

**OREPA**

# NEWSLETTER

**DECEMBER 2021**

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# **EDITOR'S NOTE**

Myself, along with the editors' committee of the OREPA student's chapter would like to express our profound gratitude to the following individuals, without whom this newsletter would not have been complete.

The Principal of Royal College Mr. M.V.S. Gunathilaka, for approving our request to obtain photographs of the College for the use in this newsletter.

Mr. T.D.C.P.Amarathunga, Senior Master in Charge of Clubs and Societies of Royal College for guiding us with his wisdom and being a strong friend of the association.

The Chairman of the photographic society of Royal College, Mr. Chandathapa Senarathna and the members of the RCPS for accepting and completing the arduous task of photographing the College and providing us with the photographs by the requested time. The credit of all photographs of the College used in this newsletter goes to the Photographic Society of Royal College.

Dr. Sajith Wijesuriya, an eminent old Royalist and a successful mechanical engineer, for sparing some of his valuable time for an interview, which enriched this newsletter more than any other article.

Mr. Rusika Kavirathna, an undergraduate of the Faculty of Medicine, University of Ruhuna for accepting our request to write an article about the vaccines used to combat COVID 19.

I now rest my pen after expressing my sincere, heartfelt gratitude towards these individuals who sacrificed their time and effort to make this newsletter a success.

**Lakdinu De Silva  
Faculty of Engineering,  
University of Ruhuna.**



# RAPID REVISION

The performance of a student at the A/L examination is a deciding factor of the future of their lives. Therefore it is important that students understand the gravity of this national examination. With the view of improving the performance of students who are hoping to someday become engineers in the field, the OREPA organized the "Rapid Revision" program.

The program was conducted by students who had successfully completed their A/L examination, receiving results sufficient to qualify them for university entrance as engineering undergraduates. The project was conducted for grade 13 students in the form of sessions each lasting for two hours. Thirteen such sessions were conducted and covered the subject's Physics, Chemistry and Combined Mathematics.



The main objectives of this program were to provide support for A/L students in their academics and to share experiences of recent A/L students so that students can take the appropriate practical approach towards this national examination.

The key performance indicators of the project were: student participation, the improvement of performance at term test examinations and the improvement in performance at the A/L examination.



ARTICLE BY : MUDUKA SENARATH



# INGENIUM '21

Ingenium '21 'A Guide Towards Engineering' was a program organized by the OREPA to provide a boarder understanding about the career possibilities which are open to a student who may choose to follow the physical science stream. Four resource persons were invited to provide a background about engineering. The purpose of this program was to assist students to plan their future by enlightening them upon the opportunities and possibilities of the engineering profession.

Owing to the pandemic situation the program was conducted over online platforms on the 15th of November 2021. The program started at 6.00 PM and was conducted via Zoom for one and a half hours. To improve the level of exposure students get towards engineering, the session was conducted by resource persons from different backgrounds related to the field of engineering.



Dr. Tharindu Miyanawala, a lecturer at the University of Moratuwa was invited to give academic background and explain possibilities relating to higher studies in the engineering profession.



Mr. Champika Periyapperuma an Electrical engineer and director (CTO) of Regen Renewables (Pvt.) Limited was invited to give an industrial background and explain the life of the being an engineer in the industry.



Dr. Rashmika Nawaratne, a data scientist of Coles group (Australia) was invited to give a foreign background and explain higher studies as well as industrial opportunities in foreign countries.



Undergraduate student Mr. Randula Abeyweera who was the 6th in the district at the 2016 G.C.E A/L examination was invited to share his experiences in the university and to give some practical advice to Advanced Level students.

The moderator, Mr. Savin Gunawardena directed questions to each panelist based on their field. The panelists answered the questions based on their experiences. The event ended with a question-and-answer session after which, participant feedback was collected. The positive feedback received was a clear indication of the success of the program.



ARTICLE BY : MOHAMED MUSHRIF

# GOING CIRCULAR



The current economic system employed in countries throughout the world is a linear system. Raw materials are collected, shaped into products, used, and disposed. Though this system humans transformed from cave dwellers to space farers, it has reached its limits due to the limited availability of materials on earth. It is with this limitation that humans started to realize that resources are not infinite.

