Vol. 5 Issue 03- Jul to Sep, 2022

Dr.M.G.R.
Educational and Research Institute
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University with Graded Autonomy Status
Maduravoyal , Chennai - 600 095

FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF MECHANICAL ENGINEERING

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VOL. 5 ISSUE 3- 2022

HOD-DESK

MESSAGE

by,
Dr.K.RAJAN
HOD / Mech

Greetings!!

I am glad that Dr.MGR University has provided us an opportunity and vision to support the release of Newsletter series through all the quarters of each academic year. It's a forum to connect with all stakeholder. I am very happy that the department is releasing the News letter for the period July 2022-to September 2022. Wishing for many more series and happy reading.

MESSAGE

by,
Dr.K.R.VIJAYAKUMAR,
Deputy HOD/Mech.

The Newsletter is a platform exhibiting the activities of the department besides bring out the creative literary and artistic talents of our faculties and student community I congratulate the team behind and wish them all the success. Wishing, the Newsletter series, would bring the desired results sooner than expected and pave the way for new ideas to surface.

VOL. 5 ISSUE 3- 2022

MESSAGE

by,
Dr.A.MANOJ BABU,
Deputy HOD/Mech.

The Newsletter is a mirror that reflects the activities of the department. Students from all walks of life find their voices heard in this space that welcomes and encourages diversity of thoughts and perspectives with open arm. Pleased to see that our department is releasing its third quarter Newsletter for 2022. I wish the purpose is realized and achieved.

VOL. 5 ISSUE 3- 2022

MESSAGE

It gives us immense pleasure to be an integral part of this news letter, a communication method suited to the needs of the time which would carry messages to all concerned about important events, happenings and achievements. This certainly should play an effective role in creating a sense of belongingness amongst faculty team, alumni and students. Life can't have rewinds rather only flashbacks. Talented alumni will likely have a wealth of experience and skills to share with current students via talks and newsletters. We consider that our endeavors will be successful only when ,after reading these articles you get motivated to contribute more in future issues.

EDITORIAL BOARD

Mr.W.Andrew Nallayan - Asst Prof
Mr.D.A.Vinoth - Asst Prof

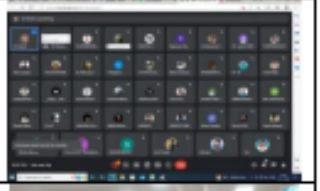
Ravi Rajan N - III Robotics and Automation Engineering
Jaison & Sumit - III Mechanical Engineering
Madhu Sudarsanan - II Robotics and Automation Engineering
Deepanshu Roy- II Mechanical Engineering

VOL. 5 ISSUE 3- 2022

ACTION CORNER

SNIPPETS FROM PALS

JULY TO SEPTEMBER

DATE	EVENT TITLE	SPEAKERS	EVENT COORDINATE
06-Sep-2022	Subject Lecture on GDNT	Mr. K.V.GOPAL, Assistant Professor Department of Mechanical Engineering Dr.M.G.R Educational and Research Institute	
06-Sep-2022	Alumni Lecture Series-13 on "The Future of Direct to Consumer Brands"	Mr. NAVEEN DUBEY, Founder & CEO, TND International and TND 360° A Performance Training Company,	
07-Sep-2022	Professional Society on IPA Student Chapter	Mr. A. JOSEPH MATHEW, Chairman, IPA Chennai Chapter, Institute of Plumbing (IIP - an IPA initiative)	
13-Sep-2022	Subject Lecture on Alteranate Fuels	Dr. BALAJI, Application Engineer, NXplorers, Learning Links Foundation,	
16-Sep-2022	Technical Talk on Role of Engineers in Mechatronics & Robotics Applications	Dr. SUBHASIS BHAUMIK, President Institution's Innovation Council (IIC) (IIEST), Indian Institute of Engineering Science & Technology (IIEST)	
17-Sep-2022	ISR on Coastal Cleanup	Mr. MAHMOOD SAIT Chairman URBASER Global Environmental Management Company	
28-Sep-2022	Interdisciplinary Talk on Artificial Intelligence for Mechanical Engineering	Dr.ANAND, Professor Dr. M.G.R. Educational and Research Institute	

VOL. 5 ISSUE 3- 2022

ARTICLES CORNER

15 UNUSUAL COUNTRIES TO STUDY ABROAD YOU SHOULD CONSIDER THIS YEAR

by,
. Mr. Andrew Nallayan,
Asst. Professor/ Mech Engineering.

