University of Colombo | Celebrating 100 years of excellence in Science (1921 - 2021)

chem@UoC

"Diligence leads to Excellence"

ISSUE 01 - JANUARY 2021

"Department of Chemistry is one of the highest functioning, prestigious, and internationally recognized subunits of the Faculty of Science, University of Colombo. Each year, through carefully administrated undergraduate and postgraduate programs leading to BSc, BSc (Hons), MSc, MPhil, and Ph.D., a set of skilled young scientists are gifted to the world from our department. The degrees are offered in the fields of Chemistry, Computational Chemistry, Pharmacy, Biochemistry & Molecular Biology, and Biotechnology under the guidance of an unparalleled academic staff supported by selfless non-academics.

Research is one of the key attributes in our culture. The department currently serves the industry and other institutions through the centers; CARD, SLPL, BTechS, and CAMD established within the department."

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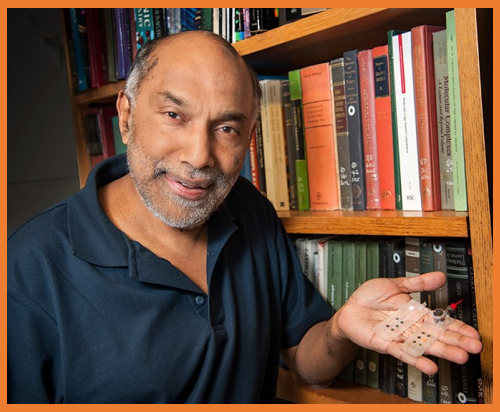
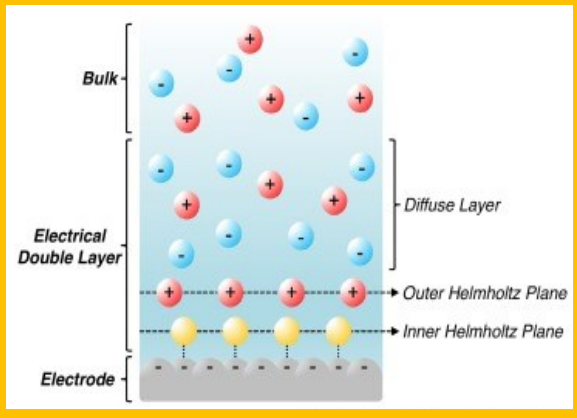
Chemistry celebrates 100 years!

Two Legendary Chemists produced by the Department of Chemistry: Professor A. Prasanna de Silva and Dr. M. A. V. Devanathan

Amilra Prasanna de Silva's learning and teaching experiences occurred at the University of Colombo, Sri Lanka and at Queen's University Belfast, Northern Ireland. He obtained a BSc Honors Degree in Chemistry from the University of Colombo in 1976 and obtained his Ph.D. from the Queen's University Belfast in 1980. He also became a postdoctoral researcher at the same University in 1980. He returned to Sri Lanka in 1980 and worked as a Lecturer at the University of Colombo for 6 years. He accepted a Lecturer position at the Queen's University Belfast in 1986 and since then he has held positions such as Reader and Professor. With his co-workers, he introduced molecular logic as an experimental field and established the generality of the luminescent PET (photoinduced electron transfer) sensor/ switch principle. He invented the market-leading point-of-care blood gas/ electrolyte analyzer along with Roche scientists and engineers, which has sales of 150 M USD for human use (OPTI™) and 400 M USD for veterinary use (Vetstat™) so far. This work was also presented to the British Parliament in 2015 as part of a national campaign run by the Royal Society of Chemistry and Institute of Physics. He wrote the book 'Molecular Logic-based Computation' in 2013, which is also available in Chinese and in Japanese since 2014. Presently he is the Chair Professor at the School of Chemistry and Chemical Engineering, Queen's University Belfast, UK. He won the Royal Society of Chemistry Sensors award in 2008 and the first international award for Molecular Sensors and Molecular Logic Gates in 2012. He was elected to the Royal Irish Academy in 2002 and also a Fellow of the Royal Society of Chemistry (FRSC). His present h-index is 65 with 20,000 citations. Professor A. P. de Silva was named as the latest (2020) recipient of the Boyle Higgins Gold Medal, awarded by the Institute of Chemistry of Ireland in recognition of his outstanding and ongoing contributions to Chemistry.