To put the limited availability of raw materials into perspective, the gold, silver, lead, and uranium reserves on the earth are estimated to be completely depleted within the next 50 years. This makes us wonder what is to be done after we have exhausted all the raw materials we need to continue life as we know it.

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To address this issue, engineers took an example of how nature operates on Earth. The Earth is one cohesive circular system, whatever is used by one organism is reused by another, the waste of one organism becomes the nutrition for another. This circular behavior has been achieved by millions of years of evolution. The concept of circular economy is derived from the way nature operates.

If the lifecycle of a fan in the current economy is considered, the value of the fan increases as the raw materials are shaped into the product and the value stays approximately at a constant value through the period of use by a consumer. However, if a certain component of the fan breaks such that the fan becomes irreparable, the value of the fan drops close to zero. However, the value of the materials still stays the same. Ideally the value reduction should only be that of the broken component. A circular economy will recognize the value of the materials, regardless of whether the product functions as a whole.



An economy can be said to be circular if it does not release any waste to the environment, but rather sends its waste to be used by another company which may see a value in it. This way resources will circulated within the economic system changing hands from company to another and serving in many products but still remaining within the economy and not being discarded.



Companies in a circular economy will offer services instead of products, for instance, a ceiling fan company will not sell fans to consumers but rather lease them for a certain period. During that period, the company will maintain the fan and repair it in case of a malfunction. Once the fan has reached a state where it cannot be repaired, the company will replace it with a new fan and will transport the old fan back to the factory for recycling. The advantage of this system is that recycling becomes a lot more efficient as recycling is easier to do in the very company which manufactures the product than in an external recycling plant. In the present day, a recycling plant will have to recycle materials manufactured from different industries which makes recycling costly and inefficient.

The role of engineers is to engineer the future, as the famous aeronautical engineer Theodore von Karman once said:



Engineers need to understand the validity and the practicality of this concept and start to pave the way so that one day our country may have a circular economy.

ARTICLE BY : LAKDINU DE SILVA



# **AN ENGINEER'S THOUGHTS**



**Before your Ph.D., or the degree. You were a proud royalist. How was your experience as a student at mother Royal ?**

I joined Royal College in grade 6 in 1999 and it was a Drastically different experience for me as I was coming from a relatively small school. Even though I expected an environment that would be very difficult for me to get familiarized with or adapt, actually it wasn't. I think the prime reason for that was the friendly staff and the colleagues. Royal college always tried to maintain an inclusive and generic environment for all the students despite their skin colour, background, and whatnots.

**At school what sort of a student were you?**

Generally, the students who enter the college with the grade 5 scholarship results, are more focused on academia. Likewise, there were no exceptions for me also. Even though I was mainly prioritizing academia, I engaged in some sports like basketball and cricket also. Moreover, I was a scout for a while but had to stop due to some health conditions. On the other hand, I was a member of the art circle for a long period due to my keen interest in the arts. Despite all of these what I always tried was to balance academics with other extracurricular, and mother royal catered a very conducive setting for that.

**Studying at Royal College is an opportunity which lots of people expect but only a few receive? Entering royal college, do you think it's a turning point in your life, and how impactful was it for your later academic and professional carrier?**



Yes of course it was a turning point and was highly impactful for my later academic and professional carrier. I think the biggest offering from the college was that opportunity to explore and learn new skills and abilities. Whatever the sport, society, or skillset that a student search for not only the college had it but also had an outstanding history about it. Therefore, it helped me acquire plenty of skills that I would never gain elsewhere. Hence, it was a turning point in my life.

Moreover, I was curious to explore the issues that the world is facing, and the college provided a platform for us to speak and seek answers for them. The academic staff of the school played a prominent role in making that platform for the students. Even though the Sri Lankan education system had a relatively narrow scope compared to other countries when it comes to the opening into the world, Royal college managed to bridge that gap through societies like mathematical society, science-related societies, etc.

Besides, the leadership qualities that I gained at school were massive. I was able to know the student issues and learned how to solve them, while I was a steward and a senior prefect. Royal College being consists of a large as well as a diverse community helped me a lot to know how the perspectives of people differ from each other depending on their background. Hence, this was really useful for me in my later academic and professional life to recognize and understand people.

