ സാക്ഷ്യപ്പെടുത്തേണ്ടതാണ്.

കൂടുതൽ വിവരങ്ങൾക്ക് അതാതു ജില്ലാ സ്പോർട്സ് കൗൺസിലിൽ (താഴെപറയുന്ന ഫോൺ നമ്പരിൽ) ബന്ധപ്പെടേണ്ടതാണ്.

NB : സ്കൂൾ സ്പോർട്സ് അക്കഡമികളിലേക്ക് 2020-21 അക്കാഡമി വർഷത്തിൽ 8-ാം ക്ലാസ്സ്വരേയും പ്ലസ് വൺ പ്രവേശനത്തിന് ഈ അക്കാഡമി വർഷത്തിൽ പ്ലസ്വൺലേക്ക് അഡ്മിഷൻ എടുക്കുന്നവർക്കും മാത്രമായിരിക്കും അഡ്മിഷൻ ലഭിക്കുക

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भारतीय खेल प्राधिकरण (युव कार्यक्रम एवं खेल मंत्रालय)
प्रशिक्षण केंद्र : तलाश्शेरी : केरला
സ്പോർട്സ് അതോറിറ്റി ഓഫ് ഇന്ത്യ, സ്പോർട്സ് യുവജനകാര്യമന്ത്രാലയം
പരിശീലനകേന്ദ്രം, തലശ്ശേരി, കേരളം
SPORTS AUTHORITY OF INDIA (Ministry of Youth Affairs & Sports)
TRAINING CENTRE : THALASSERY : KERALA 670 101
ईमेल Email:saitly@yahoo.com, saisagtly@gmail.com
दूरभाष Telephone : 0490 2324900 फाक्स Fax : 0490 2324900

नम्बर No.10/SAI/TLY/TRG/2020-21/99 दिनांकDate.01/10/2020

सेवा में To
The Registrar
Kannur University

(Through the Principal, S.N College, Kannur)

महोदय Sir

विषय Sub. Admission for Degree course for sports persons of SAI - reg
Ref.No.Kannur University Office order No.Aedad/2/Admn-2001
Sports stars 19/06/2003.

With reference to the above cited subject, the following Sports persons of this Centre have applied for First year Degree Course in S.N. College, Kannur, in various subjects. All of them have achievements in National/State level.

SLNo	Name	Course	Game
1	YEDURAJ	B.A English Literature / BBA.	Gymnastics
2	ADWAID P	B.A English / BBA / B. Com	Fencing

It is requested that the above students may be admitted in S.N College, Kannur as early as possible.

Thanking you,

आपका आभारी Yours faithfully,

28/10/2020

टी। बालाचंद्रन(T. Balachandran)
केंद्र प्रभारी /Centre Incharge

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

DEPARTMENT OF BOTANY & RESEARCH CENTRE
SREE NARAYANA COLLEGE, KANNUR
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Ref: Bot 20/2021

Date: 05.01.2021

CERTIFICATE OF COLLABORATION

This is to certify that the Department of Botany, Nirmalagiri College, Kuthuparamba, is actively collaborating with the Department of Botany of our institution in various academic and research activities for the academic years 2021 – 2022.

1. Undertaking research projects
2. Co-supervising post-graduate and research students (student exchange for research)
3. Knowledge sharing through faculty exchange
4. Conducting collaborative add-on/certificate programmes.
5. Conducting capacity building workshops.

Dr. K.P. PRASANTH M.Sc, B.Ed, PGDESD, Ph.D
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This is to certify that the PG Department of Commerce, Mahatma Gandhi College Iritty, Kannur, is actively collaborating with the PG and Research Department of Commerce of our institution in various academic and skill development activities for the academic year 2021-22.

1. Conducting Research Methodology workshops
2. Organizing joint volunteer activities/community service projects.
3. Knowledge sharing through faculty exchange.
4. Conducting collaborative research projects.
5. Project guidance to Post Graduate students and Research Scholars.
6. Collaborative Education programmes.

Head of the Department

Dr. Amutha. R
Assistant Professor & Head
P. G. Department of Commerce
Sree Narayana College, Kannur
Kannur - 670 007, Kerala

(With seal)

SREE NARAYANA COLLEGE DEPARTMENT OF COMMERCE KANNUR-670 007

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1. Co-supervising post-graduate and research students
2. Knowledge sharing though faculty exchange
3. Undertaking research projects
4. Publication Research papers in International Journals

Dr. Pradeepan Periyat

Department of Chemistry

University of Calicut

Kozhikode

01-06-2019

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Dr. Pradeepan Periyat

Department of Chemistry

University of Calicut

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Sustainable Energy & Fuels

PAPER

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One-pot synthesis of g-C_3N_4/MnO_2 and g-C_3N_4/SnO_2 hybrid nanocomposites for supercapacitor applications

Jithesh Kavil,[a] P. M. Anjana,[b] Pradeepan Periyat*[a] and R. B. Rakhi *[b]

Carbon materials with layered structures with their unique surface area and charge transport properties have been attracting significant attention as electrode materials in renewable energy storage devices. The rapid agglomeration of layered materials during electrochemical processes reduces their shelf life and specific capacitance, which can be prevented by the introduction of suitable spacers between the layers. Herein, we report the electrochemical performance of MnO_2 and SnO_2 metal oxide spacers incorporated layered graphitic carbon nitride g-C_3N_4 in a symmetric two electrode configuration. The as-prepared g-C_3N_4/MnO_2 and g-C_3N_4/SnO_2 hybrid nanocomposites act as efficient electrode materials for symmetric supercapacitors. The performance of the electrode materials is compared with that of bare g-C_3N_4. A remarkable increase in specific capacitance was obtained for the g-C_3N_4/MnO_2 composite electrode (174 F g^{-1}) when compared to the bare g-C_3N_4 electrode (50 F g^{-1}) and g-C_3N_4/SnO_2 electrode (64 F g^{-1}). At a constant power density of 1 kW kg^{-1} the symmetric supercapacitors based on g-C_3N_4, g-C_3N_4/SnO_2, and g-C_3N_4/MnO_2 electrodes exhibited energy densities of 6.9, 8.8 and 24.1 W h kg^{-1} respectively.

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1. Introduction

The storage of renewable energy and its release upon demand has been a significant technological matter of contention in recent years.[1,2] Lithium-ion (Li-ion) batteries have been successful for the storage of renewable energy with high energy density.[3,4] However, next generation hybrid vehicles, regenerative braking systems, and high power electronic devices demand high power density, large cycle life, and remarkably high safety and low cost. Supercapacitors have been widely employed as an alternative or in support of Li-ion batteries to address these demands.[5,6] Supercapacitors possess much higher power density, excellent cycle stability, a wide temperature range of performance, intrinsically safe charge storage mechanism and they can be charged and discharged in seconds.[7,8] Supercapacitors store charges either non-faradaically (EDLC capacitors) or faradaically (pseudocapacitors).[9]

Nanocarbon materials such as activated carbon, carbon nanotubes, reduced graphene oxide and graphene oxide are widely used as electrode materials in EDLCs due to their high surface area and electronic conductivity.[10] Nitrogen or sulphur doping in carbon-based materials is usually carried out to increase the wettability of the electrode surface with the electrolyte.[11,12] However, nonmetal doping creates chemical inhomogeneity and thereby reduces the shelf life of the electrode material.

Graphitic carbon nitride g-C_3N_4 has emerged as an alternative for purely carbon-based EDLC electrode materials owing to its low cost, chemical and mechanical stability and intrinsically high nitrogen content.[13] The lone pair of electrons present in the N atom of the ring structure of g-C_3N_4 induces more polarity in the molecule and enhances the wettability and the charge carrier mobility of the material.[14]

Bulk g-C_3N_4 exhibits a very low EDLC specific capacitance of 71 F g^{-1} and 81 F g^{-1} at a current density of 0.5 A g^{-1} and 0.2 A g^{-1} respectively due to its inherently low specific surface area and conductivity.[15] Reports suggest that the electrochemical properties of bulk g-C_3N_4 can be enhanced dramatically by the incorporation of pseudocapacitive phases into the matrix of bare g-C_3N_4 which will facilitate the charge transport by a synergistic effect between faradaic and non-faradaic processes of electron transport.[13,14]

Transition metal oxides (TMOs) such as, RuO_2, MnO_2, V_2O_5, TiO_2, SnO_2 *etc.* and Prussian blue (PB) are widely used as pseudocapacitive electrode materials. An ultralong V_2O_5@-conducting polypyrrole composite exhibited enhanced supercapacitor performance along with superior rate capability and improved cycling stability.[16] A dual-jetting fabrication technique was reported on the synthesis of PB and its analogues

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Development of 2D nano heterostructures based on g-C_3N_4 and flower shaped MoS_2 as electrode in symmetric supercapacitor device

Jithesh Kavil [a,1], Shabeeba Pilathottathil [b,1], Mohamed Shahin Thayyil [b], Pradeepan Periyat [a,*]

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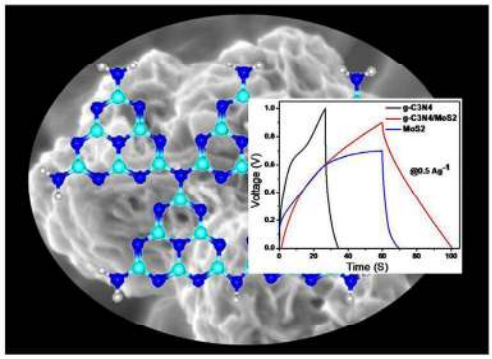
[b] Department of Physics, University of Calicut, Kerala, 673635, Inida

GRAPHICAL ABSTRACT



ARTICLE INFO

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Received 6 September 2018
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ABSTRACT

g-C_3N_4 with plenty of lone pair electrons on the two dimensional (2D) lamellar structures have attracted remarkable attention as an electrical double layer (EDLC) supercapacitor electrodes due to their surface polarity and wettability with electrolyte molecule. However, the agglomeration of the exfoliated g-C_3N_4 sheets during the electrochemical process curtails their accessible electroactive surface area so that specific capacitance get reduces considerably. Here in for the first time in the literature, we report a 2D nanohybrid structure of g-C_3N_4/MoS_2 having attractive electrochemical properties than bare g-C_3N_4 and MoS_2, owing to the wonderful flower shaped morphology of the synthesized pseudocapacitive semiconducting MoS_2 phase which acts as spacers in between the layers of g-C_3N_4. The specific capacitance of bare g-C_3N_4 and $MoS_2$is 10 Fg^{-1} and 14 Fg^{-1} respectively however hybrid material g-C_3N_4/MoS_2 exhibits a specific capacitance value of 45.5 Fg^{-1}. This remarkable hike in specific capacitance can be attributed to the synergistic effect of both faradaic and non-faradaic process of energy storage.

1. Introduction

As the demand for renewable energy sources for fulfilling the future energy needs of the world is urgently on the rise, the energy storage has been a bottleneck in the renewable energy market and there is a global search for technically viable energy storage devices. Although Lithium-ion batteries have been used as an excellent energy storage device it is unsuitable for catering the huge power needs of modern electronic devices and hybrid vehicles [1,2]. The development of novel materials with high energy density as batteries and power densities as supercapacitors is the present-day challenge among the scientific

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Recent developments in the adsorptive removal of heavy metal ions using metal-organic frameworks and graphene-based adsorbents

Pinnanath Neethu Das [a], Kavil Jithesh [b], Kovummal Govind Raj [a,*]

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ARTICLE INFO

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Adsorption
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ABSTRACT

Clean and potable water is a growing concern around the globe. Among the different water pollutants, heavy metal ions pose a serious health concern to all living beings. The quest for new adsorbents to remove heavy metal ions received a boost with the development in the field of metal-organic framework (MOF). The advancement in synthetic strategies and designing of MOF enabled the researchers to tune the adsorption characteristics and tailor the material specific to a heavy metal ion. Similar to MOF, graphene-based two-dimensional and three-dimensional materials are also promising due to the diverse functionalization possibilities and cost-effectiveness. There had been growing interest in applying MOF and graphene-based materials for the removal of heavy metal ions in the past decade. This review summarizes these developments in detail.

1. Introduction

The scarcity of clean water has been an ever-rising concern for humanity. The factors such as urbanization, population growth, industrial production, climate change, uncontrolled mining, etc., are the major contributions to the deterioration of water quality [1]. As we all know, the most common and highly dangerous water pollutants are heavy metals [2–4]. Based on the health importance, heavy metals are classified into four categories such as essential metals (Cu, Zn, Co, Cr, Mn, and Fe), non-essential metals (Ba, Al, Li, and Zr), less toxic metals (Sn and As) and highly toxic metals (Hg, Cd, and Pb) [5]. Due to the extreme health hazards of heavy metal pollution, the harmful effect of metal ions and their removal methods has been extensively studied [6–10].

The conventional water treatment techniques include coagulation-flocculation, solvent extraction, reverse osmosis, electrodialysis, ion flotation, ion exchange, and adsorption [11–17]. Among all these methods, adsorption is the most accepted and widely used method due to its simplicity and efficiency. The various adsorbents include activated carbon, chitosan, zeolites, and clays [18–21]. Among the various adsorbents, activated carbon is the most preferred adsorbent due to its low cost and availability [22,23]. However, the disordered structure of amorphous carbon restricts the fundamental studies and structural optimization for improved removal performance [24]. Therefore there is a decline in the acceptability of activated carbon in the large-scale application for water treatment.

With the recent growth of nanotechnology, a new class of adsorbents has emerged, which has much more efficiency and selectivity when compared to conventional adsorbents [25]. Such nano-adsorbents include carbon nanotubes [26–28], iron oxides [29,30], MOFs [31,32], graphene-based materials [33,34], manganese dioxide-based nanomaterials [35,36] etc. These nano-adsorbents are promising candidates in environmental remediation due to their high surface to volume ratio, surface modifiability, reversibility, biocompatibility, and selectivity. The surface modification of nano-adsorbents is known to enhance the selectivity of nano-adsorbents towards a particular pollutant [37].

MOFs are considered to be an excellent platform for removing toxic materials from water because of their fascinating structure and salient physical properties like tunable pore size, large pore volume, high specific surface area, and the possibility of case-specific tailoring of basic molecular architecture [38]. The structure of a MOF can be engineered by the careful choice of a metal ion and an organic linker. By grafting various functional groups such as those bearing different polarity, acidity, hydrophilicity, and by tuning the size of the organic linkers, respectively, the pore sizes and pore/surface properties of MOFs can be adjusted. Functionalization can be achieved by using organic linkers during the synthesis or by a post-synthetic modification route. Post-synthetic modification is an effective and practical tool for the modification of the structure and properties of MOFs. Functionalization

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SREE NARAYANA COLLEGE
KANNUR

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3.5.1

Number of functional MoUs/linkages with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years.

List and Copies of Documents indicating MoUs / linkage/ Collaborations Yearwise

2022-23

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

N.A.M COLLEGE KALLIKKANDY

(Aided and Affiliated to Kannur University)

VIDYAGIRI, P.O. KALLIKKANDY, KANNUR Dist, KERALA - 670 693

Ph: 0490 2463067, web: www.namcollege.ac.in, email: namcollege@yahoo.co.in

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MEMORANDUM OF UNDERSTANDING

between

DEPT. OF POLYMER CHEMISTRY, N A M COLLEGE,
KALLIKKANDY PO, THALASSERY, KANNUR DISTRICT, KERALA STATE, 670 693

&

POST GRADUATE AND RESEARCH DEPARTMENT OF CHEMISTRY,
SREE NARAYANA COLLEGE, KANNUR, KANNUR DISTRICT, KERALA STATE, 670 001

On

Collaborative Work in Research Methodology, Students Project Study and Continuous Internal Evaluation (CIE)

Purpose

The purpose of this MoU is to state the intentions of the two parties in undertaking collaborative work in research methodology, students project study and continuous internal evaluation (CIE)

Categories of Cooperative Activities

1. The objective of this MoU is to develop co-operation between two institutions.
2. Utilize the research facilities of both the institutions to conduct collaborative research works.
3. Obtaining of instrumental facilities including UV-Vis spectrometer, thin film applicators, magnetic stirrer, photo-degradation chamber etc. which are made available by both parties.
4. Project work in the development of synthesis methods of polymer thin films and composites for characterisation and mass transfer and photo-degradation applications
5. Conduct research methodology seminars, workshops, laboratory visit and faculty exchange.
6. Operate the service and skill of the academic staff of both the institutions in preparing internal examination question paper and valuing assignment and seminars.
7. Exchange of students and research scholars to attend programs, discussions, demonstrations and workshops conducted by both the institutions.

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Funding

Each Party will bear their own funds based on their requirements. And expenses of purchasing chemicals and travelling will be beard from the student's project fund and Dept. development fund.

Formal Agreement

The Parties' intentions expressed in this MoU will be the subject of a future definitive agreement, which will contain detailed provisions stating the Parties' rights and obligations including:

a. Comprehensive statement of each work
b. Exchange of materials and data
c. Intellectual property arrangements
d. Disclosure of confidential information
e. Roles and responsibility in administering and managing the project.

Publicity and Use of Names and Trademarks

Without prior written approval of an authorized representative of the other Party, nothing in this MoU authorizes a Party to use the name of the second Party or its employees in any advertisement, press release, or any other publicity.

General Terms

1. This MoU is effective from the date when both parties have signed it ("Effective Date").
2. This MoU shall remain in force for a period of FIVE YEARS from the Effective Date.
3. The MoU may be amended or extended by mutual consent in writing signed by authorized representatives of the Parties.
4. Each party is liable for its own acts and omissions under this MoU, which, for the prevention of doubt, does not include any liability based on the acts or omissions of a third party.
5. No export-controlled information shall be disclosed pursuant to this MoU.
6. This MoU may be executed in counterparts, which taken together will constitute one document.

Signed for and on behalf of

For **Dept. of Polymer Chemistry, N A M College, Kallikkandy,** by its authorized representative:

8/12/21

Name and Signature with Date

Dr. MUHAMMAD ISMAYIL K
Asst. Professor & HOD
Dept.of Polymer Chemistry
NAM College, Kallikkandy
Kannur, Kerala - 670 693

Dept. of Chemistry, S.N College, Kannur by its authorized representative:

Name and Signature with Date

8/12/21

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KANNUR

Copy to

8/12/21

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N.A.M.COLLEGE, KALLIKANDY

1. Principal N.A.M College, Kallikkandy

2. Principal S.N College, Kannur

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I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

KANNUR UNIVERSITY
(NAAC Accredited with B++ grade)
DEPARTMENT OF ENVIRONMENTAL STUDIES
Mangattuparamba Campus
Kannur University (PO); Mangattuparamba, Kannur, Kerala - 670567
Tel: 0497 2781043; E-mail : pperiyat@kannuruniv.ac.in

CERTIFICATE OF COLLABORATION

This is to certify that the Dr. Jithesh K, Assistant Professor, Department of Chemistry, Sree Narayana College Kannur is actively collaborating with Dr. Pradeepan Periyat, Associate Professor and Head, Department of Environmental Studies, Kannur University in various academic and research activities for the academic year 2021-2022.