Michael Angelo Vincent Devanathan, the leading figure of Physical Chemistry in Sri Lanka is one of the greatest and internationally renowned chemists produced by the University of Ceylon in 1947. He obtained his Ph.D. from the Imperial College, UK. His name is associated with the Double Layer Theory in Electrochemistry. In 1963, J. O. M. Bockris, M. A. V. Devanathan and Klaus Mullen proposed the BDM model of the double layer. He was able to publish some of his work in the Journal Nature. He worked at Southampton, Pennsylvania, Karaikudi in India and also at the Tea Research Institute, Ceylon. He taught at the University of Colombo as a visiting Professor and was considered as a real master in his field. From around 1972 until his death, Dr. Devanathan worked as the Director of the Tea Research Institute of Ceylon.



Double Layer Theory in Electrochemistry

CONGRATULATIONS

FOR BEING APPOINTED AS THE HEAD OF THE DEPARTMENT

Professor K. M. Nalin de Silva

What stream did you choose for A/Ls?

Physical Sciences

Why did you choose Chemistry?

My "Passion"

What was your experience as an undergraduate at UoC?

Simply fascinating! It was meant for 4 years, but stayed 7 years due to the turbulent political situation in the country. I was the Chemistry batch top in all four years and also participated in six sports including Tennis, Table Tennis and Cricket. I was awarded university colors for both Tennis and Table Tennis for all four years and captained both sports. Among many awards the notable awards are Bhikaji Framji Khan Gold medal for Chemistry and also Justin Samarasekera Award which is given to the most outstanding Science student of the year. I met Rohini, my wife, during my second year.

Where did you pursue your Ph.D.?

University of Cambridge, UK.

What was your Ph.D. experience like?

I completed my Ph.D. in three years. I worked in the area of Laser Induced Fluorescence coupled with Flash Photolysis. Cambridge was very famous for Flash Photolysis at that time since the Nobel Prize for Flash Photolysis was awarded to Professor R. G. W. Norrish and Professor George Porter. My supervisor was a student of Professor Norrish at Cambridge and I was fortunate to work in the same lab where Norrish had worked. I also played Table Tennis for Cambridge Blue team (First Team) and also played Cricket for a Cambridge County Club, Madingley Cricket Club and also captained the Department of Chemistry Cricket team in Cambridge.

Any specific reason to select UoC for your academic career?

I had the inclination to become an academic, however, I was offered a Management Trainee position at Unilevers just after the graduation. I accepted the position mainly due to the financial benefit but worked only one day and returned to the university as a Probationary Lecturer. UoC is my second home and never wanted to leave.

What made you choose Nanotechnology?

My initial field of research was not nanotechnology. We started our postdoctoral work in Louisiana, USA in 2005 and I worked on organic materials. Rohini involved me in nanotechnology as she worked at the Centre for Advanced Microstructures and Devices (CAMD) in USA. Back then nanotechnology was new to the world, and now it is a cutting-edge technology that is applied in many fields.

Your favorite research in Nanotechnology?

I am passionate about water purification techniques and drug delivery methods using nanotechnology because I am keen to contribute to the community through my research.

Your experience at SLINTEC?

I worked at SLINTEC from 2012 to 2019 as the Science Team Leader. During these 7 years, I was involved in many research projects and published nearly 50 international research papers and four US patents. My materials research group generated around $ 400,000 through patent sales.

Why should students choose Chemistry? What are the career opportunities in this field?

It all depends on the person. If you are passionate you can make wonders with Chemistry. Chemists can fit into any career.

Your expectations for the department's future?

I am fortunate to lead a set of excellent academics in the department. I desire to develop a research culture and make this department a "Brand" for Chemistry in this country. Furthermore, I am working on improving the academic program and also the infrastructure of the department.

What are the drawbacks you see in this younger generation?

They are much advanced in using technology, but are poor in resilience, socio-emotional skills and fitness. Their interaction with people is lesser than us.

"TAKE-HOME MESSAGE"

Our greatest weakness lies in giving up challenges. The best way to succeed is to demonstrate resilience through dedication and commitment. Diligence leads to Excellence.