**At the University there are different engineering streams. Was there a particular reason for you to choose mechanical engineering?**

**You are a proud product of the University of Moratuwa, and some say that University life gives you the best memories. Are there any unforgettable incidents or memories that you liked to share with us?**

When you compare University and school the life, at the University had more freedom compared to school life. So, as I mentioned earlier, I learned a lot about the community at school. Similarly, at University the community was even more diverse, and a lot were nearly adults and they had very different perspectives than the school students. So, the experiences I had with them were way more different than what I had at the University. In 2010, we organized a large exhibition at the university, and I was able to actively participate in most of its tasks. That was a place where I put the experiences that I had during my school days into action to prove that we are capable of hosting the exhibition. I could remember how every day and night we spent trying to achieve goals, getting certain promotional materials finalized, pitching sponsors. That was a beautiful experience and an unforgettable experience for me.

Immediately after leaving school, we didn't have much of a perception of the way that industry work. Therefore, it was very challenging for an undergraduate to choose the most suitable field, I think that's the main reason, undergraduates select the most demanding field rather than the field that is suited for them. Therefore, the important part is not to focus on the present but to see in which field that you wanted to contribute within the next 10 years. Anyway, at school, we had that opportunity to expose and experience subjects like computer science-related features and activities. However, at that time when I evaluate the industry which I understood was that the world is moving towards energy transformation, which is the case now. Accordingly, I had two options either go for electrical or mechanical. Mainly electrical considered energy generation, distribution, and transmission, while mechanical engineering was more about the core element of energy generation. Thus I decided to select mechanical engineering. Nowadays I don't think the students don't have this luxury to decide like this, but I think it would be impactful if they could evaluate before choosing their respective fields. However, at the end of the day, it's up to the students to choose something that they are passionate about.

**You have worked as an Engineer intern at Lanka ports Authority and also as a research intern at Colorado. Based on your experiences how important is an internship for an undergraduate?**

Internships are very important for a person. However, if the interns do not get enough exposure, they will become discouraged and the total undergraduate internship period would be an utter waste. According to my perspectives firstly, the internship providers should expose interns to actual practical work. Secondly, internships must be paid well. I think the salary must be at least close to an entry-level job. Back in my days, there were good internships and bad internships. Therefore, I recommend for the undergraduates do a small search and research and select an internship. That's what I also did to get my internship at the port's authority as well as for my internship in Austria.

On the other hand, these internships could change your ambitions. In my case, I was always persuaded to get a corporate job. So I did CIMA, etc. But during the internship, it all changed. There I saw how much technology they have been using and how beautiful the subject is and decided to explore and live the field more.

**You are the founder and the secretary of the Science Policy circle, what was the base to establish the Science Policy Circle, and what is its role in the current world?**

In 2014 I participated in the Youth Conference at Colombo which lots of young people from more than 120 different countries participated. During the conference, one of the missing things which I realized was that though all the professionals had a ton of opportunities to engage in technical aspects of the profession, they had very little opportunity to engage in policymaking. This was a gap I saw and was the base to establish or start the Science Policy Circle.

Science Policy Circle is essentially a gathering of like-minded people who work in technological sectors intending to get involved in policy processes. We are currently working at the National as well as international levels, and do certain policymaking endeavors with the United Nations(UN) also.

**After graduating, you obtained your Masters as well as the Ph.D. in Colorado school of Mines. So, is there a particular reason to choose this, and do you recommend this to our future undergraduates who are willing to do either a Master's or a Ph.D.?**

Colorado School of Mines is a small research-focused university. There were only around 5000 students and didn't have a lot of faculties like Law, medicine, arts, etc. Environment and Energy were the two prominent fields of this university. That was my requirement since I needed to keep myself in this narrow scope of energy requirement. In addition, for my final project at the University of Moratuwa, the university lacked some resources which I needed to execute it, so I ultimately ended up doing something theoretical and published it, but it was not satisfactory for me. That's when I tried to find a university that could cater to my requirement to complete my project and to continue doing more research within this field. So, among all the options I found the Colorado School of Mines as the most suitable option since it is located very next to National Renewable Energy Laboratory and had a large number of collaborations with the National Renewable Energy Laboratory. That was a healthy geographical placement for a person like me who wishes to continue his career in Energy transformation. Ultimately that was the main reason to choose this particular university, and it wasn't a very hard choice in the end.



Therefore, I recommend it to the people who wish to follow their carrier in energy-related sectors.