1. Co-supervising post-graduate and research students
2. Knowledge sharing though faculty exchange
3. Undertaking research projects
4. Publication Research papers in International Journals

Dr. Pradeepan Periyat

Kannur

01-06-2022

SATHEESH CHERIYAPUTHALATH
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21.10.2024 16:00

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Article

Facile Synthesis of Polyindole/$Ni_{1-x}Zn_xFe_2O_4$ (x = 0, 0.5, 1) Nanocomposites and Their Enhanced Microwave Absorption and Shielding Properties

Anjitha Thadathil, Jithesh Kavil, Govind Raj Kovummal, Chamundi P. Jijil, and Pradeepan Periyat*

Cite This: *ACS Omega* 2022, 7, 11473−11490

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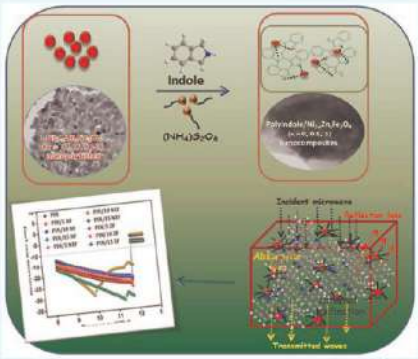
ABSTRACT: The present work reports the fabrication of polyindole (PIN)/$Ni_{1-x}Zn_xFe_2O_4$ (x = 0, 0.5, 1) nanocomposites as efficient electromagnetic wave absorbers by a facile in situ emulsion polymerization method for the first time. The samples were characterized through Fourier transform infrared spectroscopy, UV−vis spectroscopy, X-ray diffraction, thermogravimetric analysis, scanning electron microscopy, high-resolution transmission electron microscopy, and vibrating sample magnetometry. The resulting polyindole/$Ni_{1-x}Zn_xFe_2O_4$ (x = 0, 0.5, 1) nanocomposites offer better synergism among the $Ni_{1-x}Zn_xFe_2O_4$ nanoparticles and PIN matrix, which significantly improved impedance matching. The best impedance matching of $Ni_{1-x}Zn_xFe_2O_4$/polyindole (x = 0, 0.5, 1) nanocomposites was sought out, and the minimum reflection loss of the composites can reach up to −33 dB. The magnetic behavior, complex permittivity, permeability, and microwave absorption properties of polyindole/$Ni_{1-x}Zn_xFe_2O_4$ (x = 0, 0.5, 1) nanocomposites have also been studied. The microwave absorbing characteristics of these composites were investigated in the 8−12 GHz range (X band) and explained based on eddy current, natural and exchange resonance, and dielectric relaxation processes. These results provided a new idea to upgrade the performance of conventional microwave-absorbing materials based on polyindole in the future.



INTRODUCTION

The development of high-performance electromagnetic interference (EMI) shielding/microwave-absorbing materials has become a current focus in solving the problem of EMI pollution arising from the fast-growing telecommunication equipment and other electro-electronic device industries.[1,2] In the last decade, the charm of 2D nanomaterials, such as graphene,[3,4] g-C_3N_4,[5] MXenes,[6] WS_2,[7] and MoS_2,[8] has intrigued great deal of interest due to their microwave-absorbing properties originating from their broadband optical response, strong plasmon oscillation, gate-tunable conductivity, active variable THz band gaps, and enormous surface area-to-volume ratio. In addition, as a new class of Dirac materials with a small band gap, TI was also found to show saturable absorption at telecommunication wavelengths.[9] In general, it is noticed that individual magnetic and dielectric electromagnetic wave-absorbing materials show satisfactory performance due to the poor impedance matching.[10] Accordingly, noteworthy attempts have been made to build high-performance composite microwave-absorbing materials comprising both magnetic and dielectric components, which would offer better impedance matching and improved electromagnetic shielding performance through the effective complementarities and synergies between magnetic loss and dielectric loss.[11,12] Recently, researchers have explored the effect of nanoparticle-induced moderations in conducting polymers that possess the most effective colligative electronic, magnetic, and optical properties. Conducting polymer ferrite composites have drawn much attention as an EMI-shielding/absorbing material due to their high dielectric and magnetic losses,[13] corrosion resistance, low density, and ease of processing.[14] Among the conducting polymers, polyindole (PIN) and its derivatives have not yet been explored as microwave-absorbing/shielding materials. Despite several advantages such as air-stable electrical conductance,[15] slow hydrolytic degradation,[16] high redox activity,[17] high cycling, and thermal stability as compared to polyaniline (PANI) and polypyrrole (PPY), PIN still suffers from lesser conductivity than PANI and PPY.[18] However, electrical conductivity in the range from 10^{-3} to 10^{-1} S cm^{-1} is shown by PIN in its doped state.[19,20] When organic dopants with surfactant functionalities such as sodium dodecyl sulfate (SDS) and sodium dodecylbenzenesulfonate (SDBS) are employed, they play a dual role as dopants and as a

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List and Copies of Documents indicating MoUs / linkage/ Collaborations Yearwise

2022-23

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Memorandum of Understanding between

Department of Botany, Nehru Arts and Science College Kanhangad,

And

Department of Botany, Sree Narayana College Kannur

The Memorandum of Understanding is made on 15th June 2022 between Department of Botany, Nehru Arts and Science College Kanhangad and Department of Botany, Sree Narayana College Kannur. The general objective of this agreement is to establish an academic collaboration between the Department of Botany, Nehru Arts and Science College Kanhangad – 671314 and the Department of Botany, Sree Narayana College Kannur – 670007. This academic collaboration is to stimulate and facilitate the development of collaborative and mutually beneficial programs which will serve to enhance the intellectual life and cultural developments in students.

Subject to mutual consent, the areas of collaboration will include any programme offered at either institution as thought desirable and feasible on either side and that both sides will contribute to the fostering and development of the collaborative relationship between the Botany departments of two colleges. Collaboration shall be carried out through the activities such as:

1) Faculty exchange programmes, student exchange and seminars can be conducted by both the institutions in collaboration.

2) Exchange of academic materials and other information.

3) Sharing of resources for inculcating a research culture for degree students.

This agreement will take effect from the date of its signing and will be valid only for three years.

The designated liaison officers for this Memorandum of Understanding are

1. Mr./Smt. Dr. Subrahmanya Prasad K., Assistant Professor, Dept. of Botany, Nehru Arts and Science College Kanhangad.

2. Mr./Smt. Dr. Aparna P., Assistant Professor, Dept. of Botany, Sree Narayana College Kannur.

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

In witness whereof the said first party and the second party have put their signatures, here under the day, month and year first above written.

Signature of the first party

Dr. PRAJITH P.K
M.Sc, Ph.D
Assistant Professor, Dept. of Botany
Nehru Arts & Science College
Padnekkad P.O, Kanhangad-671314

NEHRU ARTS & SCIENCE COLLEGE
P.O. Padnekkad
Kasaragod Dt.
KANHANGAD

Signature of the second party

Dr. K.P. PRASANTH M.Sc, B.Ed, PGDSD, Ph.D
Assistant Professor of Botany & Head
Department of Botany
Sree Narayana College
Thottada P.O., Kannur, Kerala - 670007

In the presence of the following witnesses:

1. Dr. Agrafious Thomas

2. Dr. Jeethma. O.V, S.N. College Kannur

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

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Memorandum of Understanding between

Department of Botany, Nehru Arts and Science College Kanhangad,

And

Department of Botany, Sree Narayana College Kannur

The Memorandum of Understanding is made on 27th March 2023 between Department of Botany, Nehru Arts and Science College Kanhangad and Department of Botany, Sree Narayana College Kannur. The general objective of this agreement is to establish an academic collaboration between the Department of Botany, Nehru Arts and Science College Kanhangad – 671314 and the Department of Botany, Sree Narayana College Kannur – 670007. This academic collaboration is to stimulate and facilitate the development of collaborative and mutually beneficial programs which will serve to enhance the intellectual life and cultural developments in students.

27/3/23

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27/3/23

PRINCIPAL
NEHRU ARTS & SCIENCE COLLEGE
KANHANGAD

DISTRICT TREASURY KANNUR
24 MAR 2023

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Subject to mutual consent, the areas of collaboration will include any programme offered at either institution as thought desirable and feasible on either side and that both sides will contribute to the fostering and development of the collaborative relationship between the Botany departments of two colleges. Collaboration shall be carried out through the activities such as:

1) Faculty exchange programmes, student exchange and seminars can be conducted by both the institutions in collaboration.

2) Exchange of academic materials and other information.

3) Sharing of resources for inculcating a research culture for degree students.

This agreement will take effect from the date of its signing and will be valid only for three years.

The designated liaison officers for this Memorandum of Understanding are

1. Mr./Smt. Dr. Subrahmanya Prasad. K, Assistant Professor, Dept. of Botany, Nehru Arts and Science College Kanhangad.

2. Mr./Smt. Dr. K. P. Prasanth....., Assistant Professor, Dept. of Botany, Sree Narayana College Kannur.

In witness whereof the said first party and the second party have put their signatures, here under the day, month and year first above written.

27/3/23

Signature of the first party

PRINCIPAL
NEHRU ARTS & SCIENCE COLLEGE
KANHANGAD

NEHRU ARTS & SCIENCE COLLEGE * P.O.Padnekad Kasaragod Dt. * KANHANGAD

Signature of the second party

27/3/23

PRINCIPAL
SREE NARAYANA COLLEGE
KANNUR

In the presence of the following witnesses

1. Dr. Agretious Thomas
   NAS College Kanhangad

2. Dr. Aparna P
   SN College, Kannur.

കേരളം केरल KERALA DU 027559

MEMORANDUM OF UNDERSTANDING (MoU)

FOR

ACADEMIC COOPERATION

This Memorandum of Understanding (MoU) agreement is executed on this 1st day of December 2022

BETWEEN

PG Department of Biotechnology, Sir Syed Institute for Technical Studies, Taliparamba, Kannur on the first part (here in after called as first party)

AND

Department of Microbiology, Sree Narayana College, Kannur on the second part (here in after called as second party)

WHERE AS the first party who is the department of Biotechnology in Sir Syed Institute of Technical Studies, Taliparamba, Kannur, a leading self-finance institution run by CDMEA has expressed willingness to the second party who is the Dept. of Microbiology of Sree Narayana College, Kannur, a well reputed aided college run by Sree Narayana Trust, Kollam.

Sir Syed Institute for Technical Studies, Taliparamba

10156 Taliparamba 24-8-2022 100

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

SUB TREASURY TALIPARAMBA 23

To establish relation between the two educational institutions, to enhance cooperation between the two departments for academic activities and to cooperate with each other in the process of inculcating higher level knowledge and sharing resources and experiences for the benefit of students and research scholars of both the institutions.

AND WHEREAS the second party has accepted the proposal believing that the academic tie up between the institutions would foster and support the academic projects and resources from both the colleges for joint co-development of innovative services. This agreement for the academic tie up between the institutions for a period of three years from the date of this agreement upon the terms and conditions here in after mentioned.

NOW THE Memorandum of understanding witnesses as follows:

1. The purpose of this MoU is to develop academic cooperation and to promote mutual understanding between the two educational institutions.
2. Both institutions agree and shall endeavor to promote collaborative activities in academic and research areas of mutual interest on a basis of equality and reciprocity.
3. Utilize the service and expertise of the teachers of the respective colleges for mutual benefit.
4. It is agreed to create a structured forum for peer-to-peer interaction, experience sharing, and exchange of views among the faculty and students for better networking and synergy.
5. Exchange of students-graduate and undergraduate to attend seminars, exhibitions and workshops conducted by the two institutions.
6. The terms of cooperation for each specific activity implemented under the MoU shall be mutually discussed and agreed upon by both the party.
7. This MoU shall remain in force for a period of three years from the date of this agreement and shall be renewed for a further period on mutual consent of the party.
8. Each institution shall designate a liaison officer to develop and coordinate the specific activities agreed upon.

Signature of the first party

PRINCIPAL
SIR SYED INSTITUTE FOR
TECHNICAL STUDIES
TALIPARAMBA-670 142

Signature of the second party

PRINCIPAL
SREE NARAYANA COLLEGE
KANNUR

SIR SYED INSTITUTE FOR TECHNICAL STUDIES * TALIPARAMBA *

SREE NARAYANA COLLEGE * KANNUR *

In the presence of the following witnesses:

1. Dr. Siraj. M.V.P, Head of dept. of Biotechnology
   Sir Syed Institute for Technical Studies, Taliparamba, Kannur.

2. Mr. Ramesan. C.K.V, Asst. Professor in Microbiology,
   Sree Narayana College, Kannur

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

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SREE NARAYANA COLLEGE, KANNUR
(Affiliated to Kannur University)
Thottada (P.O), Kannur -7

MEMORANDUM OF UNDERSTANDING

Date :

The MEMORANDUM OF UNDERSTANDING
is entered into between the
SREE NARAYANA COLLEGE, KANNUR, KERALA
and

Probhodha Trust, 48/1680,Ponnurunni East,Kochi,Ernakulam, (Reg.No.15/IV/2021 dt.27-02-2021) A Public Charitable Institution

provide as follows:

The Secretary of Probodha Trust, Ponnurunni East, Kochi, Ernakulam, a public charitable institution engaged in social, cultural and academic activities has proposed an intention of furthering cooperation in academic , social research and charity activities .They have affirmed their intention to promote such academic exchange which will be of mutual benefit for the concerned institutions. Academic exchanges include the following matters too.

For Probodha Trust

PRINCIPAL
SREE NARAYANA COLLEGE
KANNUR

DISTRICT TREASURY
20 JUN 2022
KANNUR

SREE NARAYANA COLLEGE KANNUR

ASSISTANT PROFESSOR & HEAD
DEPARTMENT OF MALAYALAM
SREE NARAYANA COLLEGE
KANNUR - 670 007

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

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(2) Exchange of faculty and staff for the purposes of research and extension;

(3) Reciprocal assistance for visiting scholars and visit to historically important places in India.

(4) Coordination of such activities as joint research and transfer of concepts and ideas.

(5) Exchange of documentation and research materials in the fields of mutual interests.

(6) Fostering social consciousness among the students.

Details of the implementation of any particular exchange resulting from this Memorandum of Understanding shall be negotiated between the two parties as such specific case may arise, and is subject to availability of sufficient funds.

This Memorandum of Understanding to promote academic exchange and cooperation will be valid for five years and is subject to revision, renewal or cancellation by mutual consent and shall be implemented in the form of Memorandum of Agreement which explain in details the rights and obligations of each party.

This Memorandum of Understanding becomes effective upon completion of signature.

IN WITNESS, therefore, the parties have hereunto set their respective signatures on this date.

Prabhodha Trust

President Secretary

PRINCIPAL SREE NARAYANA COLLEGE KANNUR

DISTRICT TREASURY

For Probhodha Trust

President Secretary Treasurer

Dr. Vinod Kumar Kalloickal
President, Probhodha Trust, Kochi.

PRINCIPAL
SREE NARAYANA COLLEGE
KANNUR

Dr. K. Ajayakumar,
Principal
Sree Narayana College,
Kannur, Kerala

Sri Naveen Kumar D .D.
Secretary
Probhodha Trust
Ponniruni East,Kochi,Ernakulam

For Probhodha Trust

President Secretary Treasurer

SREE NARAYANA COLLEGE KANNUR

Witnesses

1. Adv. Dr. RadhaKrishnan Nair
   Radheyam, 69/3075,SRM Road,
   Cochin--18

2. Dr. M. P. Shanoj
   Head, Department of Malayalam
   Sree Narayana College, Kannur, Kerala

Dr. M. P. SHANOJ
ASST. PROFESSOR & HEAD
DEPARTMENT OF MALAYALAM
SREE NARAYANA COLLEGE
KANNUR - 670 007

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

SREE NARAYANA COLLEGE THOTTADA, KANNUR
POST GRADUATE AND RESEARCH DEPARTMENT OF COMMERCE

MoU REPORT

Memorandum of Understanding entered on the 1st Day of DECEMBER 2022 between THE SN COLLEGE KANNUR, KANNUR DIST KERALA STATE represented by its HOD-COMMERCE DR.AMUTHA. R and THE TAX STUDY VOCATIONAL TRAINING CENTRE, 2ND FLOOR, 'CPI BUILDING', JUDGES AVENUE, LISIE JUNCTION, KALOOR, ERNAKULAM – 682 017 represented by its Managing Partner, Mr. ROOPESH.K, Madappally House. Kannur.

THE TAX STUDY VOCATIONAL TRAINING CENTRE is an Authorized Training Partner of National Council of Vocational and Research Training, New Delhi, popularly known as NCVRT, an Autonomous Body incorporated under the legislation of Ministry of Corporate Affairs, Government of India, New Delhi to conduct Training in Diploma in Practical Accounting & Tax Practice (DPATP), and Tally with GST Courses.

The Course duration will be a minimum of 150 hrs. for each student, spread out through the academic year 2022 and 2023. The Department of Commerce, The SN College, KANNUR is incharge of the Programme. Mr.DIRASH.R .S,Assistant Professor Department of Commerce, is the Co-ordinator for conducting this course.

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

കേരളം केरल KERALA

DU 232210

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding entered on the 1st Day of DECEMBER 2022 between THE SN COLLEGE KANNUR, KANNUR DIST KERALA STATE represented by its HOD-COMMERCE DR.AMUTHA. R (hereinafter referred to as the FIRST PARTY) which term shall mean and include her successors, representatives etc., and THE TAX STUDY VOCATIONAL TRAINING CENTRE, 2ND FLOOR, 'CPI BUILDING', JUDGES AVENUE, LISIE JUNCTION, KALOOR, ERNAKULAM – 682 017 represented by its Managing Partner, Mr. ROOPESH.K, Madappally House. Kannur.(hereinafter referred to as the SECOND PARTY).

Whereas the Second Party is the Authorized Training Partner of National Council of Vocational and Research Training, New Delhi, popularly kown as NCVRT, an Autonomous Body incorporated under the legislation of Ministry of Corporate Affairs, Government of India, New Delhi to conduct Training in Diploma in Practical Accounting & Tax Practice (DPATP), and Tally with GST Courses.

Dr. Amutha. R
Assistant Professor & Head
P. G. Department of Commerce
Sree Narayana College, Kannur
Kannur - 670 007, Kerala

FOR TAX STUDY CENTRE
DIRECTOR

FIRST PARTY

DR.AMUTHA.R

HOD-COMMERCE

SN COLLEGE,KANNUR

SREE NARAYANA COLLEGE
DEPARTMENT OF COMMERCE
KANNUR-670007

TAX STUDY CENTRE
KOTTARAKARA

SECOND PARTY

Mr.ROOPESH.K

ROOPESH. K. VENGARA
MADAPALLY HOUSE
P. O. VENGARA
KANNUR-670 305, KERALA ST

നമ്പ്ര് 27822 .... അംശത്തിൽ
17.11.22

SUB TREASURY
07 NOV 2022
PAZHAYANGADI

പഴയങ്ങാടി സ.റ.ട്ര.ആ. വേണ്ടർ. എ. മെമ്മൻ

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

കേരളം केरल KERALA

DU 232211

The First Party desires to have the Second party's Diploma in Practical Accounting and Tax Practice Course implemented in their College in Kannur.