Most students who want to study abroad look to the most common study abroad destinations. As a result these popular countries become more competitive for international students. They are often more costly, and getting the necessary documents and visa could be difficult.
It will interest you to know that there are unusual destinations around the world that have, in recent times, been attracting a drove of international students. They are not your usual study abroad destinations like UK, Australia and Canada. But they are sure worth looking into.

1. THAILAND

This beautiful Asian nation is decorated in stunning beaches, exquisite temples, and rising cities. Thailand is the perfect location for students who want to find unique study abroad programs. Thailand offers students a mix of cultural immersion and adventurous destinations all while providing an exceptional educational experience. Nearly all the major universities have academic tie-ups with international universities. This facilitates exchange programs by both students and academics. Tuition fees are also cheap between $1000-$2000 per year.

2. ISRAEL

Israel is one of the smallest countries on earth, tucked between Egypt, Jordan, Syria and Lebanon. The country is however rich in culture and is birthplace of two of the world's major religions. As a student, one of your main concerns with studying overseas is the quality of the institution you will be attending. Israel's higher education institutions are known worldwide for academic excellence. With several universities ranked amongst the highest in the world, excellent colleges and research institutes, Israel offers you a high quality academic experience!

3. IRELAND

Ireland is well-known for many things, including Guinness, pots of gold, and Irish dancing. But something that you might not have known is that it has a small but perfectly formed selection of universities. From the Hogwarts-esque Trinity College Dublin to the modern Royal College of Surgeons in Ireland (RCSI), there will be an institution to suit you. All courses are taught in English. Tuition is free for EU students while students from outside this area have to pay. Ireland enjoys proximity to the rest of Europe making it an attractive study abroad destination. Depending on your interests, you can spend your spare time hiking around the Emerald Isle or taking refuge in a pub to sample some Guinness.

4. NEW ZEALAND

New Zealand is quickly becoming one of the most popular study abroad destinations in the world. The weather offers a wonderful temperate for the majority of the year and allows for a plethora of fun activities, including kayaking, golfing, rugby, and cricket. New Zealand has only eight universities but they all rank in the top 600 in the World University Rankings. Each university sets its own tuition fees, so course costs will vary depending on where you decide to study. Although tuition fees are on the pricier side for international students ($25,000-$75,000) the cost of living in the country is relatively low.

5. NIGERIA

Nigeria has three universities in the World University Rankings and has over 130 institutions in total. Its top university, Covenant University is ranked among the top 500 universities in the world according to Times Higher Education, and among the top 200 young university ranking. All university courses are taught in English. Nigeria is a highly diverse country, with a lot to offer international students. Tuition fees in the country's federal universities are some of the lowest in the world with some charging as low as $40. The cost of living is equally low in the country.

6. MEXICO

Full of interesting and unique culture to explore, Mexico is one of Latin America's most-visited nations, and has lots to offer international students. Tuition fees vary, with private universities charging more, and average around US$6,300 per year for international undergraduate students. Living expenses are reasonably low in Mexico. Although the main language of instruction is Spanish, Mexican universities are offering more English-taught courses to attract international students.

7. BRAZIL

Brazil has an impressive number of universities, many of which appear in the World University Rankings and dominate the Latin America University Rankings. A key selling point of studying in Brazil is that public education is free up to postgraduate level. This means that most public institutions will only charge students a registration fee. Before applying to a university in Brazil, students must prove that they are able to study in Portuguese and take the admission exams. Students will also need to obtain a visa before heading to the country. If you decide to study in Brazil, you'll be making the choice to study in a lively, bustling country.

8. SLOVENIA

Slovenia is located in the heart of Europe with easy access to neighbors; Italy, Austria, Hungary and Croatia. Universities in Slovenia are used to foreign students. Professors always take additional time for you, and they are usually less demanding towards foreign students. The majority of Slovenians are fluent in at least one foreign language - usually English or German. You'll have no problem having nice conversations with people in English. The country also offers one of the cheapest tuitions in Europe with fees ranging from $1500-$6000. Cost of living is also relatively low.

9. INDIA

India is one of the biggest countries in the world by population, and higher education is a part of that. The recently launched Study in India programme aims to encourage more than 200,000 international students to come to India by 2023. It now also has one of the largest higher education systems in the world. Many of the institutions in India focus on science and engineering programmes but arts and humanities programmes can be found in some of the general universities such as the University of Delhi or Tezpur University. Students can lead a relatively frugal lifestyle in India as the cost of living is much lower than in many other countries around the world.