By Lakshan Yamudith, Gayathri Yogaganeshan, Sanjani Adikari

Newly appointed JUNIOR ACADEMIC STAFF

From left to right (First row): Dinushika Wijayasiri, Divyasorubini Seerpatham, Gayathri Yogaganeshan, Sanjani Adikari, Dinelka Amarasekara, Danushki Suriyawansa, Sahani Iddawela, Salini Yapa, Rashini Gamage, Dimuthu Thanippuli Arachchi, Udani Gamage, Sachini Bamunuarachchi, Uthpala Ekanayaka, Panchali Ranasinghe, Yashodha Kahandawaarachchi, Jeyatharshika Antonyrajah, Chamilka Ratnayake.

From left to right (Second row): Dulitha Kulathunga, Gayan Kanchana, Rangana De Silva, Kamindu Gayashan, Senal Liyanage, Lakshan Yamudith, Gihan Perera, Charitha Rajapakse, Nipuna de Zoysa, Kaushalya Perera, Kasun Abeyrathne, Sharada Kothalawala, Darshana Sampath.

Inauguration of Chemistry MSc programs for 2020

The inauguration ceremony of the MSc programs was held on the 28th of August 2020 at the Chemistry Lecture Theatre (CLT) at the Department of Chemistry. These programs enrich students with in-depth theoretical knowledge and practical competencies in related Chemistry principles and applications.

CHEMSOC – Chemical Society

The Chemical Society ('ChemSoc') established under the Department of Chemistry is one of the largest, oldest, and most active student societies of the University of Colombo.

ChemSoc provides opportunities for the students of the Faculty of Science to excel in their scientific journey by bringing out their hidden skills, assisting in planning for higher studies, and training them for future careers. The society organizes many events throughout the year both concerning the subject and various community service projects.

Inter-School Chemistry quiz competition, Scholarly Access in Helping the Advancement of Science (SAHAS) annual community service project, Chemistry magic shows, food festival, and guest lectures are some of the events. This year ChemSoc has taken the initiation in providing lab coats to undergraduates and postgraduates towards maintaining laboratory safety.

The motivational spirit behind ChemSoc is Dr. Hasini Perera (Senior Treasurer).

Senior Professor Srianthie A. Deraniyagala, Senior Professor Ramanee Wijesekera, and Professor W. Rohini M. de Silva were honored for their 40, 35, and 25 years of long service respectively to the University of Colombo on 06th February 2020 (completed in April 2019), awarded by the Vice-Chancellor, Senior Professor Chandrika N. Wijeyaratne. On behalf of the Department of Chemistry, it is with great pride and admiration that we congratulate our three dearest Professors on this service anniversary milestone.

LONG SERVICE AWARDS CEREMONY - 2019

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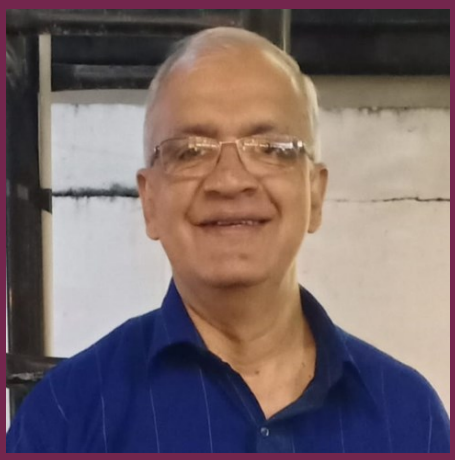
LONG SERVICE AWARDS CEREMONY - 2019

We warmly welcome Dr. Tharindunee Jayakody to the Department of Chemistry as a Lecturer in Molecular Biology and Biochemistry. She is a proud product of the department who gained her Ph.D. from the National University of Singapore. Congratulations and we wish you all the best!

ACADEMIC SUPPORT STAFF

Our beloved

PROFESSOR CHANDRASEKHARAN



Professor N. V. Chandrasekharan, who is well known among everyone as Charky sir is an outstanding Scientist at the University of Colombo. Charky sir received his BSc degree from the University of Colombo in 1981 and completed his post-graduate degree from the same institution in 1996. Soon after completing his postdoc, Charky sir entered into the academic staff of the Faculty of Medicine, University of Colombo as a Senior Lecturer in Biochemistry. Charky sir attended Brigham Young University, Provo, Utah in the year 2000 as a Postdoctoral research fellow. Since 2006, he has been working as a Senior Lecturer in Biochemistry and Molecular Biology at the Department of Chemistry, University of Colombo. His research interests focus on Molecular Biology and Biotechnology and current projects include “Development of DNA based detection methods” and “Molecular pharmacological focuses on studying the biochemistry and pharmacology of cyclo-oxygenase and its variants”. Charky sir was recently promoted as a Professor in Biochemistry and Molecular Biology. Dear teacher, the entire department is happy and proud to hear about the news of your promotion and the impact you have wielded on us is worth celebrating. Congratulations sir!