The Second Party accepts the proposal and both the parties agree to set forth with the following terms and conditions:

Now the Memorandum of Understanding witness:-

1. The Second party will arrange to provide Certificate Course in Diploma in Practical Accounting and Tax Practice .

2. The Course duration will be a minimum of 150 hrs. for each student, spread out through the academic year 2022 and 2023 depending on the individual capabilities for imparting training as mentioned in paragraph 1.

3. To Provide students an option to attempt for NCVRT's examination by paying an additional sum of Rs. 2,000/- [Rupees Two Thousand only] as Registration and Examination fees. The above mentioned examination is to be conducted by National Council for Vocational Research & Training, (popularly known as NCVRT) New Delhi, and provide the Certificate and Mark list thereof.

FIRST PARTY

DR.AMUTHA.R

HOD-COMMERCE

SN COLLEGE,KANNUR

Assistant Professor & Head
P. G. Department of Commerce
Sree Narayana College, Kannur
Kannur - 670 007, Kerala

SREE NARAYANA COLLEGE
DEPARTMENT OF COMMERCE

SECOND PARTY

Mr.ROOPESH.K

ROOPESH. K. VENGAD HOUSE
P. O. VENGARA
KANNUR-670 306, KERALA ST

നമ്പ്ര് 27822 ... തീയതി
17.11.22

ഓഫീസ് ... 100 ...

പഴയങ്ങാടി

SUB TREASURY
07 NOV 2022
PAZHAYANGADI

केरळം केरल KERALA DP 233469

MEMORANDUM OF UNDERSTANDING

Between

POST GRADUATE DEPARTMENT OF ECONOMICS, S.N. COLLEGE, KANNUR,

DEPARTMENT OF ECONOMICS, PAYYANUR COLLEGE, PAYYANUR

&

POST GRADUATE DEPARTMENT OF ECONOMICS, K.M.M. GOVERNMENT WOMEN'S COLLEGE, KANNUR

on

Collaborative Work in Academic Activities under the Banner of ***Researching in Economics: New Frontiers*** *hereafter known as* ***Ecohort***

Purpose

The purpose of this MOU is to jointly organise academic activities like conferences, workshops, lectures, seminars and other events that would promote academic culture in the field of economics in institutions that have signed this MOU.

Objectives

1. To develop academic co-operation among the above-mentioned three institutions affiliated to Kannur University.
2. To utilize the resources of the three institutions to conduct collaborative academic activities under the title Researching in Economics: New Frontiers
3. To create academic interests among the students of economics by giving them more exposure through organising various activities.
4. Students can avail the academic support of teachers and students from all these institutions depending on their field of expertise.

Dr PUNNAKAL RAMANA MUKUNDAN
Assistant Professor
Department of Economics
Sree Narayana College, Kannur-7

Assistant Professor Department of Economics S.N.College Thottada

BINU MATHEWS
Associate Professor
Dept. of Economics
Payyanur College, Payyanur
Edat P.O.

DR. BABY JOSEPH MATHEW
ASSOCIATE PROFESSOR
P.G. DEPARTMENT OF ECONOMICS
K.M.M. GOVT. WOMEN'S COLLEGE, KANNUR
PALLIKUNNU (P.O.), KANNUR - 670 004
(Department of Collegiate Education, Kerala)

21.12.2023

भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

रु. 100

ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

കേരളം केरल KERALA

DP 884169

Memorandum of Understanding between
Department of Physics, S.E.S College, Sreekandapuram,
And
Department of Physics, S N College, Kannur

The Memorandum of Understanding is made on 10th October 2022 between Department of Physics, S.E.S College, Sreekandapuram and Department of Physics, S N College, Kannur. The general objective of this agreement is to establish an academic collaboration between the Department of Physics, S.E.S College, Sreekandapuram - 670631 and Department of Physics, S N College, Kannur 670007. This academic collaboration is to stimulate and facilitate the development of collaborative and mutually beneficial programs which will serve to enhance the intellectual life and cultural developments in students.

Subject to mutual consent, the areas of collaboration will include any programme offered at either institution as thought desirable and feasible on either side and that both sides will contribute to the fostering and development of the collaborative relationship between the Physics departments of two colleges. Collaboration shall be carried out through the activities such as:

1) To organize a certificate course on "Renewable Energy" for final year BSc Physics students of both colleges.
2) Student exchange and seminars can be conducted by both the institutions in collaboration.
3) Exchange of academic materials and other information
4) Team taught courses, including online courses.

Continued Page 2

നമ്പർ 7296 തീയതി 26-9-2022
പ്രിൻസിപ്പൽ SES കോളേജ്

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

കേരളം केरल KERALA

DP 884170

5) Sharing of resources for inculcating a research culture for degree students.

This agreement will take effect from the date of its signing and will be valid only for one year.

The designated liaison officers for this Memorandum of Understanding are

1. Mr./Smt. ………………...........……….., Assistant Professor, Dept. of Physics, S E S College, Sreekandapuram.

2. Mr./Smt. SRESHMA RAJAN……………..........., Assistant Professor, Dept. of Physics, S N College, Kannur.

IN WITNESS WHEREOF the said first party and the second party have put their respective signatures, here under the day, month and year first above written.

Signature of the first party

Signature of the second party

In the presence of the following witnesses

1.

2.

നമ്പർ 7277 അംശം ശ്രീകണ്ഠപുരം
പേര് പ്രിൻസിപ്പൽ SES കോളേജ്
തീയതി 26-7-2022 വില 100-രൂ
ശ്രീകണ്ഠാപുരം സ.റ. ആഫീ വെണ്ടർ
വി. ജോസഫ്

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kann
21.10.2024 16:00

भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

रु. 100

ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

കേരളം केरल KERALA

LK 996280

MEMORANDUM OF UNDERSTANDING (MOU)

BETWEEN

MATHLAB RESEARCH Pvt. Ltd.

AND

DEPARTMENT OF MATHEMATICS,

SREE NARAYANA COLLEGE, KANNUR

നമ്പർ 108773 പേര് ....

അംശം ....

തീയ്യതി 6-1-23 ക 100

കണ്ണൂർ താലൂക്ക് ആഫീസ് ആക്ടിങ്

വെണ്ടർ കെ. പി. ജഗദീഷ്

DISTRICT TREASURY
JAN 2023
KANNUR

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

This Memorandum of Understanding (MOU) is a service agreement, to provide Add-on courses in online mode for the ongoing degree students for acquiring necessary soft-skills, entered between **MATHLAB RESEARCH Pvt. Ltd.**(hereafter referred to as **MathLab Research**),having its Registered Office at I floor, Anjikkath Tower, Koonamthai (P O), Edappally, Cochin-682 024,and the **DEPARTMENT OF MATHEMATICS, SREE NARAYANA COLLEGE, KANNUR,** (hereafter referred to as **Department of Mathematics**).

To this end the parties operating under this MOU agree as follows: -

A. **MathLab Research** is a company, doing research, product development and provides industrial exposures to mathematics aspirants through industrial projects, trainings and Add-on courses.
B. **Department of Mathematics,** Department of Mathematics has been established in 1961. Offers UG Programme in Mathematics and Post Graduate program in Mathematics. Statistics and Physics are the complimentary courses for B. Sc Mathematics.

The parties intend to enter into an MOU to conduct add on courses for the students of DEPARTMENT OF MATHEMATICS, SREE NARAYANA COLLEGE, KANNURwith MathLab Research as their training partner.

C. **TRAINING PROGRAM: MathLab Research** will provide training content, train students and conduct practice tests to enhance their soft skills needed for industry. The following add-on courses will be provided:

The details of the training program are included in **Annexure 1.**

D. **THE STUDENTS:** B.Sc Mathematics Students of **Department of Mathematics** from academic year 2022-23 to 2024-25 will be beneficiaries of the course.

E. **RESPONSIBILITIES–MathLab Research: -**
MathLab Research will provide the content of the training of Add-on courses through MathLab Research's official website and that includes recorded videos of theory and problems, pdf materials, tutorials and tests. Proper documentation of all add-on courses including schedule of classes, detailed syllabi of the Add-On courses, certificates of Add-On courses, attendance log, results of tests and internal/final evaluation marks, will be submitted to **Department of Mathematics.**

DIVYA P.M.
Assistant Professor
Department of Mathematics
SN College, Kannur

MathLab Research Pvt. Ltd. Cochin-24

For MathLab Research Pvt. Ltd.

SATHEESH CHERIYAKUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Authorized Signatory

F. **RESPONSIBILITIES – Department of Mathematics,**

- **Department of Mathematics** on its part will be responsible to promote the training program among students and get the students registered for the program.
- **Department of Mathematics** will assign one of its faculties as the Course Coordinator for the smooth conducting of the training program.
- **Department of Mathematics** shall provide the lab facilities for the practical sessions of Add-on courses.

G. **FEE:** The fee for this training program is attached in **Annexure-2**

H. **PAYMENT:**The fee is to be paid by **Department of Mathematics** directly to **MathLab Research** with intimation to the authorities concerned of **Department of Mathematics**before the commencement of the training. **MathLab Research** will formally produce an invoice for the same to initiate the payment.

I. **REGISTRATION FOR THE PROGRAM**: The **Department of Mathematics**Course Coordinator shall work closely with the **MathLab Research** officials to complete all work related to the registration of the students for the program including the payment of the fees with proper documentation.

J. **THE SCHEDULE:**The schedule for the training sessions, practice tests and practical sessions, etc., and their timings shall be mutually decided by **MathLab Research** and **Department of Mathematics** taking into consideration of the regular class timings, university examinations etc. of the registered batch of students.

K. **CONDUCTING OF THE CLASSES:** The online classes for the modules shall be conducted through **MathLab Research**'s Website. The students should have the option to watch the video classes multiple times at their own convenience or **Department of Mathematics** shall provide the required facility (online/practical) for the registered students.

L. **EXCLUSIVE SESSIONS:** The sessions of each batch of **Department of Mathematics** are exclusively for the registered batch. Non-registered students will not have the access to the online course. Each course is designed for one class of students. Students from various departments or different year shall not be permitted to be grouped.

M. **TERM:** Terms of this MoU shall be for a period of three years starting from16/01/2023.The MoU can be renewed for a further period on terms agreed by the parties at that time. The courses will no longer be available after the above-mentioned duration.

DIVYA P.M.
Assistant Professor
Department of Mathematics
SN College, Kannur

For MathLab Research Pvt. Ltd.

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Authorized Signatory

N. **TERMINATION:** This MoU may be terminated by either party by notice in writing from the party not at fault if the other party is in breach of this MoU and fails to remedy the breach within thirty (30) days from receipt of notice in writing from the first party specifying the breach.

O. **CONFIDENTIALITY OF INFORMATION:** The parties herewith undertake to treat confidentially all information that they obtain directly or indirectly from each other within the framework of the student mobilization and training engagement. Confidential treatment means that the information obtained may not be made available to a third party and that the information may not be used for the parties' economic purposes or for the purposes of a third party. The parties undertake to use the information obtained solely for the purpose stipulated in this MoU. Any use going beyond that purpose or the conveying of information to a third party requires the written consent of both parties.

P. **FORCE MAJEURE:** Non-performance of either party (except for payment obligations) shall be excused to the extent that performance is rendered impossible by pandemics, strike, fire, flood, war, terrorism, act of God, government acts or orders or restrictions, failure of suppliers, or any other reason where failure to perform is beyond the control and not caused by the negligence of the non-performing party.

Q. **NON-COMPETE and NON- POACH:** **MathLab Research**and **Department of Mathematics** and its employees should not propose any potential project directly with the client(s)/ students for whom work is undertaken as part of this MoU without the formal and written consent of the other party.

R. **LANGUAGE:** The parties hereto are satisfied that this MoU and all related documents be drawn for training purposes or any other purposes in the English language.

S. **ALTERATION:** Alterations and supplements to this MoU must be made in writing to hold validity.
Neither of the parties shall do any act which is unethical, immoral or against any prevailing or future Law of India.

T. In the event of any dispute, the Courts in Ernakulam shall have jurisdiction

DEPARTMENT OF MATHEMATICS
KANNUR 670 007
S. N. COLLEGE

DIVYA P.M.
Assistant Professor
Department of Mathematics
SN College, Kannur

MathLab Research Pvt. Ltd.
Cochin-24

For MathLab Research Pvt. Ltd.

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Authorized Signatory

U. **DECLARATION:** IN WITNESS WHEREOF, THE UNDERSIGNED PARTIES, BY THEIR DULY AUTHORIZED REPRESENTATIVES BELOW, HAVE EXECUTED AND ENTERED INTO THIS MOU AS EFFECTIVE OF THE DATE OF SIGNATURE.

Department of Mathematics		MathLab ResearchCochin	
SIGNATURE		**SIGNATURE**	
NAME	DIVYA.PM	**NAME**	Riyasudheen TK
TITLE	Assistant Professor and Head.	**TITLE**	CEO, Mathlab Research Pvt. Ltd.
DATE	16/01/2023	**DATE**	21/01/2023

DEPARTMENT OF MATHEMATICS * S. N. COLLEGE * KANNUR 670 007 Seal

DIVYA P.M.
Assistant Professor
Department of Mathematics
SN College, Kannur

MathLab Research Pvt. Ltd. Cochin-24

Witness 1 Shyma.M.K, Assistant Professor in mathematics SN College Kannur

Witness 2

ARAVIND KRISHNAN.R
OPERATIONS MANAGER
MATHLAB RESEARCH PVT. LTD.

SREE NARAYANA COLLEGE * KANNUR

Dr. K. Ajaykumar
PRINCIPAL
SREE NARAYANA COLLEGE
KANNUR

SATHEESH CHERIYAPUTHALATH
I vouch for the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Annexure 1 – Add-On Courses Training Details

No.	Topics	Details of Course
1	Basics of Microsoft Excel	• Course Duration- minimum 30hrs per Semester • Recorded Video Sessions with Illustrations • Materials • Questions to be practiced in Labs • Internal and External Evaluation
2	Formulae and Functions in Microsoft Excel	
3	Basic Statistics in Microsoft Excel	
4	Advanced Statistics in Microsoft Excel	
5	Basics of GeoGebra	
6	Advanced Mathematics in GeoGebra	
7	Mathematical typesetting Using LATEX	
8	Programming with Python*	
9	Programming with R*	
10	Mathematics for Machine Learning*	
11	Fundamentals of Data Science*	

*Courses 8-11 will be available from January, 2023.

DEPT. OF MATHEMATICS KANNUR S.N. COLLEGE

DIVYA P.M.
Assistant Professor
Department of Mathematics
SN College, Kannur

For MathLab Research Pvt. Ltd.

MathLab Research Pvt. Ltd. 6 Cochin-24

Authorized Signatory

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Annexure 2 – Fees Structure

COURSE	DETAILS	FEE STRUCTURE
Add-On/Certificate Courses	BSc Mathematics Students of Department of Mathematics from academic year 2022-23 to 2024-25	₹ 5,000/- per course

DEPARTMENT OF MATHEMATICS
KANNUR 670 007
S. N. COLLEGE

DIVYA P.M.
Assistant Professor
Department of Mathematics
SN College, Kannur

For MathLab Research Pvt. Ltd.

MathLab Research Pvt. Ltd.
Cochin-24

Authorized Signatory

SESSION 13 23rd February 2023, 2.00 pm

Department of History

Resource : **Dr. Malavika Binny**
Assistant Professor and HOD, Department of History
Kannur University, Mangattuparamba Campus.

Topic : *Towards a Broader Understanding of Gender: Praxis, Theory and Play*

Venue : Seminar Hall

SESSION 14 24th February 2023, 10.00 am

Department of Management Studies

Resource : **Dr. Rahul Ramesh**
Assistant Professor, PG Department of Commerce,
Sree Sankara College, Kalady.

Topic : *Green Marketing - The Next Generation Marketing*

Venue : Seminar Hall

SESSION 15 24th February 2023, 2.00 pm

Department of Physics

Resource : **Dr. Suresh T.P.**
Assistant Professor, Department of Physics,
Govt Brennen College Thalassery.

Topic : *Quantum Mysteries*

Venue : Seminar Hall

SESSION 16 24th February 2023, 2.00 pm

Department of English

Resource : **Dr. Raghavan Vellikkeel**
Associate Professor , Department of Comparative
Literature, Central University of Kerala, Kasaragod

Topic : *Nonfiction Films*

Venue : Library Hall

SESSION 17 27th February 2023, 10.00 am

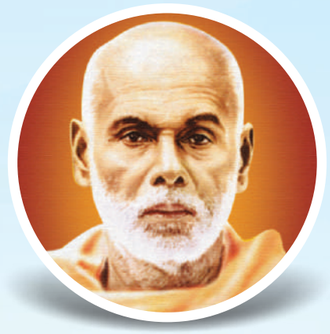
Department of Statistics

Resource : **Dr. R.K. Sunilkumar**
Assistant Professor and IT Director,
Department of Information Technology,
Kannur University

Topic : *Integral Transforms and Applications*

Venue : Seminar Hall

Valedictory Session
27th February 2023, 1.30 PM



Our Guide and Philosopher

Organizing Committee

Dr. K. Ajayakumar
Principal

Dr. K.P. Prasanth
IQAC Co-ordinator

Dr. M.P. Shanoj
PTA Secretary

Dr. Rajeev M.
Co-ordinator, Focus 2023

Dr. Ayana N.
Co-ordinator, FOCUS 2023

Sree Narayana College, Kannur
Kerala - 670 007

e-mail : sncollegekannur@gmail.com
Website: www.sncollegekannur.ac.in
Phones: 0497-2731085, 0497-2731400

Sree Narayana College, Kannur

NAAC Re-accredited with A Grade. CGPA: 3.04

FOCUS 2023

Multi disciplinary Seminar Series

Organized by
IQAC AND PTA OF SREE NARAYANA COLLEGE
KANNUR

In Academic Collaboration with
KERALA STATE HIGHER EDUCATION COUNCIL

15 - 27 February 2023

Inauguration by
Sri. A.V. Ajayakumar
Secretary, Kerala Folklore Academy
15th February 2023, 10.00 am

FOCUS 2023

Multi disciplinary Seminar Series

Sir/Madam

Sree Narayana College, Kannur is one of the biggest institutions of higher education in Kannur district. The college was founded in the name of his Holiness Sree Narayana Guru, the greatest saint and social reformer. The founder manager, Late R. Sankar made pioneering efforts to start a group of institutions named after Sree Narayana Guru with the intention of imparting quality education to students without any discrimination on the basis of class, caste or gender. The college was formally inaugurated on 6th July 1960.

From its status as a junior college, it has now grown in to a full fledged post graduate college with affiliated research centres in its post graduate departments of Zoology, Chemistry and Commerce and in UG department of Botany . The college offers 12 UG Programs and seven PG programmes and is reaccredited with NAAC "A" Grade in the second cycle.

The college concentrates on various academic and non-academic programmes to realize the potential of the students by traversing creative spaces to provide academic liberty so as to involve in critical enquiry for exchange of ideas without any fear, favour or hesitation. FOCUS seminar series is a regular annual academic programme of our college since 2010 which includes academic discourses of various prestigious departments of the college which has been strengthening the quality of the students to reach academic excellence.