11. TAIWAN

Taiwan nods at ancient Chinese, Taiwanese and Japanese culture and history while embracing the age of technological advancement. The top university in Taiwan, National Taiwan University, is in the top 200 of the World University Rankings and there are 32 Taiwanese universities in the World University Rankings in total. Tuition fees in the country are pretty cheap, although they do vary across courses and institutions. Fees for international students are less than £1,000 per year at most universities, but you can expect to pay more at a private institution.

12. MOLDOVA

This European country is tucked between Romania and the Ukraine and has come a long way in a short time. While you may not be familiar with Moldova, it produces indisputably some of Europe's most interesting wines and has a growing tourism industry. Home to 15 public university and 10 private universities, Moldova's higher education system is structured in the European tradition, and offers a broad range of courses at the undergraduate, Master's and Ph.D. levels. The majority of the courses are taught in Romanian, but most universities also offer programs in English.

13. SOUTH KOREA

Known as one of the four "Asian Tiger" economies, this powerhouse nation has seen an exponential increase in the number of international students over the past 10 years. The government has invested heavily in its higher education sector in a bid to build international ties through scholarship opportunities, streamlined visa applications and attractive employment opportunities. The country offers a lot of English courses and universities from the US and UK have campuses in the country. Tuition fees range from $3500-$6000.

14. SOUTH AFRICA

Nicknamed "the rainbow nation," South Africa celebrates diversity and is heralded for its multicultural feel. Of all the areas undergoing growth right now in South Africa, higher education is at the top of the list. South African universities rank high both on the continent and in the world with the University of Cape Town ranking as Africa's best university. There are also a number of scholarships available to international students and the cost of living in the country is relatively low.

15. MALAYSIA

Malaysia is one of the most beautiful countries in Asia and undoubtedly one of the cheapest countries to study abroad. Its capital, Kuala Lumpur, came first for affordability in the QS Best Student Cities 2016, and most students will only need about $3,550 per year to live comfortably in Malaysia. Malaysia is also home to a number of branch campuses of international universities, such as the UK's University of Nottingham or Australia's Monash University, offering the opportunity to gain a degree accredited by these institutions at a lower cost.

There you have it. 15 unusual countries to study abroad you should consider in. Until next time, YOUR SUCCESS MATTERS!

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INDUSTRY 5.0

BY,
S. DEEPANSHU ROY
2 ND YEAR /MECH DEPT

History:

The Industrial Revolution was a period of major mechanization and innovation that began in Great Britain during the mid-18th century and early 19th century and later spread throughout much of the world. The British Industrial Revolution was dominated by the exploitation of coal and iron. Although the Industrial Revolution occurred approximately 200 years ago, it is a period that left a profound impact on how people lived and the way businesses operated. Arguably, the factory systems developed during the Industrial Revolution are responsible for creating capitalism and the modern cities of today.

What is Industry 5.0?

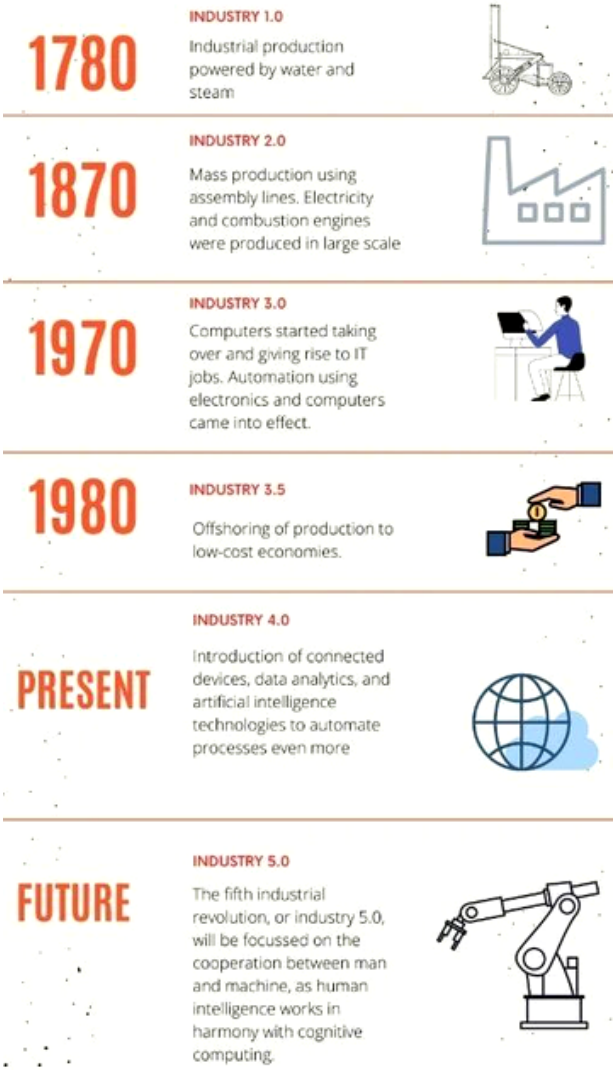
The term Industry 5.0 refers to people working alongside robots and smart machines. It's about robots helping humans work better and faster by leveraging advanced technologies like the Internet of Things (IoT) and big data. It adds a personal human touch to the Industry 4.0 pillars of automation and efficiency.