**As a person who has been into both Local as well as foreign universities was there a particular difference that you saw either within universities or among students?**

In terms of students, I don't see much difference. Both the students are committed, determined, talented. Other than, the cultural differences everything is more or similar. The main difference that I sensed between the universities was the lack of resources. I think local university students up to some extent have access to the resources, but when you compare the talents of the local and foreign students, I don't see a difference at all. In that case, I think local students deserve more. Anyway except for the resources I didn't see any drastic differences.

**Currently, you are working at National Renewable Energy Laboratory, USA, what is your role there?**

I started as an intern at National Renewable Energy Laboratory, USA and right now I am a post-doctoral researcher. National Renewable Energy Laboratory is one of the seventeen National laboratories in the USA and most of the demanding renewable energy researches happens in National Renewable Energy Laboratory. After a Ph.D. everyone should do post-doctoral research. Usually, this post-doctoral research is a continuation of the Ph.D. research or something very close to it. The main objective is to obtain more out of the research Ph.D. Some of the research that I am currently engaged in is confidential. Therefore, what I could disclose is that currently I am engaged in some renewable energy-related research.

**You are a person who achieved a lot in life, and for sure you might have experienced some obstacles even sometimes failures, what would you do whenever you faced an obstacle or a challenging situation in life?**

Yes, that's a good question, whenever something is not going according to the way you expected, what we feel like doing is to change the field or try something different. Ultimately when people feel like every road is going to end before you reach your destination, they give up. However, if you are confident and if you have really thought about your current field well, it's always good to give it some more time, while doing some minor changes and hanging in there until something better happens. So that's what I have learned through the challenges that I faced in my carrier. Especially, during my research period there were times where I didn't get that expected result, so what I did was to try and hang there rather than give up. What I believe and what I have experienced is that if we have confidence about ourselves or about what we are doing, at the end of the tunnel there will be a light, so deviating from the field or giving up would not be the best option at that time.

## Finally, is there a piece of advice that you want to give to the royalists out there?

Yes, when I reviewed my school days and the experiences, what I really think that has helped me a lot now is the skills that I acquired during my school days. Therefore, I advise all fellow royalists to earn skills as much as possible not only from academia but also from sports and societies also. The benefits that I have been enjoying because of that gained skills are priceless. On the other hand, if you ever get an opportunity for a leadership opportunity, I highly recommend all the royalists to accept it because that's the best way that you could engage with society. Furthermore, those leadership positions will come in handy whenever you face difficulties in life because leadership positions train a person to solve problems to earn the benefits that are required. As a final remark grab every opportunity that you receive and extract the maximum out of it because that would help you to stand out from the crowd.



IEEE PES Kerala Chapter

Welcome



Sajith Wijesuriya

Postdoctoral Researcher, NREL



2021 13th IEEE PES Asia-Pacific Power & Energy Engineering Conference (APPEEC)

INTERVIEWED BY : SUTHIRA WIJAYAWARDENA

# **TERM TEST PAPER CAMPAIGN**

With the COVID epidemic, a crisis had arisen over the conduct of final exams of 2021 A/L students. The school administration requested OREPA to prepare the final question papers for the 2021 A/L category this year as the OREPA student chapter had previously prepared and discussed model question papers targeting A/L students.

OREPA Student Chapter took the task of completely compiling the Combined Mathematics and Physics term test papers along with their marking schemes.



Term test papers with their respective marking schemes were prepared in English, Sinhala and Tamil languages with the involvement of university students who wrote their A/L in 2017, 2018, 2019, 2020. 17 members participated in the preparation of the Physics question paper and 23 members in the preparation of the Combined Mathematics question paper.

These question papers were distributed to the students through the online system and were discussed. The Combined Mathematics question paper on 4th and 5th October and the Physics question paper on 6th and 8th October were given and discussed through zoom.