By Senal Liyanage, special thanks to Ms. Nirosha Panchananthan, Biotechnology Laboratory

Congratulations to Ms. Dimuthu Hasanthi Thanippuli Arachchi for securing first place at the Inter-University Undergraduate Thesis Competition 2020, out of nine state universities and other higher educational institutes across the country, which was organized by SLAAS. Her research, “Development of a selective fluorescence sensor based on 5 chloro-1,10-phenanthroline for the determination of iron(II)” was carried out under the supervision of Professor M. D. P. De Costa and Dr. R. Senthilnithy.

Team UoC shines at SLAAS quiz and poster competition

Inter-University quiz and poster competition 2020, conducted by Sri Lanka Association for the Advancement of Science (SLAAS) – under section E2 was held on 19th of September 2020, at SLAAS premises. Team UoC emerged victorious after a tough battle with other university participants.

Besides, the University of Colombo was awarded first place in the poster competition under the themes, ‘Value Addition to Natural Resources in Sri Lanka’ and ‘Green Energy’ and second place under the poster theme, ‘Bioweapons’. Our heartiest congratulations to all the winners!

From left to right (First row): Divyasorubini Seerpatham, Danushki Suriyawansa, Kaushalya Perera, Gihan Perera, Dr. Gayathri Silva, Dr, Aashani Tillekaratne, Dr. Ireshika de Silva, Charitha Rajapakse, Nipuna de Zoysa, Dimuthu Thanippuli Arachchi, Sahani Iddawela.

From left to right (Second row): Poster - D. G. A. I. Karunarathna, T. V. G. Lirushie, R. Ashweni, P. G. Sandali Lakmini, P. N. J. S. N. De Silva, L. R. Jayalath, M. I. T. Peiris, Quiz team - T. D. K. Udawattage, N. G. A. A. Lakmal, P. L. Y. V. Alwis, M. V. J. T. Mawela, Poster - K. P. A. M. Sandaruwan, K. K. Thushan Thilanka, K. N. I. Kodippili, S. Ganeshiny, D. N. Owitipana, L. W. D. D. V. Lokuwalpola.

By Salini Yapa

Seerpatham Divyasorubini (Assistant Lecturer, Department of Chemistry) received the “Best Poster” award (Life Sciences, Group A-Undergraduate/ Master's or equivalent) at the International Poster Presentation Competition (IPPC) - 2020 for the poster titled “Fluoride enhances the antibacterial activity of carrier ionophore antibiotics”. The poster competition was held in October 2020 and was organized by NYAB, INYAS, SLAYS, and TYSA. Students from four countries (Thailand, Sri Lanka, India, and Bangladesh) had participated with outstanding posters presenting their research work. The poster was based on her final year undergraduate research work, supervised by Dr. Gayathri N. Silva.

Dr. H. Ireshika De Silva received the “Best Poster” award under the Green Chemistry & Catalysis theme at the Commonwealth Chemistry Posters - Partnership for the Goals' Virtual poster competition for the poster titled "Banana leaf mediated green synthesized palladium nanoparticles as effective catalysts for the Suzuki-Miyaura cross-coupling reactions under aerobic and ligand-free conditions". Research work was conducted by two undergraduate students, Ms. Ashwini Dantanarayana and Ms. Yashoda Kahandawalaarachchi at the Department of Chemistry under Dr. De Silva's supervision. This event was conducted by the Commonwealth Chemistry, Federation of Chemical Sciences Societies from 25th to 27th August 2020.

Interviewing Activities

Students at the Department of Chemistry had the opportunity to have a chat/ discussion in October 2020 with Professor Robert Grubbs who won the Nobel Prize in Chemistry in 2005 for his work on metathesis reactions. They spent an amazing time with the Nobel laureate discussing topics related to his humble upbringing, the cutting-edge research he has done, and many other aspects related to a life of a scientist.