FOCUS 2023 is organized by Parent Teacher Association and Internal Quality Assurance Cell in academic collaboration with Kerala State Higher Education Council. There will be 17 presentations of academic scholars from different universities and Institutions with an intention to accelerate the interest of the students in the contemporary realms of learning.

With immense pleasure we welcome you all to FOCUS 2023 seminar series scheduled from 15th to 27th February 2023. We expect your wholehearted support for this programme.

Thank you
With Regards
Dr. K. Ajayakumar (Principal)

Inauguration by
on 15th February 2023, 10.00 am

Sri. A.V. Ajayakumar
Secretary, Kerala Folklore Academy
Venue: **Seminar Hall**

TECHNICAL SESSIONS

SESSION 1 15th February 2023, 11.00 am

Department of Botany
Resource : **Dr. K.N. Ajoy Kumar**
Course Course Co - ordinator department of Botany, Kannur University - Mananthavady Campus
Topic : *Gene to Genome*
Venue : Seminar Hall

SESSION 2 16th February 2023, 9.30 am

Department of Mathematics
Resource : **Dr. Easwaran Nambudiri T.C.**
Head of the Department of Mathematics (Retired), Government Brennen College, Thalassery
Topic : *Infinite series and the Medieval Kerala Mathematics*
Venue : Seminar Hall

SESSION 3 17th February 2023, 10 am

Department of Hindi
Resource : **Dr. Remish N.**
Assistant Professor, Malabar College of Advanced Studies, Vengara, Malappuram
Topic : *Samakaleen Kavita mein Rajneethi*
Venue : Seminar Hall

SESSION 4 17th February 2023, 10 am

General Library
Resource : **Mr. Manoj Kumar P.**
Librarian (UGC), Nehru Arts & Science College Kanhangad.
Topic : *Online Learning Trends in the Dynamic Environment*
Venue : Computer Lab

SESSION 5 17th February 2023, 1.30 pm

Department of Political Science
Resource : **Dr. Sudheesh K.M.**
Assistant Professor, Department of Political Science Payyannur College, Payyannur.
Topic : *India's Living Constitution*
Venue : Seminar Hall

SESSION 6 20th February 2023, 10 am

Department of Zoology
Resource : **Dr. Dipu Sukumaran**
Scientist and Head CWRDM, Neyyattinkara, Thiruvananthapuram
Topic : *It's our turn for Wetland Restoration*
Venue : Seminar Hall

SESSION 7 20th February 2023, 1.30 pm

Department of Chemistry
Resource : **Dr. Abraham Joseph**
Senior Professor, Department of Chemistry, University of Calicut
Topic : *Nature Dynamics and Beyond...*
Venue : Seminar Hall

SESSION 8 21st February 2023, 10.00 am

Department of Microbiology
Resource : **Dr. Jeyabalan Sangeetha**
Assistant Professor, Dept. of Environmental Sciences, Central University of Kerala
Topic : *The Significance of Microbes in Environmental Sustainability*
Venue : Seminar Hall

SESSION 9 22nd February 2023, 10.00 am

Department of Commerce
Resource : **P.V. Narayanan**
Superintendent of Central Tax, Central GST, Division, Kannur
Topic : *Goods and Services Tax: An Overview*
Venue : Seminar Hall

SESSION 10 22nd February 2023, 10.00 am

Department of Economics
Resource : **Dr. V.K. Vijaykumar**
Chief Investment Strategist, Geojit Financial Services
Topic : *Emerging Economic Scenario: Challenges and Opportunities*
Venue : Library Hall

SESSION 11 22nd February 2023, 10.00 am

Department of Malayalam
Resource : **V.K. Adarsh**
Social Media Evangelist and Writer
Topic : *Vayanayude e-Vazhikal*
Venue : College Auditorium

SESSION 12 22nd February 2020, 1.30 pm

Department of Physical Education
Resource : **Dr. Jayakrishnan Nambiar**
Consultant Orthopaedic Surgeon and IMA President, Thalassery
Topic : *Don't Do Drugs*
2.30 pm : **Zumba Dance by Zin Monika O.**
International licenced zumba instructor.
Venue : College Auditorium

SREE NARAYANA COLLEGE, KANNUR

P.O. THOTTADA, KANNUR - 670 007, KERALA, INDIA
(Affiliated to Kannur University)
NAAC Re-Accredited with 'A' Grade, (CGPA: 3.04), Established in 1960
Website: www.sncollegekannur.ac.in

Dr. Ajayakumar Koorma
Principal

Email: sncollegekannur@gmail.com
drajayan67@gmail.com
Ph: 0497 2731085

Ref: HA | 1457 | 2023

Date: 23-01-23

To

The Member Secretary

Kerala State Higher Education Council

Thiruvananthapuram

Respected Sir

Sub:- Request for academic collaboration with KSHEC for conducting Multidisciplinary Seminar Series Programme "FOCUS 2023"

Our college is planning to conduct a Multidisciplinary Seminar Series "FOCUS 2023" from 15-28 February 2023. Eminent resource persons will handle the sessions in various disciplines. UG, PG students and research scholars are the expected beneficiaries of the programme. I request Kerala State Higher Education Council to collaborate with the event.

Thanking You

Yours faithfully

Principal
PRINCIPAL
SREE NARAYANA COLLEGE
KANNUR

SREE NARAYANA COLLEGE * KANNUR

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

M

Member... 13/2/2023

to me

Dear Principal,
Nonfunded academic collaboration granted. Please send a brief report afterwards.

Warmly,
Dr. RAJAN VARUGHESE
MEMBER SECRETARY
The Kerala State Higher Education Council
Thiruvananthapuram
Former Pro Vice Chancellor
Mahatma Gandhi University ,Kottayam, Kerala

Show quoted text

ayana n 13/2/2023

to Member

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Session-5 12:00 to 01:30

Welcome : Surya S Nair

Chair : Dr.Suja Mariyamma Joshua
(Asso.Prof Nirmalagiri College,Kuthuparamba)

Presentations : 1-Bavitha
(Research Scholar Kannur University)
2-Aswathi.C
(Research Scholar Kannur University)
3-Shyju.P.K
(HSA, Mattannur)

Vote Of Thanks : Fathimath Shafna.C.K

Session-6 02:00 to 03:00

Welcome : Rahila.C.H

Chair : Dr.Vijayan
(Asst.Prof Govt College Elerithattu,Kasargod)

Presentations : 1-Sheeja.M.P
2-Hameema
(Research Scholar Kannur University)
3-Dilna
(Research Scholar Kannur University)
4-Ramish.C
(Research Scholar Kannur University)
5-Rajula.K.V
(Guest Faculty Nileswaram Campus)

Vote Of Thanks : Prajina.P

Session-7 Valedictory Function

DEPARTMENT OF HINDI

PAZHASSI RAJA NSS COLLEGE
MATTANNUR,KERALA 670702

National seminar on

'वैश्विक भाषा के संदर्भ में हिंदी'

18th & 19 November 2022

Organized by
Department of Hindi
PAZHASSIRAJA NSS COLLEGE, MATTANNUR
(Accredited by NAAC with 'B' Grade)

In Association with
College IQAC & S.N.College,Kannur.

आदरणीय महोदय/महोदया,

यह सूचित करते हुए अत्यधिक आनंद का अनुभव हो रहा है कि हिंदी विभाग, पष़्शीराजा एन. एस. एस. कालेज, मट्टन्नूर एवं एस.एन कालेज, कन्नूर के संयुक्त तत्वावधान में वैश्विक भाषा के रूप में हिंदी विषय पर द्विदिवसीय राष्ट्रीय संगोष्ठी आयोजित की जा रही है।

हम तहे दिल से आपका सादर स्वागत करते हैं।

हिंदी विभाग
अध्यक्षा

प्राचार्य

संपर्क: 6282392789

तारीख	: 18 नवंबर 2022
पंजीकरण समय	: 9.00 बजे से 9.30 बजे तक
उद्घाटन सत्र	: 9.30 से 11.15 तक
प्रार्थना	: हिंदी विभाग के छात्र
स्वागत भाषण	: डॉ. लेखा. पी अध्यक्षा, हिंदी विभाग
अध्यक्षीय भाषण	: डॉ. नंत्यत्त गोपालकृष्णन् प्राचार्य, पी. आर.एन.एस.एस.कालेज
मुख्य अतिथि	: डॉ. सुनिता विवेक Padmasree Institute of Management and Science, Banglore
उद्घाटन	: मुख्य अतिथि मुख्य अतिथि का वक्तव्य
आशीर्वचन	: 1.श्री एम.पी उदयभानु निदेशक, बोर्ड सदस्य (एन.एस एस) 2. डॉ. आर.के.बिजु आंतरिक गुणवत्ता आश्वासन सेल, समन्वयक 3. श्री . सुरेष बाबु अभिभावक शिक्षक संघ सचिव 4. अभय जे प्रकाश कालेज विद्यार्थी संघ 5. डॉ राखी राघवन (सिंडिकेट सदस्य) 6.डॉ जी कुमारन नायर भूतपूर्व प्राचार्य पी.आर एन एस एस कालेज 7. डॉ रजनीश कुमार मिश्रा सहायक प्रो केन्द्रीय विश्व विद्यालय, तमिलनाडु
धन्यवाद ज्ञापन	: डॉ. रतिका. पी.के. हिंदी सहायक आचार्य, एस.एन कालेज कन्नूर
बीज भाषण	: 11.15 बजे से 12.15 तक
स्वागत	: डॉ. टैसी जार्ज निर्मलगिरी कालेज, कुत्तुपरंबा
बीज भाषण	: डॉ सुनिता विवेक PIMS, Banglore

अकादमिक सत्र -	1.30 से 3.00 तक
स्वागत	: दिव्या.एम.पी अतिथि अध्यापिका, हिंदी विभाग पी.आर.एन.एस.एस, कालेज
अध्यक्ष	: डॉ. रजनीष कुमार मिश्रा सहायक आचार्य, तमिलनाडु केंद्रीय वि.वि.
प्रपत्र प्रस्तुति	: 1.कुमारी रिनसी. के शोध छात्र, कन्नूर वि.वि. 2.कुमारी इ.टी. अश्विनी शोध छात्र, कन्नूर वि.वि. 3.अश्विनी. पी तमिलनाडु केंद्रीय वि.वि.
धन्यवाद ज्ञापन	: डॉ. विनीत.एम.सी अतिथि अध्यापक, पी.आर.एन.एस.एस कालेज, मट्टन्नूर
अकादमिक सत्र -	3 से 4.30 तक
स्वागत	: डॉ.सुमित.पी.वी सहायक प्राध्यापक, पी.आर.एन.एस.एस कालेज, मट्टन्नूर
अध्यक्ष	: डॉ. जी. कुमारन नायर भूतपूर्व प्राचार्य,पी.आर.एन.एस.एस कालेज, मट्टन्नूर
प्रपत्र प्रस्तुति	: 1.मीनु.के.वी शोध छात्र, कन्नूर वि.वि. 2.षहनास.सी.एस शोध छात्र, कन्नूर वि.वि. 3.दितना.वी. शोध छात्र, कन्नूर वि.वि. 4.प्रियंका.पी. शोध छात्र, कन्नूर वि.वि.
धन्यवाद ज्ञापन	: डॉ.रतिका.पी.के

DEPARTMENT OF CHEMISTRY

NIRMALAGIRI COLLEGE, KUTHUPARAMBA

Re-accredited by NAAC with A++ Grade, Affiliated to Kannur University

Nirmalagiri PO- 670701, Kannur District, Kerala |

E-mail: chemistry@nirmalagiricollege.ac.in, Phone: 0490 2361247

CERTIFICATE OF COLLABORATION

This is to certify that the Department of Chemistry, SN College, Kannur is actively collaborating with the Department of Chemistry of Nirmalagiri College in various academic and research activities for the academic year 2022 – 2023.

1. Undertaking research projects
2. Co-supervising post-graduate and research students
3. Knowledge sharing through faculty exchange

Head

Department of Chemistry,

Nirmalagiri College, Kuthuparamba

Dr. Manjusha Mathew
Assistant Professor
Department of Chemistry
Nirmalagiri College
Kuthuparamba - 670701

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

UNION CHRISTIAN COLLEGE, ALUVA

(Affiliated to Mahatma Gandhi University, Kottayam, Kerala)
Reaccredited with 'A' Grade by NAAC (IV Cycle)

Aluva - 683 102, Ernakulam Dist., Kerala Ph: +91 484 2609194, 8281811703
Email: ucc@uccollege.edu.in Website: www.uccollege.edu.in

Celebrating 100 Years of Meritorious Service

19/07/2022

From
Abhirami K
2nd MSc Zoology
Union Christian College,Aluva

To
Dr. M I Punnoose
The Principal
Union Christian College, Aluva

Dear Sir,

I would like to do my final year MSc project from Sree Narayana College, Kannur, under the guidance of Dr.Preetakumari V.M. I request you to grant me the permission.

Yours sincerely,

Abhirami K

Dr. M. I. Punnoose
Principal In Charge
U. C. College Aluva

UNION CHRISTIAN COLLEGE KERALA INDIA ALUVA-2

As per the request from Abhirami K, (II M.Sc Zoology, Union Christian College, Aluva) I hereby permit to do the Project work under my supervision.

Dr. PREETHAKUMARI V.M.
M.Sc., M.Phil., Ph.D.
ASSISTANT PROFESSOR
DEPARTMENT OF ZOOLOGY
S.N. COLLEGE, KANNUR
KERALA - 670 007

Dr. Preethakumari VM

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

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Aluva - 683 102, Ernakulam Dist., Kerala Ph: +91 484 2609194, 8281811703
Email: ucc@uccollege.edu.in Website: www.uccollege.edu.in

RIMA JOSEPH
Head of the Department of Zoology

Date 27/04/2023

To
Dr. Prasad B O
Head, Department of Zoology
Sree Narayana College, Kannur, Kerala

Sub: Requesting support for the Dissertation of our MSc Zoology Student

Respected Sir,

This is in regards with the dissertation of one of our MSc Zoology student, Ms. Jinisha M at Union Christian College, Aluva, Kerala. She is interested in working on the parasites of marine fishes. Since we do not have the required facility in our department, I kindly request you to guide her with her dissertation work. I request you to provide her with the necessary lab support and guidance for the work during the period of May - June 2023.

Kindly consider this request so that our student can successfully complete her work in your prestigious department.

Thanking You

Yours Sincerely

RIMA JOSEPH
Assistant Professor & HOD
Department of Zoology
Union Christian College
Aluva, Kerala-683 102

UNION CHRISTIAN COLLEGE ALUVA 683 102 DEPARTMENT OF ZOOLOGY

Office: PB No. 5, U. C. College P. O., Aluva - 683 102, Kerala, India
Ph. 91-0484-2609194, Mob. 7012626868. Email: ucc@uccollege.edu.in
Residence: Mob. 9400261397. Email: rimajoseph@uccollege.edu.in

SREE NARAYANA COLLEGE KANNUR P. O. THOTTADA 670007
(AFFILIATED TO KANNUR UNIVERSITY)
NAAC Re accredited with A grade. (CGPA: 3.04)

Dr.Ajayakumar Koorma.
Principal

Email:drajayan67@gmail.com
sncollegekannur@gmail.com
Ph:04972731085

10/02/2023

CERTIFICATE OF COLLABORATION

This is to certify that the Department of Physics, Nirmalagiri College, Kuthuparamba, is actively collaborating with the Department of Physics of our institution in various academic and research activities for the academic years 2018 - 19 and 2022- 23.

Activities currently collaborating on:

1. Undertaking research projects
2. Co-supervising post-graduate and research students (student exchange for research)
3. Knowledge sharing through faculty exchange

SREE NARAYANA COLLEGE * KANNUR *

Principal

PRINCIPAL
SREE NARAYANA COLLEGE
KANNUR

SATHEESH CHERIYAPUT
I attest to the accuracy and
this document
Principal, Sree Narayana C
21.10.2024 16:00

COLLABORATION 2022-23

DEPARTMENT OF MICROBIOLOGY WITH ENVIRONMENTAL SCIENCE DEPARTMENT OF KANNUR UNIVERSITY

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

KANNUR UNIVERSITY
(NAAC Accredited with B++ grade)
DEPARTMENT OF ENVIRONMENTAL STUDIES
Mangattuparamba Campus
Kannur University (PO), Mangattuparamba, Kannur, Kerala - 670567
Tel: 0497 2781043; E-mail : hodevs@kannuruniv.ac.in

No. DES/LOC/01/2023 12/10/2023

CERTIFICATE OF COLLABORATION

This is to certify that the Department of Microbiology, Sree Narayana College, Kannur has been collaborating with us in various domains during the academic year 2022-23. The main interest of collaboration includes the training of students in the research laboratories, interactive sessions with faculties of Department of Environmental Studies and for the analysis of water samples as a part of student project works by utilizing various facilities available at the Department of Environmental Studies, Kannur University.

Dr Pradeepan Peniyat

HEAD
DEPARTMENT OF ENVIRONMENTAL STUDIES
KANNUR UNIVERSITY
MANGATTUPARAMBA, KANNUR
KERALA - 670 567

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

01/12/2023

Students of VI SEM Microbiology at Environmental Science depatment of Kannur University as a part of student Project



SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Physico -Chemical analysis of water samples collected from various rivers in Kannur district

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

NIRMALAGIRI COLLEGE,

Re-accredited by the NAAC with A Grade(III Cycle)
Nirmalagiri P.O., Kannur District
Phone No: 0490-2361247
Web site: www.nirmalagiricollege.ac.in

No. NGL BOT 05/2021

05/01/2021

CERTIFICATE OF COLLABORATION

This is to certify that the Department of Botany, Sree Narayana college, Kannur is actively collaborating with the Department of Botany of our institution in various academic and research activities for the academic years 2021– 2022 and 2022-2023

1. Undertaking research projects
2. Co-supervising post-graduate and research students (student exchange for research)
3. Knowledge sharing through faculty exchange
4. Conducting collaborative add-on/certificate programmes.
5. Conducting capacity building workshops.

5/01/2021

Head
Department of Botany

DEPARTMENT OF BOTANY
NIRMALAGIRI.P.O.
NIRMALAGIRI COLLEGE

Dr. R.D. Anpin Raja
Assistant Professor
Department of Botany
Nirmalagiri College
Kuthuparamba - 670701

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

RESEARCH COLLABORATION 2022-23

DEPARTMENT OF MICROBIOLOGY WITH THE MICROBIOLOGY DEPARTMENT OF ST. PIUS XTH COLLEGE, RAJAPURAM, KASARGOD, KERALA

ST. PIUS X COLLEGE
RAJAPURAM
Rajapuram P.O, Kasaragod, Kerala, India-671532
Phone : 0467 -2224775
Email: stpius@gmail.com, Web: www.stpius.ac.in

Govt.Aided College
Affiliated to Kannur University
Re-accredited by NAAC at 'A' Grade
Managed by Archdiocese of Kottayam

CERTIFICATE OF COLLABORATION

This is to certify that the Department of Microbiology, Sree Narayana College, Kannur has been actively collaborating with the Department of Microbiology of St. Pius X College, Rajapuram in various academic activities include research publications and conducting minor and major projects from 2022 June onwards.