**ARTICLE BY : DASUN KARUNARATHNE**

# LIVING WITH COVID 19

## VACCINES

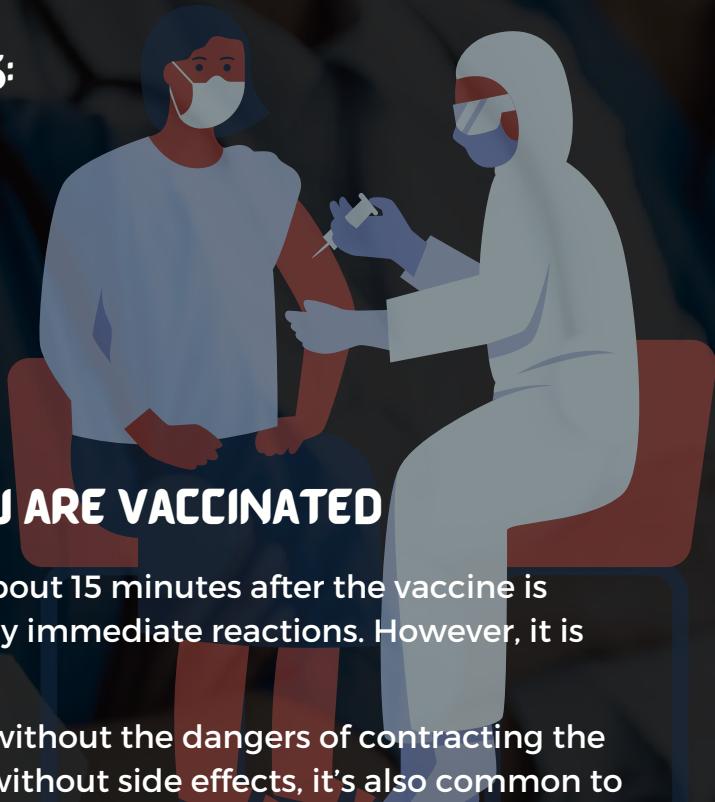


Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. Most people who fall sick with COVID-19 will experience mild to moderate symptoms and recover without special treatment. However, some will become seriously ill and require medical attention.

A COVID-19 vaccine is a vaccine intended to provide acquired immunity against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that causes coronavirus disease 2019 (COVID-19).

### THE TYPES OF COVID 19 VACCINES:

- Inactivated vaccines
- DNA vaccines
- RNA vaccines
- Live attenuated vaccines
- Viral vector vaccines
- Protein vaccines



### WHAT SHOULD YOU DO ONCE YOU ARE VACCINATED

The doctor or nurse should observe you for about 15 minutes after the vaccine is administered to make sure you don't have any immediate reactions. However, it is extremely rare for severe health reactions.

Vaccines are designed to give you immunity without the dangers of contracting the disease. While it's normal to build immunity without side effects, it's also common to experience some mild-to-moderate side effects that go away within a few days on their own.

Some of the mild-to-moderate side effects you may experience after vaccination include: Arm soreness at the injection site, Mild fever, Fatigue, Headaches, Muscle or joint aches, Chills and Diarrhoea.

If any symptoms continue for more than a few days or if you experience a more severe reaction, then contact your health care provider immediately.

ARTICLE BY : RUSIKA KAVIRATHNA

# A GLANCE AT 2021

The major projects conducted by OREPA for the year 2021 and the impact of these projects.

## **Esports Competiton**

This project gave the opportunity for gamers around the island to showcase their skills in a COD gaming competition.

## **Spring Into Action**

Under this project, the culture of research and development was promoted among undergraduates.

## **Industrial Insights**

This project was conducted to establish and maintain relationships between professional engineers and engineering undergraduates.

## **Cybots Bootcamp**

This project was organized to promote the understanding young Royalists have towards robotics by conducting a virtual webinar.

## **Term Test Paper Campaign**

Under this project, the final term test papers were prepared for students of grade 13.

## **Ingenium '21**

Students were given a glimpse into the opportunities present to a professional engineer.

## **Rapid Revision**

Revision sessions were conducted to enhance the performance of students at the G.C.E A/L examination.

## **An Engineer's Thoughts**

The interview was conducted to share the thoughts of an eminent engineer with our readers.

# **EDITORIAL COMMITTEE**



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“OREPA, as a host of technical experts in many facets of engineering and related fields, opens up a reservoir of knowledge, technical expertise, and material support in the fields of engineering, architecture, and related fields for the benefit of the students and the youth. OREPA is looking forward to becoming a key stakeholder of the Royal College and the community. This professional newsletter provides news on our projects, events, and achievements to promote sustainability and youth empowerment within and beyond Royal College.”

Please send your thoughts and insights to empower our initiatives;

**OREPA Student Chapter – Editorial Board**  
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WISHING OUR READERS A

HAPPY NEW YEAR

2022

**OREPA**