Also, "Interviewing Eminent Scientists" is a novel initiative started under the Department of Chemistry AHEAD ELTA-ELSE grant coordinated by Dr. Neranga Abeyasinghe. Under this activity students have interviewed Professor Harry Gray at Caltech, Professor David Beratan at Duke University, Professor Chris Cramer, Vice President for Research at the University of Minnesota, Professor Judith Klinman at the University of California at Berkeley and Professor Laura Gagliardi at the University of Chicago. Their early inspiration to become scientists, their ground breaking research work and many other interesting aspects were discussed under this activity. There are many interesting interviews that will be highlighted in the upcoming issues of our Newsletter. The interviews under this activity will be uploaded to the Department's official YouTube channel "CMB Chemistry" (https://www.youtube.com/channel/UCkaTHZBPgr2_vkLbvnBDEHA) and will be accessible to the public.

In both of the above activities Dr. Neranga envisioned the development of socio-emotional skills of students/ viewers such as self-confidence, communication skills, critical thinking skills and time management which are essential for the development of an individual's future success as a productive human being with empathy. Watch out this space for more interesting interviews of eminent scientists.

Undergraduate Research Publications

Amino and chloro derivatives of 1,10-phenanthroline as turn-off fluorescence sensors for selective and sensitive detection of Fe(II)

D. H. Thanippuli Arachchi, G. I. P. Wijesekera, M. D. P. De Costa, R. Senthilnithy

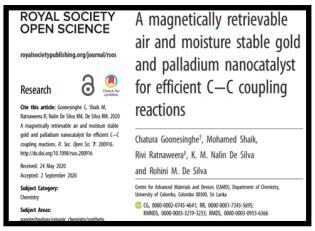
Publication

Journal of Photochemistry and Photobiology A: Chemistry Volume 402, 1 November 2020
https://doi.org/10.1016/j.jphotochem.2020.112805

The research was focused on developing a turn-off fluorescence sensor to selectively analyze Fe (II). The developed probe is based on 5-chloro-1,10-phenanthroline.

A Magnetically Retrievable Air and Moisture Stable Gold and Palladium Nano catalyst for Efficient C-C Coupling Reactions

Chatura Goonesinghe, Mohamed Shaik, Rivi Ratnaweera, K. M. Nalin de Silva, Rohini M. de Silva



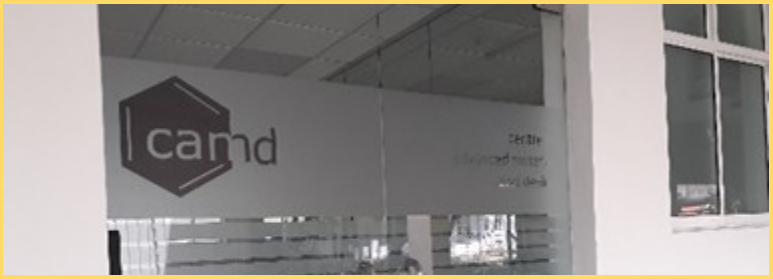
Publication

Royal Society Open Science: Volume 07, Issue 09, 30 September 2020
https://doi.org/10.1098/rsos.200916

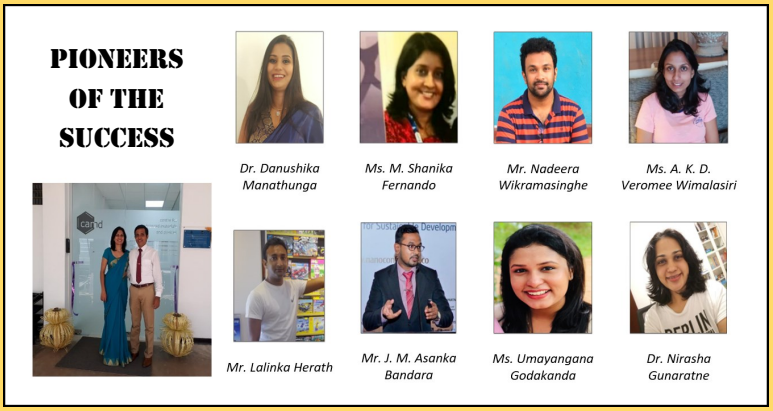
The study reports the synthesis of a highly stable, magnetically retrievable gold and palladium nano catalyst (AuPd@AMNPs), highly active in Suzuki cross-coupling and related homocoupling reactions. Through these reactions it is shown that AuPd@AMNPs can be used as a stable and recyclable palladium reservoir for multiple palladium-catalyzed reactions.