Dr. Vinod. N.V
Asst. Professor & Head

Rajapuram
22.07.2022

Dr. Vinod. N.V
Asst. Professor & Head
Department of Microbiology
St.Pius X College, Rajapuram
Kasaragod - 671532

ST. PIUS X COLLEGE RAJAPURAM KASARAGOD PIN-671532

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

International Book Chapter published by Elsevier

Antimicrobial peptide resistance and scope of computational biology in antimicrobial peptide research

14

C.K.V. Ramesan[1,*], *N.V. Vinod*[2,*] *and Sinosh Skariyachan*[2,*]
[1]Department of Microbiology, Sree Narayana College, Kannur, Kerala, India,
[2]Department of Microbiology, St. Pius X College, Kasaragod, Kerala, India

14.1 Introduction

One of the potential issues overcomes at present is the emerging patterns of antimicrobial resistance. The uncontrolled growth and the explosion of antimicrobial resistance demand an urgent need for an alternative. The best solution to overcome this situation is small peptides having antimicrobial activities, that is, antimicrobial peptides (AMPs) [1]. In recent years AMPs are getting high interest among scientists and pharmaceutical fields because of their high therapeutic properties [2]. AMPs are large classes of low molecular weight protein molecules which are part of the innate immunity of all types of organisms [3]. They are having a broad spectrum of antibacterial, antifungal, antiviral, and antiinflammatory activities [4]. They are highly specific and possess immune-modulatory activities [2]. Because AMPs make bacteria develop low or no resistance, they are highly promising compounds that can be used as an effective alternative to antibiotics [5]. In many bacterial species, one of the major mechanisms of antibiotic resistance is the formation of biofilm. It is found that biofilm formation can be effectively hindered by many of the AMPs. AMPs exhibit broad-spectrum activity against most strains of gram-positive and gram-negative bacteria, including multidrug-resistant strains. Studies of different animal models found that AMPs are also effective in neutralizing toxins [6].

AMPs can be categorized into various classes that include thionins, snakins, defensins, glycine-rich proteins, lipid transferases, cyclotides, and hevein proteins [7]. There are various types of AMPs isolated and characterized from various sources such as plants, animals, and microbes [8]. AMPs are found abundantly in plants and can be extracted from all parts of plants like root, stem, seeds, leaves, and different organs of the plants [9]. In plants, AMPs not only protect plants from microbial diseases but also help in the growth and development of the plant [7]. Another important source of AMPs is insects [10]. A diverse type of AMPs is also

* These authors have equally contributed.

Antimicrobial Peptides. DOI: https://doi.org/10.1016/B978-0-323-85682-9.00007-6

Sitation

Ramesan CKV*, Vinod NV*, Skariyachan S* (2022). Antimicrobial peptide resistance and scope of computational biology in antimicrobial peptide research. Antimicrobial peptides. Challenges and future perspectives, (Eds: K. Ajesh and K. Sreejith). Chapter 14, pp. 261-295. Academic Press, Elsevier. *Equally contributed. (Invited Chapter).

COLLABORATION 2022-23

DEPARTMENT OF MICROBIOLOGY WITH SIR SYED INSTITUTE FOR TECHNICAL STUDIES, TALIPARAMBA, KANNUR

SIR SYED INSTITUTE FOR TECHNICAL STUDIES

(Affiliated to Kannur University)

KARIMBAM P.O., TALIPARAMBA, KANNUR Dt. KERALA - 670 142
Phone : 0460 220 9381, 0460 220 0128, 220 5388
ssitstmba@gmail.com www.sirsyedinstitute.ac.in

CERTIFICATE OF COLLABORATION

This is to certify that the Department of Microbiology, Sree Narayana College, Kannur has been actively collaborating with the department of Biotechnology, Sir Syed institute, Taliparamba in various domains during the academic year 2022-23. The objectives of the collaboration include training of students, interactive sessions, conducting seminars, utilising faculties of both departments for the exchange of knowledge etc.

SIR SYED INSTITUTE FOR TECHNICAL STUDIES

1/12/2022

Dr. Siraj. M.V.P
Associate Professor & Head
P.G. Department of Biotechnology

6 – 10 December 2022

Students of SN College, Microbiology department undergoing training on advanced biotechnology & molecularbiology tools

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

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Principal, Sree Narayana College, Kannur
21.10.2024 16:00

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

13 Jan 2023

Mr. Ramesan. C.K.V, Asst. Professor, Dept. of Microbiology is inaugurating the Biotechnology association at Sir Syed Institute

SATHEESH CHERIYAPUTHALATH
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Principal, Sree Narayana College, Kannur
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ബയോടെക്നോളജി അസോസിയേഷൻ ഉദ്ഘാടനം

തളിപ്പറമ്പ് സർ സയ്യിദ് ഇൻസ്റ്റിറ്റ്യൂട്ട് ബയോ ടെക്നോളജി അസോസിയേഷൻ സി.വി.കെ. രമേഷ് ഉദ്ഘാടനംചെയ്യുന്നു

തളിപ്പറമ്പ▸ സർ സയ്യിദ് ഇൻസ്റ്റിറ്റ്യൂട്ട് ബയോ ടെക്നോളജി അസോസിയേഷൻ കണ്ണൂർ എസ്.എൻ. കോളേജ് കെമിക്കൽ ബയോളജി വിഭാഗം അസി. പ്രൊഫ. സി.വി.കെ. രമേഷ് ഉദ്ഘാടനംചെയ്തു. ഇൻസ്റ്റിറ്റ്യൂട്ട് പ്രിൻസിപ്പൽ ഡോ. ബഷീർ ചൊവ്വ അധ്യക്ഷനായി. ബയോടെക്നോളജി വിഭാഗം മേധാവി ഡോ. എം.വി.പി. സിറാജ്, കെ.പി. ഷബിന, വിദ്യ വത്സരാജൻ, തസ്നീം അൽഹുദ, പി.കെ. അശ്വതി, ഡോ. നീത മാലിക്, പി.വി. മുഹമ്മദ് റാഫി, ഫൗസാൻ അഷ്റഫ്, അനികേത സുധീർ എന്നിവർ സംസാരിച്ചു.

SATHEESH CHERIYAPUTHALATH
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14 February 2023

Students of Sir Syed Institute,SN College students, Teachers and Kudumbasree members undergoing training on mushroom cultivation

SATHEESH CHERIYAPUTHALATH
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7 March 2023

Students of Sir Syed Institute and SN College attended Training on Food safety conducted at SN College, Kannur by Microbiology department

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DEPARTMENT OF CHEMISTRY
MALABAR CHRISTIAN COLLEGE, CALICUT
chemistry@mccclt.ac.in

This is to certify that the Department of Chemistry, Sree Narayana College Kannur is actively collaborating with the Department of Chemistry Malabar Christian College Kozhikode in various academic and research activities for the academic year 2022-2023.

1. Co-supervising post-graduate and research students
2. Knowledge sharing though faculty exchange
3. Undertaking research projects

HoD

Department of Chemistry

Dr. Rema. V.T. M.Sc., Ph.D
Associate Professor
Dept. of Chemistry
Malabar Christian College, Calicut.

CERTIFICATE OF COLLABORATION

This is to certify that the Department of Botany Sree Narayana College Kannur is actively collaborating with the Post Graduate Department of Botany, Sir Syed College, Thaliparamba in various academic and research activities for the academic year 2022-2023.

1. Co-supervising graduate and research students
2. Knowledge sharing though faculty exchange
3. Undertaking research projects

Dr. Sreeja. P

Head of the Department of Botany

Sir Syed College, Thaliparamba

Head of the Department
Dept. of Post Graduate Studies
and Research in Botany
Sir Syed College, Taliparamba
Karimbam, Kannur, Kerala-670142

Kannur

01-06-2022

Dept. of PG Studies & Research in Botany
Sir Syed College, Taliparamba
Date.....

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Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Dr. Muhammad Ismayil K. M
Asst. Professor & HOD
Dept. of Polymer Chemistry
N.A.M College, Kallikkandy, Kannur, Kerala, India 670 691
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CERTIFICATE OF COLLABORATION

This is to certify that the Department of Chemistry, Sree Narayana College Kannur is actively collaborating with the Department of Polymer Chemistry, N.A.M College Kallikkandy in various academic and research activities for the academic year 2022 -2025.

1. Co-supervising in graduate level internal evaluation
2. Knowledge sharing though faculty exchange
3. Undertaking project works

16/12/23

Dr. MUHAMMAD ISMAYIL. K.M
Asst. Professor & HOD
Dept. of Polymer Chemistry
N.A.M College, Kallikkandy
Kannur, Kerala - 670 693

HOD
Department of Polymer Chemistry
N.A.M College Kallikkandy

Kallikkandy
01-06-2022

PAYYANUR COLLEGE, PAYYANUR

(AFFILIATED TO KANNUR UNIVERSITY, ACCREDITED BY NAAC AT B LEVEL)

EDAT POST, KANNUR DIST., 670327, PH: 0497 2805121, 2805521

Email : payyanurcollege@rediffmail.com

DEPARTMENT OF MANAGEMENT STUDIES

COLLABORATION AGREEMENT FOR ACADEMIC CO-OPERATION

This Collaboration agreement is executed on this 2nd day of July 2022 between **THE DEPARTEMNT OF MANAGEMENT STUDIES, PAYYANUR COLLEGE, PAYYANUR**, represented by Mrs. ARCHANA K. Assistant Professor and Head, Department of Management Studies, Payyanur College, Payyanur on the first part

AND

THE DEPARTMENT OF MANAGEMENT STUDIES, S.N. COLLEGE, KANNUR, Represented by Mr. **SUMESH P C**, Assistant Professor and Head, Department of Management Studies, S.N.college, Kannur on the second part to share resources for mutual benefit on the following areas.

1. *On conducting programmes on career guidance and higher studies for students of UG Courses.*

2. *On conducting programmes in areas of academic and research expertise of the faculty of both the colleges*

3. *Collaborating on student projects, as external mentor*

4. *Any other areas of mutual interest that enlerge from time to time.*

This agreement is valid for five years or till any one party wish to withdraw with written reasons, whichever is earlier.

Signature of the first party

ARCHANA. K.
ASSISTANT PROFESSOR
HEAD OF THE DEPARTMENT
DEPARTMENT OF MANAGEMENT STUDIES
PAYYANUR COLLEGE, PAYYANUR
EDAT P.O., KANNUR-670 327

P.O. EDAT 02/07/2022

Signature of the second party

SUMESH P.C.
Asst. Professor & Head
Dept. of Management Studies
Sree Narayana College
Thekkada, Kannur 670 007

SATHEESH CHERIYAPUTHALATH
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REPORT

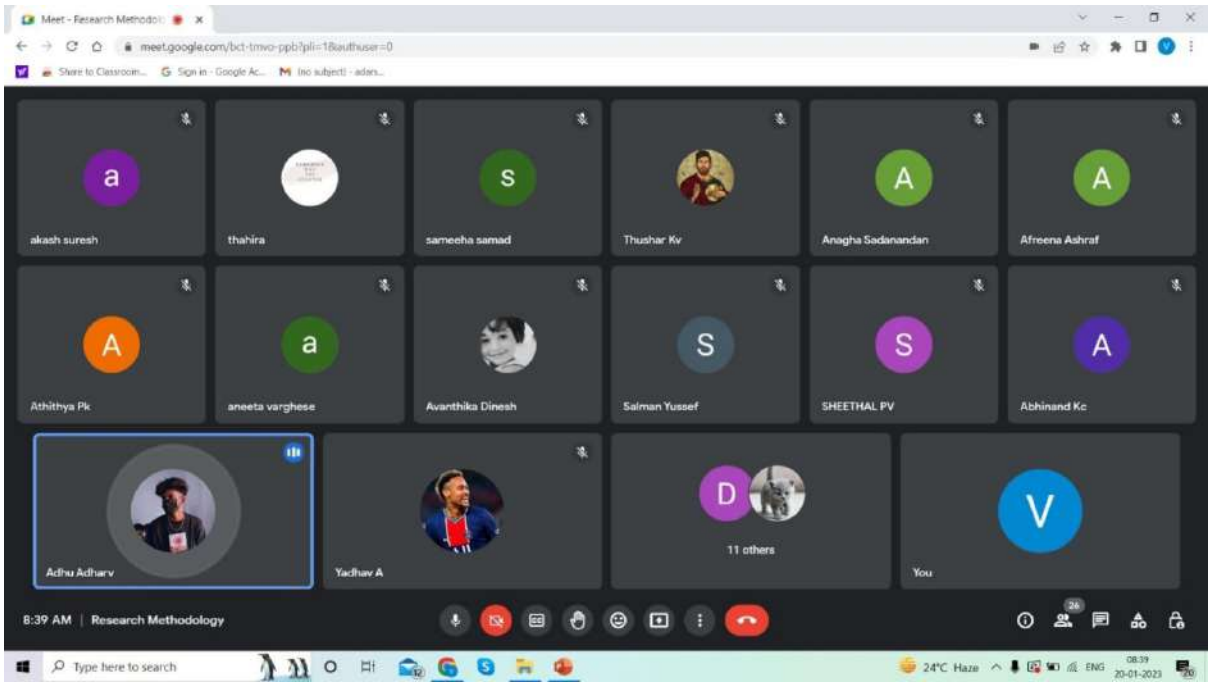
The Department of Management Studies at S. N. College Kannur and Payyannur College, Payyannur have entered into a collaborative partnership on 02/07/2022 with the aim of enriching the educational experiences of their students, promoting interdisciplinary research, and fostering a spirit of academic excellence. This collaboration represents a significant step toward strengthening the academic ties between the two institutions.

2022-23

20/01/2023: An Online Session on Research Methodology & Guidance in Project Work

An Online Session on Research Methodology & Guidance in Project Work was organised for the final year BBA students of S.N College, Kannur and Payyanur College. The session, conducted via Google Meet held at 8.00 pm, aimed to provide valuable insights and guidance on project work, with a focus on research methodology. Dr Vigi V Nair, Assistant Professor, Department of Management Studies conducted the session. The session was covered various aspects of project work and research methodology, offering students a clear roadmap for their final year projects. She discussed the key steps and methodologies involved in conducting

research for a project, including data collection, analysis, and interpretation. 42 students were actively participated in discussions and asking relevant questions.



CERTIFICATE OF COLLABORATION

This is to certify that the Dr.Jithesh K, Assistant Professor, Department of Chemistry, Sree Narayana College Kannur is actively collaborating with Dr. Shabbeba Pilathottathil , Assistant Professor Department of Electronics Malabar College of Advance Studies, Vengara, Malappuram in various academic and research activities for the academic year 2022-2024.

1. Co-supervising post-graduate and research students
2. Knowledge sharing though faculty exchange
3. Undertaking research projects

Dr. Shabbeba Pilathottathil
Department of Electronics
Malabar College of Advance Studies

Kozhikode
01-06-2022

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Recent developments in the adsorptive removal of heavy metal ions using metal-organic frameworks and graphene-based adsorbents

Pinnanath Neethu Das [a], Kavil Jithesh [b], Kovummal Govind Raj [a,*]

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Metal-organic framework
Water purification

ABSTRACT

Clean and potable water is a growing concern around the globe. Among the different water pollutants, heavy metal ions pose a serious health concern to all living beings. The quest for new adsorbents to remove heavy metal ions received a boost with the development in the field of metal-organic framework (MOF). The advancement in synthetic strategies and designing of MOF enabled the researchers to tune the adsorption characteristics and tailor the material specific to a heavy metal ion. Similar to MOF, graphene-based two-dimensional and three-dimensional materials are also promising due to the diverse functionalization possibilities and cost-effectiveness. There had been growing interest in applying MOF and graphene-based materials for the removal of heavy metal ions in the past decade. This review summarizes these developments in detail.

1. Introduction

The scarcity of clean water has been an ever-rising concern for humanity. The factors such as urbanization, population growth, industrial production, climate change, uncontrolled mining, etc., are the major contributions to the deterioration of water quality [1]. As we all know, the most common and highly dangerous water pollutants are heavy metals [2–4]. Based on the health importance, heavy metals are classified into four categories such as essential metals (Cu, Zn, Co, Cr, Mn, and Fe), non-essential metals (Ba, Al, Li, and Zr), less toxic metals (Sn and As) and highly toxic metals (Hg, Cd, and Pb) [5]. Due to the extreme health hazards of heavy metal pollution, the harmful effect of metal ions and their removal methods has been extensively studied [6–10].

The conventional water treatment techniques include coagulation-flocculation, solvent extraction, reverse osmosis, electrodialysis, ion flotation, ion exchange, and adsorption [11–17]. Among all these methods, adsorption is the most accepted and widely used method due to its simplicity and efficiency. The various adsorbents include activated carbon, chitosan, zeolites, and clays [18–21]. Among the various adsorbents, activated carbon is the most preferred adsorbent due to its low cost and availability [22,23]. However, the disordered structure of amorphous carbon restricts the fundamental studies and structural optimization for improved removal performance [24]. Therefore there is a decline in the acceptability of activated carbon in the large-scale application for water treatment.

With the recent growth of nanotechnology, a new class of adsorbents has emerged, which has much more efficiency and selectivity when compared to conventional adsorbents [25]. Such nano-adsorbents include carbon nanotubes [26–28], iron oxides [29,30], MOFs [31,32], graphene-based materials [33,34], manganese dioxide-based nanomaterials [35,36] etc. These nano-adsorbents are promising candidates in environmental remediation due to their high surface to volume ratio, surface modifiability, reversibility, biocompatibility, and selectivity. The surface modification of nano-adsorbents is known to enhance the selectivity of nano-adsorbents towards a particular pollutant [37].

MOFs are considered to be an excellent platform for removing toxic materials from water because of their fascinating structure and salient physical properties like tunable pore size, large pore volume, high specific surface area, and the possibility of case-specific tailoring of basic molecular architecture [38]. The structure of a MOF can be engineered by the careful choice of a metal ion and an organic linker. By grafting various functional groups such as those bearing different polarity, acidity, hydrophilicity, and by tuning the size of the organic linkers, respectively, the pore sizes and pore/surface properties of MOFs can be adjusted. Functionalization can be achieved by using organic linkers during the synthesis or by a post-synthetic modification route. Post-synthetic modification is an effective and practical tool for the modification of the structure and properties of MOFs. Functionalization

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MoS_2 incorporated carbon allotropes (activated carbon, graphene, MWCNT) as electrodes in symmetric supercapacitors

Shabeeba Pilathottathil [a,c,**], Jithesh Kavil [b,*], Mohamed Shahin Thayyil [a]

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ARTICLE INFO

Keywords:
Symmetric supercapacitor
Activated carbon
Graphene
MWCNT,MoS_2

ABSTRACT

Symmetric supercapacitor devices were fabricated from MoS_2 incorporated carbon allotropes such as activated carbon (AC)/MoS_2, graphene/MoS_2 and MWCNT/MoS_2. The device performance was evaluated using cyclic voltammetry (CV), galvanostatic charge-discharge (GCD), and electrochemical impedance spectroscopy (EIS). The electrochemical properties of the devices fabricated from carbon allotropes (activated carbon, graphene, MWCNT) were remarkably enhanced to above 50% by the incorporation MoS_2 phases. Out of the three fabricated devices, electrochemical performance of AC/MoS_2 as found to be superior. The specific capacitance and energy density of this device is 216 F/g and 6.2 Wh/Kg respectively with excellent higher rate capability and longer cyclic durability. The devices fabricated from graphene/MoS_2 and MWCNT/MoS_2 has exhibited a specific capacitance value of 202 F/g and 161 F/g with an energy density value of 5.68 Wh/Kg and 3.95 Wh/Kg respectively.