CAMD

Centre for Advanced Materials and Devices



CAMD is a materials science research center with state-of-the-art facilities in the Department of Chemistry. CAMD is capable of providing facilities to research students in the Department of Chemistry and also consultancy services utilizing world-class scientific practices and expertise in various areas related to advanced materials and nanotechnology. CAMD is equipped with sophisticated equipment such as X-ray Diffractometer (XRD) and Microwave Plasma Atomic Emission Spectrometer (MPAES). CAMD also facilitates critical support to the industry in order to achieve their research and development targets. CAMD research team (headed by Professor Rohini M. de Silva and Professor K. M. Nalin de Silva) is mainly involved with developing novel materials and technologies related to water purification, drug delivery, textile and apparel, rubber composites, and natural resources. CAMD was established in 2018 through a Target Oriented research grant (Rs. 50 Million) from the National Research Council and a matching grant of Rs. 12 Million from the University of Colombo. Professor Dhammike Dissanayake, Professor Ranil Dassanayake and Professor Gareth Williams (University College London, UK) are the other academics involved with the Target Oriented Research Project.



CHIT-CHAT

"Actually, my main advice is to explore beyond what the information tells you. The second advice is, to be honest with yourself (even if you are not honest with others). Finally, do not assume that you are the last human being to survive on this planet. Especially for students, I would like to say, if you work hard and smart with empathy, amazing things will happen!"

Neranga I. Abeyasinghe (Ph.D., U of M, Ann Arbor), Senior Lecturer, Department of Chemistry, University of Colombo.

"I was born in Colombo. My mother was a Science teacher, while my father was a teacher in Mathematics. I have an elder sister who is an architect and a younger sister who has a Ph.D. in Brain Biophysics. I remember being really curious about how nature worked so smoothly and about the person in the mirror when I peeped into it. I always had a yearning to find out more about them. I studied at Royal College, Colombo 7. My interest in Science grew even stronger influenced by my parents' careers. I really admire 'fearlessness of failure' which is a vital trait to deal with hard problems, research, and innovations." he continued.

He chose the Science Faculty over Med-School!

"Yes, I had A's for all the subjects; Chemistry, Physics, and Biology, and I was the 41st from the island and 23rd from the Colombo district. However, before I did my A/Ls I explored where I should end up. Since I was quite fond of Science, I wanted to get my hands on real research that can make an impact on the world, especially because I did not see high-impact research and innovation in Sri Lanka. By that time, I realized if I got into medical school, I might narrow down my scope and opportunities. Hence, I chose Chemistry as I felt it to be the central hub that connects all Sciences. I earned my Ph.D. from the University of Michigan (ranked best public university in the US) working at the intersection of Chemistry, Physics, Engineering, and Materials Science. I joined a research group that used ultrafast spectroscopy to investigate the dynamics of materials, such as ones that can be used in solar cells and other organic photovoltaic devices. I became the master of near field microscopy in my lab at Michigan and developed expertise in ultrafast spectroscopy of materials."

He has won many awards and medals as an undergraduate and postgraduate which includes the Joseph Nalliah Arumugam Memorial Gold Medal for the best performance in the Faculty of Science, University of Colombo, and the award for Research excellence at the University of Michigan.

Came back to Sri Lanka soon after graduation!

"My Ph.D. advisor really wanted me to stay and work in the US. Even though I had many great opportunities, I decided to return to the country after my graduation. I wanted to have an impact on Science, Research, and Innovation in Sri Lanka. At the same time, I thought Sri Lanka is the best place to conduct my exploratory work."

His unique teaching style:

"I have observed many teachers and lecturers and was curious on how one can perform better in teaching. At the same time, I was curious about the socio-emotional skills they had. Finally, I realized that if you develop better socio-emotional skills and communication skills, you naturally become a good communicator and a good teacher. My teaching style specifically focuses on developing a Scientist who will have the empathy to understand the broader picture. What I like most is to see my students doing deeper and broader thinking in order to come up with very original and creative ideas."

By Chamilka Ratnayake and Senal Liyanage

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