1. Introduction

The world economy demands the need of sustainable renewable energy technology for a clean development mechanism by reducing carbon footprint. Functional materials that can convert and store renewable energy have received a significant attention in recent years. The current technologies such as photovoltaics, wind turbines, geothermal power plants, etc. are highly viable for renewable energy conversion to electric energy; however the storage of this intermittent source of energy is the bottle-neck in sustainable energy management. Supercapacitors/Ultracapacitors has emerged as novel alternative for the conventionally using batteries and capacitors due to its high power delivery, quick charge-discharge capability, wide range of operating temperature and environmentally benign assembly, thus the device become popular in almost all fore-front areas of technological development [2].

Allotropes of carbon such as activated carbon, graphene, multi-walled carbon nanotubes are preferred as the electrode materials for supercapacitor applications owing to its high surface area, excellent conductivity, low density and porosity [3]. However the energy density and rate capability of the devices fabricated from these pristine carbon allotropes are found to be very small owing to it electrical double layer (EDLC) nature of charge storage mechanism. In the case of graphene and MWCNT the electrode fabrication process is very difficult due to aggregation and stacking of the materials, thus the electrochemical properties of the device deteriorate after each cycle [4]. Moreover the theoretical densities of these materials are quite less which hinders the higher mass loading across the electrodes. Recent advances in hybrid materials of carbon allotropes with pseudo-capacitive materials indicates that the energy density and electrochemical properties of activated carbon, graphene, multi-walled carbon nanotubes can be enhanced considerably by the introduction of synergism between EDLC and pseudo-capacitive nature [5]. Moreover the pseudo-capacitive phases can acts as a spacer in between the 2D layers and 1D tubes of graphene, MWCNT respectively which reduces the chance for agglomeration/stacking during electrochemical process [6]. Rakhi et al., reported an enhanced electrochemical performance of carbon nano coils (CNC) by hybridizing with nanocrystalline semiconductor oxides such as SnO_2, MnO_2 and RuO_2 [6]. In an another report Liu et al., recently developed oxygen vacancy rich Co_3O_4/graphene nano-structures with an excellent specific capacitance value of 978.1 Fg^{-1} at a current density of 1 Ag^{-1}in three electrode configuration [7]. The electrochemical properties of activated carbon were also modified by various methods by metal oxide incorporation.

Transition metal dichalcogenides such as MoS_2 have recently received great deal attention among pseudo-capacitive materials due to

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Boosting ion dynamics by developing graphitic carbon Nitride/Carbon hybrid electrode materials for ionogel supercapacitor

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ARTICLE INFO

Keywords:
Supercapacitor
GCN hybrids
Ionogel

ABSTRACT

g-C_3N_3 (GCN) have been used as supercapacitor electrode due to its tunable structure and high carbon–nitrogen ratio, However, the poor conductivity and very low surface area remain a challenge for practical applications. The formation of a hybrid structure of GCN with carbon-based materials such as activated carbon (AC), graphene (G), and carbon nanotube (CNT) help to improve its electrochemical properties. In this work, we synthesized GCN-AC, GCN-G and GCN-CNT hybrid structures and studies the electrochemical properties in symmetric two electrode configuration. The obtained specific capacitance of GCN, GCN-G, GCN-CNT and GCN-AC 11F/g, 244F/g, 237F/g and 266F/g, respectively. The energy density and voltage window of the GCN-AC device were enhanced by replacing the conventional electrolyte with ionic liquid gel electrolyte. The ionogel mediated device could achieve an enhanced specific capacitance of 303F/g with an energy density of 46.45 Wh/Kg and power density of 750 W/Kg.

1. Introduction

The post industrialization have created rapid chaos in our climate due to unprecedented carbon emission which resulted in heat waves, heavy rain falls and irreversible sea level rise. The experts warns the urgent need for the development of an efficient, sustainable and pollution-free energy technology to reduce our carbon foot print [1]. Hence, materials and devices for storage and conversion of energy from renewable energy sources have received significant attention in recent years. The bottle neck in renewable energy technology is the storage of intermittent energy [2]. Lithium ion batteries have been used conventionally as storage device. They use electrochemical mechanism to store energy, that will results in low power delivery and short life of the device. Subsequently, supercapacitor or ultracapacitors appeared as a novel alternative for lithium ion battery. They store charge electrostatically and having high energy density of a battery as well as the high power density of a capacitor [3,4].

To improve their performance, different strategies were cast-off as the use of high capacitive materials with high effective pseudocapacitive materials, better electrolytes having enhanced voltage window keeping in view other practical considerations. Carbonaceous materials such as activated carbon, graphene and carbon nanotubes (CNTs) are commonly used as electrode materials in supercapacitor fabrication, which is known as an electric double-layer capacitor (EDLC) [5]. But still, the systems suffer from low energy density and lower life cycle, which suppresses the practical applications of carbon based materials. Thus for the realization of supercapacitors, it necessary to design a balanced structure and morphology to increase the electrochemical performance of these carbon-based materials.

The introduction of heteroatoms such as sulfur/nitrogen/phosphorous in the carbonaceous materials can improve electron –donor ability which can further enhance their electrical conductivity by breaking the electroneutrality and density of state [6]. Among these functionalization techniques, the heterostructure with nitrogen doping shows improved results because of its higher electronegativity that effects the net positive charge on the carbon atom in its neighbourhood [7,8]. According to the theoretical prediction, these are the reason for properties enhancements; only one extra electron will be added to the system if carbon is replaced by nitrogen since they are neighbours, the radii of carbon and nitrogen are the same which will help to avoid mismatch of atomic size during functionalization. Further, the nitrogen doping can enhance the electrical conductivity and storage capacity of carbon-based materials [9]. Thus nitrogen functionalization is the key to solve issues regarding carbon-based systems in energy storage applications.

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Research article

Room temperature ionic liquids encapsulated PVDF-HFP gel electrolytes for flexible supercapacitors

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ARTICLE INFO

Keywords:
Ionic liquids
PVDF-HFP
Gel electrolytes
Flexible supercapacitors
Electrochemical impedance spectra
Charge discharge

ABSTRACT

Room Temperature Ionic Liquids (RTILs) offer significant potential in electrochemical applications due to their flexibility, mobility, and diverse anionic and cationic combinations. To fabricate flexible devices, ionic liquid electrolytes require additional encapsulation to address the limitations of aqueous electrolytes. In this study, solid-state gel electrolytes (SSE) composed of RTILs with different cations, such as phosphonium [P66614], sulphonium [S66614], ammonium [N66614], and anions, such as dicyanamide [DCA], imide [NTf2], and chloride [Cl], were dispersed within a poly(vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) polymer matrix. Their electrochemical performances were evaluated using cyclic voltammetry, galvanostatic charge-discharge analysis, and electrochemical impedance spectroscopy. The physicochemical properties were analyzed using X-ray diffraction, thermal gravimetry, and broadband dielectric spectroscopy. Among the fabricated devices, the gel-electrolyte [S66614][NTf2] combined with PVDF-HFP, having sulphonium [S66614] and ammonium [N66614] cations demonstrated superior electrochemical performance compared to the others.

1. Introduction

Polymers have been studied extensively for developing solid state electrolytes, and they are typically categorized based on their structural properties. One promising polymer group is the poly-vinylidene fluoride-co-hexafluoropropylene (PVDF-HFP) copolymer, which has garnered attention due to its unique characteristics. PVDF-HFP contains strong electro-withdrawing functional groups (-F), resulting in a high dielectric constant (ε=8.4). Dissolving room temperature ionic liquids (RTILs) in PVDF-HFP helps to maintain a high concentration of charge carriers [1,2]. The PVDF-HFP copolymer exhibits a distinct binary-phase structure consisting of amorphous and crystalline phases. The amorphous HFP provides enormous pockets for trapping significant amount of liquid, while the crystalline PVDF units offer mechanical support [3]. Additionaly, PVDF-HFP provides exceptional properties including good temperature resistance, chemical and corrosion resistance [4]. In this study, PVDF-HFP was combined with room temperature ionic liquids (RTILs) to develop solid polymer electrolytes, utilizing its mechanical strength and ability to create an ion pathway by adjusting the segment ratio of its crystalline and amorphous phases. Five different RTILs, namely $[P_{66614}][NTf_2]$, $[P_{66614}][DCA]$, $[P_{66614}][Cl]$, $[N_{66614}][NTf_2]$, and $[S_{66614}][NTf_2]$, were selected for the preparation of PVDF-HFP based polymer electrolytes. Frequency-dependent conductivity measurements were conducted, and the performance of the supercapacitor devices was evaluated.

2. Methodology

2.1. Preparation of RTIL encapsulated PVDF-HFP solid electrolyte

The ionic liquids (Aldrich India) selected for solid state electrolyte were methyl-trioctyl ammonium bis(trifluoro methyl sulfonyl) imide $[N_{66614}][NTf_2]$, trihexyl tetradecyl phosphonium bis(trifluoro methylsulfonyl) imide $[P_{66614}][NTf_2]$, triethyl sulfonium bis(trifluoro methylsulfonyl) imide $[S_{66614}][NTf_2]$, trihexyl tetradecyl phosphonium bis (trifluoro methylsulfonyl) dicyanamide $[P_{66614}][DCA]$, and trihexyl tetradecyl phosphonium bis(trifluoromethane sulfonyl) chloride $[P_{66614}][Cl]$.

The PVDF HFP based solid electrolytes were prepared by using the solution casting technique. PVDF-HFP was dissolved in acetone with the aid of a magnetic stirrer at room temperature to obtain a transparent solution. Then, 25 wt% of various ionic liquids were added to the

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MEMORANDUM OF UNDERSTANDING

Between

ANTON'S MEDICODE

Seenai Center, Angamaly,Ernakulam, Kerala 683572

And

SREE NARAYANA COLLEGE

Thottada PO, Kannur, Kerala 670007

PRINCIPAL
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KANNUR

SREE NARAYANA COLLEGE * KANNUR *

Neethu Varghese
Managing Director
Anton's Medicode

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12.04.2023
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SUB TREASURY
10 APR 2023
ANGAMALY - 683572

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Angamaly

കേരളം केरल KERALA EA 651330

This Memorandum of Understanding made on 08/05/2023 between **Anton's Medicode – Seenai Center, Angamaly, Ernakulam, Kerala 683572**(the first party) represented by the **Managing Director,Ms. Neethu Varghese**, hereafter called **AMC** on the one part and**Sree Narayana College, Thottada PO, Kannur, Kerala 670007** (the second party) represented by **The Principle**, hereafter called the Institution on the other part.

Whereas the Institution has decided to offer the AMC course Medical coding & Billing from AAPC – American Association of Professional Coders, USas add-on course to their students using the infrastructure available at the institution and requested AMC to render academic assistance for the successful implementation of the program. Other details such as duration, eligibility and syllabus of courses offered is attached as Annexure I.

Neethu Varghese
Managing Director
Anton's Medicode

PRINCIPAL
SREE NARAYANA COLLEGE
KANNUR

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ANGAMALY - 683572

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SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
24.10.2024 16:00

No 1309 @100
12.05.2023

NOW IT IS MUTUALLY AGREED AS FOLLOWS:

1. The students enrolled for this add-on course leads to the additional qualification from First party/ Membership from the respective professional organization only for the candidates appearing and clearing CPC Examination.
2. It is the responsibility of the First Party to get the necessary accreditations from the professional body (AAPC). The final approved syllabus by AAPC for the add-on course with the exemptions availed from professional bodies through program accreditation process will be given as Annexure 1 (Syllabus).
3. Second Party agrees to provide all infrastructure necessary to conduct the course at the premises of the Institution and the first party agrees to conduct offline/Hybrid classes of the add-on course at the assigned location only.
4. The Second Party shall nominate a point of contact (POC) for co-ordination of this programme.
5. The admission criteria, after the approval by the first partyis stated in Annexure 3. The same shall be upheld for short listing all applicants. The number of seats for the above said program are fixed by the Second Party. The complete list of students of the course shall be provided to the First Party by the Second Party. Changes in students, if any, shall be communicated by the representative of the Second Party to the First Party immediately.
6. The First Party facilitates necessary certified trainers, consulting, and technical support to the Second Party.
7. Classroom teaching shall be fixed according to the schedule prepared by the first party and the second party jointly without causing inconvenience to the regular conduct of classes in the College.
8. The First Party provides Study materials as well as sufficient library copies for reference of all learning materials (For the subjects accredited by the professional body) to the students enrolled for the above said add on course.
9. Classes are to be evaluated jointly by both the parties every month. Suggestions made by the Second Party will be considered for optimizations. Classes shall be handled to

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SATHEESH CHERIYAPUTHALATH
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Principal, Sree Narayana College, Kannur
21.10.2024 16:00

PRINCIPAL
SREE NARAYANA COLLEGE
KANNUR

the best satisfaction of the students and Second Party as stated in the Academic Calendar

10. The mode of the class will be inOffline/Hybrid and Minimum number of students will be 40 Nos.
11. The First Party provides exam-oriented training support to the students enrolled for the above add on course for their external examinations of the professional body. The number of hours per subject / paper/module as given in Annexure 2.
12. The students enrolled for the add on course are given the opportunity to attend the examinations of certificate in CPC of AAPC as a part of their program. First party (Anton's Medicode) only provides the registration services to the students who are willing for CPC Examination and the amount is a separate payment which is done by the student through online site of AAPC.
13. Once the registration process is complete first party will provide 1month CPC examination training prior to examination date only through online mode.
14. All responsibilities regarding registration of the students who are appearing for CPC Examination with the professional body should be dealt with, by the First Party. The students must follow the rules and regulations of respective professional body to appear for the examination and pursue the qualifications/memberships and designations.
15. The relevant fee to the professional body must be paid by the students directly as per the rules and regulations set by the professional body time to time as given in Annexure 2.
16. As per the schedule, courses must be completed by 6 months, duration of 100 hours weekly 5 hours, if any delays happening due to holidays or other issues First party have the right to complete the course through additional online hours, if necessary, in the above-mentionedtime period.
17. Classes for the students are scheduled classes only on Saturdays from morning 10 AM to 1 PM and 2 PM to 4 PM.
18. The students must obligatorily complete add-on coursewith 90% attendance, 70% marks in the final test conducted by the First party to get the course completion certificate provided by the first party.

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21.10.2024 16:00

19. Placement assistance will be provided only for the students who have completed their pursuing degree from the second party. The second party must provide the course completion certificate before conducting the interview.
20. The first party agrees to maintain bound and numbered Registers for the following which will be shared with Second party on request:
    a. Register showing the names of students enrolled in the add-on course.
    b. Register of Attendance of students, separate for each batch.
    c. Register showing the receipt of fees and structure of fees, separate for each batch.
    d. Register showing the Names, Age, Educational Qualification, Experience, and Date of joining of the faculty members.
    e. Register of Attendance of the faculty members.
    f. Attested copies of the Qualifications and Experience of the faculty members.

    The first party shall maintain the above registers and records up to date and shall make them available for inspection by authorized personnel of the second party. The second party or anyone authorized by it shall be entitled to conduct inspection of the above records as well as the premises of the Institution on any normal working day/hours without any prior intimation to the Institution.
21. This is for the student's during the academic year 2023-2024. The course fees can be revised if mutually agreed by the two parties. If the first party is found levying course fees from the students at rates exceeding that agreed upon by the second party or adopting any unfair means in fee collection, the first party shall be liable to endure legal action taken up by the second party.

Note:The below special fee is applicable if the minimum number of students is more than 40 Nos.

Particulars	**Amount**
Total Fees	**Rs. 12,000 + GST**
1st Installment	Rs. 6000 + GST
2nd Installment	Rs. 6000 + GST

1st Installment - Enrollment Date.

2nd Installment - After one month from Enrollment Date.

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21.10.2024 16:00

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22. Use of name or logo of **Sree Narayana College, Kannur** in displays, advertisements or promotions shall be done by First Party with the prior approval of Second Party only and Second Party will not bear any liability whatsoever for any issue arising out of that.
23. The duration of the agreement shall be minimum one year; however, the same may be renewed further on mutual consent of both the parties. Both parties reserve the right to terminate the MoU agreement, if it is found that the other party has indulged in any malpractice or has violated any of the conditions and guidelines of operation.
24. Either party shall be titled to terminate the MOU on 60days 'notice. The MOU will automatically terminate.
25. The First party shall hold the second party's interest's paramount, without any consideration for future work, and strictly avoid conflict of interest with other assignments or their own interests. If during the period of this contract, a conflict of interest arises for any reasons, the first party shall promptly disclose the same to the second party and seek its instructions.
26. Disputes arising out of this agreement shall as far as possible be settled by the parties directly. In case of disagreement, the same shall be subjected to the provision of Indian Arbitration and Reconciliation (Amended) Act, 2015
27. In the event of the termination of the agreement, the First Party agrees to complete the existing batches on agreed terms contained in this MOU.
28. Neither party shall be liable to the other for any delay or failure on its part in performing any of its obligations under this agreement, resulting from any cause beyond its control, including but not limited to strikes, fires, floods, earthquakes, explosions, riots, acts of Governments, war or enemy action, provided the same is issued in writing to the other party within 15 days of such incident.

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Parties hereby abide and submit themselves to these conditions and stipulations and to perform their part, respectively with honorable intentions and for mutual benefit so as to conduct the program smoothly.

For,**Anton's Medicode**

Signature:

Name: Neethu Varghese
Managing Director
Anton's Medicode

(seal) :

Anton's Medicode
AAPC APPROVED INSTITUTE
Angamaly, Ernakulam - 683 572

Witness

JINS GEORGE
MANAGER - BD
ANTONS MEDICODE

For,**Sree Narayana College, Kannur**

Signature:

Name: Dr K. P. PRASANTH

(seal) :

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KANNUR

Witness

Sumesh P.C.

Annexure 1 – Syllabus

MEDICAL TERMINOLOGY

ANATOMY

ICD-10 CM

CPT

HCPCS

MEDICAL BILLING

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Annexure 2

Medical Coding

Subject	Hours of Training
ANATOMY	30
ICD	30
CPT	40
Soft Skill Training, Mock Test& Mock Interview	

ADDITIONAL FREE ONLINE EXAMINATION TRAINING OF 1 MONTH FOR CPC EXAM REGISTERED CANDIDATE

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Annexure 3

Please Note: The fee for AAPC Individual Membership and CPC Certification Exam registration can be found on the URL given below and it is subject to the discretion of AAPC (professional body)

https://www.aapc.com/certification/cpc

Eligibility criteria of applicant

- A bachelor's degree of minimum 3 years after 10^{th} or 12^{th} examination, from a recognized board with a minimum aggregate of 50%.
- Candidates of final year of graduation are also eligible, provided they have a certificate from the head of the college.
- Candidate must have completed medical coding course from any authorized institute.

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ACCREDITED BY NAAC WITH 'A' GRADE (AFFILIATED TO KANNUR UNIVERSITY)
Sree Narayana College Kannur, P.O. Thottada, Kannur,Kerala , India - 670 007
sncollegekannur@gmail.com 0497 - 2731085
www.sncollegekannur.ac.in

3.5.1

Number of functional MoUs/linkages with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years.

List and Copies of Documents indicating MoUs / linkage/ Collaborations Yearwise

2023-24

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KSSC/C1/6585 /2023

07-06-2023

മെമ്മോ

സൂചന: കോളേജ് സ്പോർട്സ് അക്കാഡമിയിലേക്കുള്ള സെലക്ഷൻ സംബന്ധിച്ച്

കേരള സ്റ്റേറ്റ് സ്പോർട്സ് കൗൺസിലിന്റെ 2023-24 വർഷത്തിലേയ്ക്കുള്ള കോളേജ് സ്പോർട്സ് അക്കാഡമി സകീമിലേക്ക് താങ്കളെ യോഗ്യത ടെസ്റ്റിന്റെ അടിസ്ഥാനത്തിൽ തെരഞ്ഞെടുത്ത വിവരം അറിയിച്ചുകൊള്ളുന്നു. താഴെപറയുന്ന ജില്ല /കോളേജ് സ്പോർട്സ് അക്കാഡമിയിലേക്കാണ് താങ്കൾക്ക് പ്രവേശനം അനുവദിച്ചിട്ടുള്ളത്.

Discipline & Category	**FOOTBALL- MALE**
Name	**NAZIN.K.T**
Address	**AMINA'S PAPPINISERI, KANNUR, 670561**
Name of District / College Sports Academy allotted	**SN College , Kannur**

യോഗ്യതാ പരീക്ഷയുടെ മാർക്ക് ലിസ്റ്റും, കായിക പരിശീലനത്തിന് ആവശ്യമായ ശാരീരിക ക്ഷമതനയുണ്ടെന്നു തെളിയിക്കുന്ന അസി. സർജ്ജന്റെ ഗ്രേഡിൽ കുറയാതെയുള്ള ഡോക്ടറുടെ മെഡിക്കൽ സർട്ടിഫിക്കറ്റും ഈ മെമ്മോയുമായി ജില്ല സ്പോർട്സ് കൗൺസിൽ സക്രട്ടറിയെ ബന്ധപ്പെടേണ്ടതാണ്. ജില്ലാ സ്പോർട്സ് കൗൺസിൽ അതാത് അക്കാഡമിലേക്ക് കുട്ടികളെ നിയോഗിക്കുന്നതാണ്.

സ്പോർട്സ് അക്കാഡമിയിലേക്കുള്ള പ്രവേശനം പൂർത്തിയായ ശേഷം മാത്രമേ പഠിച്ചിരുന്ന സ്കൂളിൽ നിന്ന് ടി.സി വാങ്ങാൻ പാടുള്ളൂ. പ്രവേശനം പൂർത്തിയായ ശേഷം താമസത്തിനുള്ള കിടക്ക, ഷീറ്റ്, ഭക്ഷണം കഴിക്കുന്നതിനാള്ള പാത്രം, കായിക പരിശീലനത്തിനുള്ള വസ്ത്രം 1000/- രൂപ കോഷൻ ഡിപ്പോസിറ്റ് (സെൻട്രലൈസ്ഡ് സ്പോർട്സ് അക്കാഡമികൾക്ക് മാത്രം) തുടങ്ങിയവ സഹിതം അക്കാഡമിയിൽ എത്തേണ്ടതാണ്.

ജില്ല / കോളേജ് സ്പോർട്സ് അക്കാഡമിയുടെ നിയമം വളരെ കർശനമായി പാലിക്കേണ്ടതാണ്. നിയമത്തിന് വിരുദ്ധമായി പ്രവർത്തിക്കുന്നവരെ യാതൊരു മുന്നറിയിപ്പും കൂടാതെ സ്പോർട്സ് അക്കാഡമിയിൽ നിന്നും പുറത്താക്കുന്നതാണ്.

അക്കാഡമിയിലേക്ക് അഡ്മിഷൻ ലഭിക്കുമ്പോൾ 200 രൂപയുടെ മുദ്രപത്രം (കുട്ടിയുടെ രക്ഷകർത്താവിന്റെ പേരിൽ വാങ്ങിയത്) കൊണ്ടുവരേണ്ടതും കരാർ ഒപ്പിഷേണ്ടതുമാണ്. കൂടുതൽ വിവരങ്ങൾക്ക് താഴെപ്പറയുന്ന ഫോൺ നമ്പരുമായി ബന്ധപ്പെടേണ്ടതാണ്.

സെക്രട്ടറി

യു. ഷറഫലി
പ്രസിഡന്റ്
ഫോൺ : 0471 - 2331546, 2325883
ഇ-മെയിൽ : president.kssc@gmail.com

ലീന. എ
സെക്രട്ടറി
ഫോൺ : 0471 - 2331546
ഇ-മെയിൽ : secretary1.kssc@gmail.com

Kerala State Sports Council Statue, Thiruvananthapuram - 695 001
Phone: 0471-2330167, 2331546, Email : keralasportscouncil@gmail.com. Web Site : sportscouncil.kerala.gov.in

'ഭരണഭാഷ മാതൃഭാഷ'

KSSC/C1/6585 /2023

21.07.2023

മെമ്മോ

സൂചന: കോളേജ് സ്പോർട്സ് അക്കാഡമിയിലേക്കുള്ള സെലക്ഷൻ സംബന്ധിച്ച്

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Discipline & Category	FOOTBALL
Name	MUHAMMED MUQTHARJASEEM TKB
Address	K.K.HOUSE PADNEKADAPP URAM PO PADNE KADAPPURAM KASARAGOD 671312
Name of District / College Sports Academy allotted	S.N COLLEGE KANNUR

യോഗ്യതാ പരീക്ഷയുടെ മാർക്ക് ലിസ്റ്റും, കായിക പരിശീലനത്തിന് ആവശ്യമായ ശാരീരിക ക്ഷമതനയുണ്ടെന്നു തെളിയിക്കുന്ന അസി. സർജ്ജന്റെ ഗ്രേഡിൽ കുറയാതെയുള്ള ഡോക്ടറുടെ മെഡിക്കൽ സർട്ടിഫിക്കറ്റും ഈ മെമ്മോയുമായി ജില്ല സ്പോർട്സ് കൗൺസിൽ സക്രട്ടറിയെ ബന്ധപ്പെടേണ്ടതാണ്. ജില്ലാ സ്പോർട്സ് കൗൺസിൽ അതാത് അക്കാഡമിലേക്ക് കുട്ടികളെ നിയോഗിക്കുന്നതാണ്.

സ്പോർട്സ് അക്കാഡമിയിലേക്കുള്ള പ്രവേശനം പൂർത്തിയായ ശേഷം മാത്രമേ പഠിച്ചിരുന്ന സ്കൂളിൽ നിന്ന് ടി.സി വാങ്ങാൻ പാടുള്ളൂ. പ്രവേശനം പൂർത്തിയായ ശേഷം താമസത്തിനുള്ള കിടക്ക, ഷീറ്റ്, ഭക്ഷണം കഴിക്കുന്നതിനാളള പാത്രം, കായിക പരിശീലനത്തിനുള്ള വസ്ത്രം 1000/- രൂപ കോഷൻ ഡിപ്പോസിറ്റ് (സെൻട്രലൈസ്ഡ് സ്പോർട്സ് അക്കാഡമികൾക്ക് മാത്രം) തുടങ്ങിയവ സഹിതം അക്കാഡമിയിൽ എത്തേണ്ടതാണ്.

ജില്ല / കോളേജ് സ്പോർട്സ് അക്കാഡമിയുടെ നിയമം വളരെ കർശനമായി പാലിക്കേണ്ടതാണ്. നിയമത്തിന് വിരുദ്ധമായി പ്രവർത്തിക്കുന്നവരെ യാതൊരു മുന്നറിയിപ്പും കൂടാതെ സ്പോർട്സ് അക്കാഡമിയിൽ നിന്നും പുറത്താക്കുന്നതാണ്.

അക്കാഡമിയിലേക്ക് അഡ്മിഷൻ ലഭിക്കുമ്പോൾ 200 രൂപയുടെ മുദ്രപത്രം (കുട്ടിയുടെ രക്ഷകർത്താവിന്റെ പേരിൽ വാങ്ങിയത്) കൊണ്ടുവരേണ്ടതും കരാർ ഒപ്പിഷേണ്ടതുമാണ്. കൂടുതൽ വിവരങ്ങൾക്ക് താഴെപ്പറയുന്ന

ഫോൺ നമ്പരുമായി ബന്ധപ്പെടേണ്ടതാണ്.

സെക്രട്ടറി

യു. ഷറഫലി
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SPORTS KERALA

മെമ്മോ

സൂചന സ്പോർട്സ് അക്കാഡമിയിലേയ്ക്കുള്ള സെലക്ഷൻ സംബന്ധിച്ച്

കേരള സ്റ്റേറ്റ് സ്പോർട്സ് കൗൺസിലിന്റെ 2024-25 അദ്ധ്യയന വർഷത്തിലേയ്ക്കുള്ള സ്പോർട്സ് അക്കാഡമി സ്കീമിലേയ്ക്ക് താങ്കളെ യോഗ്യത ടെസ്റ്റിന്റെ അടിസ്ഥാനത്തിൽ തെരഞ്ഞെടുത്ത വിവരം അറിയിച്ചുകൊള്ളുന്നു. താഴെ പറയുന്ന സ്പോർട്സ് അക്കാഡമിയിലേയ്ക്കാണ് താങ്കൾക്ക് പ്രവേശനം അനുവദിച്ചിട്ടുള്ളത്.

SN · College Kannur (Football)

യോഗ്യതാ പരീക്ഷയുടെ മാർക്ക്ലിസ്റ്റും, കായിക പരിശീലനത്തിന് ആവശ്യമായ ശാരീരിക ക്ഷമതയുണ്ടെന്നു തെളിയിക്കുന്ന അസി. സർജന്റെ ഗ്രേഡിൽ കുറയാതെയുള്ള ഡോക്ടറുടെ മെഡിക്കൽ സർട്ടിഫിക്കറ്റും ഈ മെമ്മോയുമായി ഡിസ്ട്രിക്ട് സ്പോർട്സ് കൗൺസിൽ സെക്രട്ടറിയെ ബന്ധപ്പെടേണ്ടതാണ്. ജില്ലാ സ്പോർട്സ് കൗൺസിൽ അതാത് അക്കാഡമിലേക്ക് കുട്ടികളെ നിയോഗിക്കുന്നതാണ്.

താങ്കൾക്ക് അനുവദിച്ച അക്കാഡമി നിലനിൽക്കുന്ന ജില്ല സ്പോർട്സ് കൗൺസിലുമായി ബന്ധപ്പെട്ടതിനു ശേഷം മാത്രമേ പഠിച്ചിരുന്ന സ്കൂളിൽ നിന്ന് ടി.സി. വാങ്ങാൻ പാടുള്ളൂ.

Reported on 23/7/24

പ്രവേശനം പൂർത്തിയായശേഷം താമസത്തിനുള്ള കിടക്ക, ഷീറ്റ്, ഭക്ഷണം കഴിക്കുന്നതിനുള്ള പാത്രം, കായിക പരിശീലനത്തിനുള്ള വസ്ത്രം, 1000 രൂപ ക്യാഷൻ ഡിപ്പോസിറ്റ് (സെൻട്രലൈസ്ഡ് സ്പോർട്സ് അക്കാഡമികൾക്ക് മാത്രം) തുടങ്ങിയവ സഹിതം അക്കാഡമിയിൽ എത്തേണ്ടതാണ്.

Secretary
District Sports Council
Kannur

സ്കൂൾ അക്കാഡമിയിലേയും, സ്കൂളിന്റെയും സെൻട്രലൈസ്ഡ് അക്കാഡമികളുടെയും നിയമങ്ങൾ കർശനമായി പാലിക്കേണ്ടതാണ്. നിയമത്തിന് വിരുദ്ധമായി പ്രവർത്തിക്കുന്നവരെ മുന്നറിയിപ്പും കൂടാതെ അക്കാഡമി സ്കീമിൽ നിന്നും പുറത്താക്കുന്നതാണ്.

അക്കാഡമിലേയ്ക്ക് അഡ്മിഷൻ ലഭിക്കുമ്പോൾ 200 രൂപയുടെ മുദ്രപത്രം (കുട്ടിയുടെ രക്ഷകർത്താവിന്റെ പേരിൽ വാങ്ങിയത്) കൊണ്ടുവരേണ്ടതും കരാർ ഒപ്പിടേണ്ടതുമാണ്.

ജില്ല സ്പോർട്സ് കൗൺസിലുമായി ബന്ധപ്പെടേണ്ട ഫോൺ നമ്പർ ചുവടെ ചേർക്കുന്നു.

Muhammed Ameen. K
Kakkunnam House
Kakkunnam
KSSC 3665

ടെക്നിക്കൽ ഓഫീസർ

U. SHARAFALI
President
Phone: 0471-2331546, 2325883
E-mail: presidentkssc@gmail.com

M.R. RANJITH
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Phone: 0471-2331352, 2331546
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VISHNU RAJ. P IAS
Secretary
Phone: 0471-2331546
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SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

KSSC/C1/6585 /2023 07-06-2023

മെമ്മോ

സൂചന: കോളേജ് സ്പോർട്സ് അക്കാഡമിയിലേക്കുള്ള സെലക്ഷൻ സംബന്ധിച്ച്

കേരള സ്റ്റേറ്റ് സ്പോർട്സ് കൗൺസിലിന്റെ 2023-24 വർഷത്തിലേയ്ക്കുള്ള കോളേജ് സ്പോർട്സ് അക്കാഡമി സകീമിലേക്ക് താങ്കളെ യോഗ്യത ടെസ്റ്റിന്റെ അടിസ്ഥാനത്തിൽ തെരഞ്ഞെടുത്ത വിവരം അറിയിച്ചുകൊള്ളുന്നു. താഴെപറയുന്ന ജില്ല /കോളേജ് സ്പോർട്സ് അക്കാഡമിയിലേക്കാണ് താങ്കൾക്ക് പ്രവേശനം അനുവദിച്ചിട്ടുള്ളത്.

Football.	Adithyan. K.V.
	Kariyil House, Kavinisseri
	Cheruvkunnu, Kannur.
S.N. College Kannur.	670301

യോഗ്യതാ പരീക്ഷയുടെ മാർക്ക് ലിസ്റ്റും, കായിക പരിശീലനത്തിന് ആവശ്യമായ ശാരീരിക ക്ഷമതയുണ്ടെന്നു തെളിയിക്കുന്ന അസി. സർജ്ജന്റെ ഗ്രേഡിൽ കുറയാതെയുള്ള ഡോക്ടറുടെ മെഡിക്കൽ സർട്ടിഫിക്കറ്റും ഈ മെമ്മോയുമായി ജില്ല സ്പോർട്സ് കൗൺസിൽ സക്രട്ടറിയെ ബന്ധപ്പെടേണ്ടതാണ്. ജില്ലാ സ്പോർട്സ് കൗൺസിൽ അതാത് അക്കാഡമിലേക്ക് കുട്ടികളെ നിയോഗിക്കുന്നതാണ്.

സ്പോർട്സ് അക്കാഡമിയിലേക്കുള്ള പ്രവേശനം പൂർത്തിയായ ശേഷം മാത്രമേ പഠിച്ചിരുന്ന സ്കൂളിൽ നിന്ന് ടി.സി വാങ്ങാൻ പാടുള്ളൂ. പ്രവേശനം പൂർത്തിയായ ശേഷം താമസത്തിനുള്ള കിടക്ക, ഷീറ്റ്, ഭക്ഷണം കഴിക്കുന്നതിനാളള പാത്രം, കായിക പരിശീലനത്തിനുള്ള വസ്ത്രം 1000/- രൂപ കോഷൻ ഡിപ്പോസിറ്റ് (സെൻട്രലൈസ്ഡ് സ്പോർട്സ് അക്കാഡമികൾക്ക് മാത്രം) തുടങ്ങിയവ സഹിതം അക്കാഡമിയിൽ എത്തേണ്ടതാണ്.

ജില്ല / കോളേജ് സ്പോർട്സ് അക്കാഡമിയുടെ നിയമം വളരെ കർശനമായി പാലിക്കേണ്ടതാണ്. നിയമത്തിന് വിരുദ്ധമായി പ്രവർത്തിക്കുന്നവരെ യാതൊരു മുന്നറിയിപ്പും കൂടാതെ സ്പോർട്സ് അക്കാഡമിയിൽ നിന്നും പുറത്താക്കുന്നതാണ്.

അക്കാഡമിയിലേക്ക് അഡ്മിഷൻ ലഭിക്കുമ്പോൾ 200 രൂപയുടെ മുദ്രപത്രം (കുട്ടിയുടെ രക്ഷകർത്താവിന്റെ പേരിൽ വാങ്ങിയത്) കൊണ്ടുവരേണ്ടതും കരാർ ഒപ്പിഷേണ്ടതുമാണ്. കൂടുതൽ വിവരങ്ങൾക്ക് താഴെപ്പറയുന്ന ഫോൺ നമ്പരുമായി ബന്ധപ്പെടേണ്ടതാണ്.

സെക്രട്ടറി

യു. ഷറഫലി
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കേരളം केरल KERALA

EA 296729

MEMORANDUM OF UNDERSTANDING (MoU)
between
INDOCERT
and
Department of Microbiology
Sree Narayana College, Kannur

This memorandum of understanding entered into existence on 26/06/2023 between the Department of Microbiology, Sree Narayana College, Kannur (hereinafter also referred to as "the first party") and INDOCERT (hereinafter also referred to as "the second party" or "the Council").

It is hereby agreed between the parties as follows:

1. This Memorandum of Understanding ("MoU") is a non-exclusive agreement for collaboration between the first party and the second party (hereinafter also referred to as "both parties").

4707 29/5/2023 100
No. Date Rs.
Mathew Sebastian Executive Director
Indocert Thalluvayam
linked with No. from to

Remitha Mol R.
Stamp Vendor, Aluva

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

കേരളം केरल KERALA

EA 296723

2. This MoU is valid for a period of **3 (Three)** years from the date of this document, and may be extended further on mutual consent.
3. Both parties will designate a contact person from each side who will be the primary point of contact on behalf of that party, the contact details of each of whom will be provided in writing to both parties.
4. The second party agrees to provide internship opportunities to selected students from first party, enabling them to gain practical industry experience
5. The second party agrees to offer training on the areas of food safety management, organic certifications, sustainable certifications and carbon standards.
6. The training work can be undertaken at the second party premises or in the campus of first party according to the convenience of both the parties.

4701 29/5/2023 100
No.....Date.....Rs.....
Mathew sebastian Executive Partner
Indocert Thiruvananthapuram
linked with No. from.....to.....

Remitha Mol R.
Stamp Vendor, Aluva

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

7. If the MoU is terminated, steps shall be taken to ensure that the termination does not affect any prior obligations, projects or activities already in progress.
8. The various clauses of this memorandum may be amended, modified or repealed only upon mutual agreement.

Read, Understood and Consented:

In witness where of the undersigned, duly appointed representatives of Sree Narayana College, Kannur and INDOCERT respectively.

For the first party:

Signature: 260623

Name: Dr. K. P. Prasanth

Designation: Principal in Charge SN college Kannur

For the second party:

Signature:

Name: **Chris George Mathew**

Designation: **Business Development Manager, INDOCERT**

Witnesses:

1. Dr. Ayana N

2.

Witnesses:

1. Nekhil Joseph

2.

SATHEESH CHERIYAP
I attest to the accuracy
this document
Principal, Sree Narayan
21.10.2024 16:00

भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

रु. 100

ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

DT 397118

കേരളം केरल KERALA

Memorandum of Understanding between

Department of Botany, Nehru Arts and Science College Kanhangad,

And

Department of Botany, Sree Narayana College Kannur

The Memorandum of Understanding is made on 27th March 2023 between Department of Botany, Nehru Arts and Science College Kanhangad and Department of Botany, Sree Narayana College Kannur. The general objective of this agreement is to establish an academic collaboration between the Department of Botany, Nehru Arts and Science College Kanhangad – 671314 and the Department of Botany, Sree Narayana College Kannur – 670007. This academic collaboration is to stimulate and facilitate the development of collaborative and mutually beneficial programs which will serve to enhance the intellectual life and cultural developments in students.

27/3/23

PRINCIPAL
SREE NARAYANA COLLEGE
KANNUR

144925 ... Principal, S N College Kannur

24-3-23 ... 100

27/3/23

PRINCIPAL
NEHRU ARTS & SCIENCE COLLEGE
KANHANGAD

DISTRICT TREASURY KANNUR
24 MAR 2023

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Subject to mutual consent, the areas of collaboration will include any programme offered at either institution as thought desirable and feasible on either side and that both sides will contribute to the fostering and development of the collaborative relationship between the Botany departments of two colleges. Collaboration shall be carried out through the activities such as:

1) Faculty exchange programmes, student exchange and seminars can be conducted by both the institutions in collaboration.

2) Exchange of academic materials and other information.

3) Sharing of resources for inculcating a research culture for degree students.

This agreement will take effect from the date of its signing and will be valid only for three years.

The designated liaison officers for this Memorandum of Understanding are

1. Mr./Smt. Dr. Subrahmanya Prasad. K, Assistant Professor, Dept. of Botany, Nehru Arts and Science College Kanhangad.

2. Mr./Smt. Dr. K. P. Prasanth....., Assistant Professor, Dept. of Botany, Sree Narayana College Kannur.

In witness whereof the said first party and the second party have put their signatures, here under the day, monrh and year first above written.

Signature of the first party

PRINCIPAL
NEHRU ARTS & SCIENCE COLLEGE

NEHRU ARTS & SCIENCE COLLEGE P.O. Padnekad Kasaragod Dt. KANHANGAD

Signature of the second party

27/3/23

PRINCIPAL
SREE NARAYANA COLLEGE
KANNUR

In the presence of the following witnesses

1. Dr. Agretious Thomas
NAS College Kanhangad

2. Dr. Aparna P
SN College, Kannur.

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

भारतीय गैर न्यायिक

भारत

पचास रुपये रु.50

FIFTY RUPEES Rs.50

सत्यमेव जयते

INDIA

INDIA NON JUDICIAL

കേരളം केरल KERALA CP 346161

Memorandum of Understanding between

PG Department of Mathematics, Sree Narayana College, Kannur

and

Department of Mathematics, S.E.S College, Sreekandapuram,

The Memorandum of Understanding is made on ......10/01/2024........ between PG Department of Mathematics, Sree Narayana College, Kannur and Department of Mathematics, S.E.S College, Sreekandapuram. The general objective of this agreement is to establish an academic collaboration between the PG Department of Mathematics, Sree Narayana College, Kannur, Thottada -670007 and Department of Mathematics, S.E.S College, Sreekandapuram, 670631. This academic collaboration is to stimulate and facilitate the development of collaborative and mutually beneficial programs which will serve to enhance the intellectual life and cultural developments in students.

നമ്പർ 119406 പേര് Jency John
ദേശം Edakkad
തീയതി 10-1-24 രൂ 50
കണ്ണൂർ താലൂക്ക് ആഫീസ് ...
വെണ്ടർ കെ. പി. ജഗദീഷ്

STAMP DEPOT * DISTRICT TREASURY KANNUR *
08 JAN 2024

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

കേരളം केरल KERALA CP 346162

Subject to mutual consent, the areas of collaboration will include any programme offered at either institution as thought desirable and feasible on either side and that both sides will contribute to the fostering and development of the collaborative relationship between the mathematics departments of two colleges. Collaboration shall be carried out through the activities such as:

1) Faculty exchange programmes, student exchange and seminars can be conducted by both the institutions in collaboration.
2) Exchange of academic materials and other information
3) Team taught courses, including online certificate courses
4) Sharing of resources for inculcating a research culture for degree students.

This agreement will take effect from the date of its signing and will be valid only for one year.

STAMP DEPOT DISTT. TREASURY KANNUR 08 JAN 2024

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document.
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

നമ്പർ 119407 പേര് Jency John
മേൽവിലാസം Edakkad
തീയതി 10/1/24 രൂ 5.0
കണ്ണൂർ താലൂക്ക് ആഫീസ് അക്കൗണ്ടന്റ്
വെണ്ടർ കെ. പി. ജഗദീഷ്

The designated liaison officers for this Memorandum of Understanding are

1. Mr./Smt. ..Jency John....., Assistant Professor, PG Department of Mathematics, Sree Narayana College, Kannur.
2. ~~Mr.~~/Smt. .Rasina M.P....., Assistant Professor, Department of Mathematics, S.E.S College, Sreekandapuram.

IN WITNESS WHEREOF the said first party and the second party have put their respective signatures, here under the day, month and year first above written.

10/01/2024

Signature of the first party

Rasina 10/01/2024

Signature of the second party

In the presence of the following witnesses

1. Divya. P.M, Assistant Professor, S.N. College Kannur

2. Silja. C, Assistant professor, SES College, Sreekandapuram

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

CERTIFICATE OF COLLABORATION

This is to certify that the **Dr. Jithesh K**, Assistant Professor, Department of Chemistry, Sree Narayana College Kannur is actively collaborating with Dr. Govind Raj, Assistant Professor Department of Chemistry, Malabar Christian College Kozhikode in various academic and research activities for the academic year 2023-2024.

1. Co-supervising post-graduate and research students
2. Knowledge sharing though faculty exchange
3. Undertaking research projects
4. Publication Research papers in International Journals

Dr. GOVIND RAJ K.
Assistant Professor
Department of Chemistry
Malabar Christian College
Calicut - 673001

Dr. Govind Raj,

Assistant Professor Department of Chemistry,

Malabar Christian College Kozhikode

01-06-2023

DEPARTMENT OF CHEMISTRY MALABAR CHRISTIAN COLLEGE CALICUT

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

Next Materials 4 (2024) 100199

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Research article

Synthesis and characterization of alpha and beta cobalt hydroxide nanostructures for photocatalytic dye degradation and supercapacitor applications

Roshni C P [a], Jithesh K [b], Anjana P M [c], Govind Raj K [a,*], Rakhi R B [c,*]

[a] Department of Chemistry, Malabar Christian College, Calicut, Kerala 673001, India
[b] Department of Chemistry, Sree Narayana College, Kannur, Kerala 670007, India
[c] Materials Science and Technology Division, CSIR-National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram, Kerala 695019, India

ARTICLE INFO

Keywords:
Alpha
Beta
Cobalt hydroxide
Dye degradation
Photocatalysis
Supercapacitor

ABSTRACT

Alpha and beta cobalt hydroxide nanostructures were synthesized by hydrothermal method and characterized using X-ray diffraction and electron microscopy. The turbostatic alpha-$Co(OH)_2$ has large interlayer spacing compared to the beta-$Co(OH)_2$ and is less explored in the literature. Both nanostructures were efficient in degrading methylene blue dye in the presence of visible light. Under identical conditions, the rate constant of photocatalytic dye degradation in the presence of alpha and beta cobalt hydroxide was calculated as 60.22×10^{-3} min^{-1} and 19.05×10^{-3} min^{-1}, respectively, which is highest when compared to the previous reports. The superior activity of alpha-$Co(OH)_2$ when compared to beta-$Co(OH)_2$ is also demonstrated in this work. Additionally, a Csp value of 137 F/g and 2.4 F/g, respectively, at a current density of 1 A/g, was obtained from the GCD analysis of devices made using alpha-$Co(OH)_2$ and beta-$Co(OH)_2$. A higher cyclic stability and power density were observed for alpha-$Co(OH)_2$ when compared to beta-$Co(OH)_2$. The findings suggest that alpha and beta cobalt hydroxide nanostructures hold promise as effective catalysts for dye degradation and potential materials for high-performance supercapacitors. Further investigations into the unique properties of the relatively superior alpha-$Co(OH)_2$ could lead to advancements in environmental remediation and energy storage technologies.

1. Introduction

In recent years, treating industrial wastewater contaminated with hazardous organic dyes has become a critical environmental issue [1]. These dyes, commonly found in industries such as paper, textiles, and food processing, are characterized by complex aromatic structures that make them highly stable and resistant to degradation. As a result, water bodies are increasingly contaminated, leading to a decline in water quality, which poses a significant health risk [1]. To tackle this issue, researchers have been actively exploring advanced oxidation processes (AOPs) as effective methods for wastewater treatment [2]. AOPs encompass various techniques, including ozonation, sonolysis, Fenton reaction, and photocatalysis, which can be employed individually or in combination. These processes offer advantages such as high efficiency, simplicity, good reproducibility, and easy implementation. By generating strong oxidizing radicals, notably hydroxyl radicals (OH), AOPs initiate chain reactions that break down dye molecules into smaller, less harmful species. Among these methods, photocatalysis has emerged as a promising alternative to traditional biological treatments [3].

Among the various organic contaminants, methylene blue holds particular significance as a widely used cationic dye in industries like textiles and paper manufacturing [4]. Methylene blue, also known as 3, 7-bis(dimethylamino)phenothiazin-5-ium chloride finds applications in therapeutic and diagnostic procedures in both human and veterinary medicine [4]. While methylene blue is considered non-toxic, its exposure to sunlight can generate hazardous oxygen singlets, posing risks to living organisms and aquatic environments and raising concerns for public health. Consequently, researchers have explored different catalysts for the degradation of methylene blue, including CuO, TiO_2, $FeTiO_3$, and Cu-Ti composites [1–4]. This study focuses on the unique application of alpha and beta cobalt hydroxide for the degradation of methylene blue.

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Available online 16 April 2024

SREE NARAYANA COLLEGE KANNUR P. O. THOTTADA 670007
(AFFILIATED TO KANNUR UNIVERSITY)
NAAC Re accredited with A grade. (CGPA: 3.04)

Dr. Satheesh. C. P
Principal in charge

Email: sncollegekannur@gmail.com
Ph:04972731085

Dated: 03.02.2024

COLLABORATION AGREEMENT

between

Department Of Hindi , Sree Narayana College,Kannur

and

Department of Hindi, Payyannur College, Payyannur

Collaboration agreement entered on11/11/2022 between the Department of Hindi, Sree Narayana College, Kannur and the Department of Hindi, Payyannur College, Payyanur

Objective of Collaboration and Activities Focused

Hindi, being a pan Indian language, needs to be promoted regionally and needs to be promoted nationally too. The main objective of this collaboration is the promotion of Hindi language and Literature both nationally and regionally. With this aim, the collaboration intends to organize exchange programmes regarding Hindi language and literature, and to perform various academic activities like translation, linguistic orientation programmes etc.

Benefits of Collaboration

Payyannur College, Payyannur, is a NAAC AT B+ Level Accredited College. Department of Hindi, Payyannur College, Payyanur is well known for its excellence. The Hindi Department is a model for other institutions in assimilating the contemporaneity of knowledge. Department of Hindi, Sree Narayana College, Kannur is involved in mutual co-operation with Payyanur College. This collaboration envisages a long-term programme to engage in large-scale local research work and comprehensive investigation of Hindi heritage and nationalism.

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

This agreement of collaboration is valid for 2 years from the date signed by the two parties.

Head of the Department
Department of Hindi
Payyannur College
Payyannur, Edat PO,
Kerala -670327

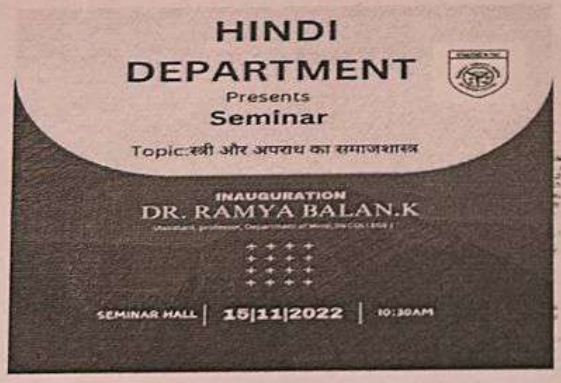
DR. SINDHU A.
Assistant Professor & HOD
Dept. of Hindi
Payyanur College, Payyanur
Edat P.O., Kannur - 670 327

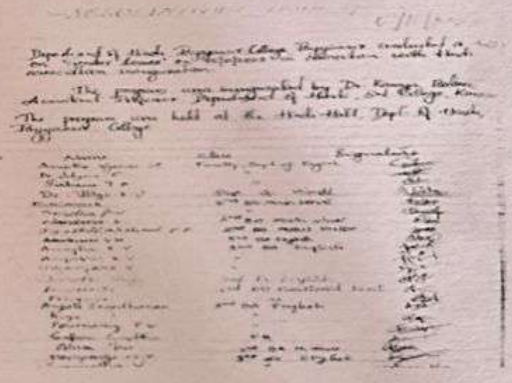
Head of the Department
Department of Hindi
Sree Narayana College
Thottada PO, Kannur,
Kerala – 670007

Dr. RAMYA BALAN
H.O.D.
HINDI DEPARTMENT
SREE NARAYANA COLLE

Activity on Collaboration

Department of Hindi, Payyanur College, in association with Department of Hindi, Sree Narayana College, Thottada, Kannur organized a talk on the topic gender issues titled "STREE AUR APARAD KA SAMAJSASTRA" on 15/11/2022, at Hindi Hall, Payyanur College. Dr Ramya Balan K, Asst. Professor, Department of Hindi, Sree Narayana College was the resource person. Dr. Surekha T V delivered the welcome speech, Dr. Sindhu A presided the session and introduced the speaker. Dr. N M Sreekanth delivered the vote of thanks. The students were very active during the session and interacted well with the resource person.





SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

കേരളം केरल KERALA EC 846693

MEMORANDUMOFUNDERSTANDING(MOU)
BETWEEN
ACADEMYFORPROFESSIONALSTUDIES(APS)

And
DEPARTMENT OF MANAGEMENT STUDIES
SREENARAYANACOLLEGE,THOTTADA-KANNUR

MEMORANDUMOFUNDERSTANDING

This Memorandum of Understanding (herein after called as the 'MOU')is entered into on this the

25TH day of JULY 2023 by and between **ACADEMY FOR PROFESSIONAL STUDIES, THE FIRST PARTY** represented herein by its Director Mr. **SHABEER ALI P P** AND **THE SECOND PARTY** represented herein by Ms. **SAMINA SATHYANATH,HOD OF DEPARTMENT OF MANAGEMENT STUDIES, SREENARAYANA COLLEGE, THOTTADA- KANNUR**

04/08/23

SHABEER ALI P P
FIRST PART

SAMINA SATHYANATH
SECOND PARTY

SAMINA SATHYANATH
Assistant Professor & Head
Department of Management Studies
Sree Narayana College,
Thottada, Kannur-670007

...38126... പേര് DIRECTOR, APS
...Kannur...
...20-7-23... ക ...100...
നൂർ താലൂക്ക് ആഫീസ് ആ.
ണർ കെ. പി. ജഗദീഷ്

14 JUL 2

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

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भारत INDIA

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EC 846694

കേരളം केरल KERALA

PURPOSEOF MOU

In particular, this MOU is in tended to

1. Organize various workshops and seminars on Professional financial Career.
3. Conduct practical trainings on Financial Accounting.
4. Organize various workshops and seminars on Skill Development for students.

NOW THEREFORE, INCONSIDERATIONOFTHEMUTUALPROMISESSETFORTH INTHIS MOU, THE PARTIES HERETO AGREE AS FOLLOWS:

Clause1

CO-OPERATION

1.1 Both parties are united by common interests and objectives, and they shall establish channelsof communication and co-operation that willpromoteand advancetheir respectiveoperations. Theparties shallkeep eachother informed of potentialopportunities and shareallinformation that may be relevant to secure additional opportunities for one another.

04/08/23

SHABEER ALI P P
FIRST PART

SAMINA SATHYANATH
SECOND PARTY

SAMINA SATHYANATH
Assistant Professor & Head
Department of Management Studies
Sree Narayana College
Thottada, Kannur-670007

DISTRICT ... KANN... 14 JUL

..ുമ്പർ 38127 പേര് DIRECTOR, APS
..ദേശം Kannur
..തീയതി 20-7-23 ക 100
..ണ്ണൂർ താലൂക്ക് ആഫീസ് ആ.
..വണ്ടർ കെ. പി. ജഗദീഷ്

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00

1.2 The co-operation between First Party and Second Party will facilitate effective utilization of the intellectual capabilities of the First Party providing significant inputs to them in developing suitable teaching/ training systems, keeping in mind the needs of the Second Party.

1.3 Second party is not allowed to enter an alliance with any other party providing the same services as long as the second party has an MOU with the first party.

Clause 2
SCOPEOFTHEMO
U

2.1 Both parties believe that close co-operation between the two would be a major benefit to the student community to enhance their skills and knowledge.

2.2 The First Party will give valuable inputs to the Second Party inteaching/training methodology so that the students fit into the scenario meaningfully.

2.3 The First Party will train the students of the second Party on the professional finance career in order to bridge the gap in skill and make them ready for better finance career.

2.4 The First Party will extend the necessary support to deliver special classes to the students of the Second Party on the finance related topics.

Clause 3 VALIDITY

3.1 The validity of the agreement is one year from the date of agreement.

3.2 Both Parties may terminate this MOU upon 30 calendar days' notice in writing. In the event of Termination, both parties have to discharge their obligations.

04/08/23

SHABEER ALI P P
FIRST PART

SAMINA SATHYANATH
SECOND PARTY

SAMINA SATHYANATH
Assistant Professor & Head
Department of Management Studies
Sree Narayana College,
Thottada, Kannur 670007

1. Dr. K-P. Prasanth
IQAC Coordinator
SN College Kannur
040823

2. Sumesh P.C
Asst Professor
Dept of Management Studies
S.N.C.
04/08/2023.

SATHEESH CHERIYAPUTHALATH
I attest to the accuracy and authenticity of this document
Principal, Sree Narayana College, Kannur
21.10.2024 16:00