"The Fifth Industrial Revolution is evolving from a concentration on the digital experience to one where humans are back in charge,"

- Dan Gamota

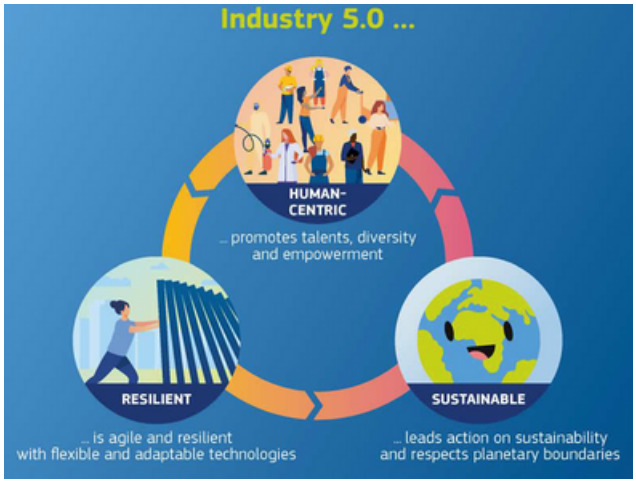
Previous Industrial revolutions:

1. The First Industrial revolution was started in the 1760s. It is the transition from hand production methods to machines. So, mechanization is the first industrial revolution.
2. The Second Industrial Revolution was started in about 1880s, which included mass production, electricity etc.
3. The third Industrial Revolution was started in about the 1980s. It is the transition from electrical to electronics, which means IT revolution, automation etc.
4. Industrial revolution 4.0 or Industry 4.0 is the era of Cyber-Physical Systems. It is a collaboration of machines, Artificial Intelligence, Robotics, Nanotechnology, IoT, Biotechnology etc. This current
5. trend of fusion of technologies, which is basically a collaborative era.



Why it is necessary:

1. The changes set in motion by Industry 5.0 are already irreversible. This process offers companies the abilities of increasingly powerful machines in combination with better-trained experts to foster an effective, sustainable and safe production.
2. Industry 5.0 is not a fad, but rather a new way of understanding manufacturing that has productive, economic and commercial consequences. Therefore, companies that do not tailor their production to the factory 5.0 model will soon become obsolete, being unable to benefit from the competitive advantages that it has to offer.
3. Not only that: the rate of technological acceleration is increasingly faster and shows that the emergence of new paradigms never stops. For this reason, adjusting the processes of each company and transforming them into the concept of digital industry will be vital in guaranteeing that an organization remains competitive.



Benefits of Industry 5.0:

1. It aims to correct the previous industrial revolution by developing technologies in a human-centric way. It empowers workers instead of replacing them with machines.
2. Cobots (collaborative robots), which are people-focused robots will take care of the monotonous or unsafe tasks and humans will refine the work. So, humans will have control over everything.
3. The fifth industrial revolution focuses on protecting the environment too by focusing on sustainable manufacturing, circular economy, resilient business models etc.
4. It allows hyper-customization to improve the customer experience. It means consumers will have more personalized products.
5. Industry 5.0 increases the profits of companies because cobots and humans work together to make the best decisions to achieve more profits from fewer resources.

Challenges:

- Adapting to Industry 5.0 requires huge investment, which is a big obstacle for some companies. Companies that do not adapt to the principles of Industry 5.0 may not be able to compete with the companies that utilized the advantages offered by it.
- Tackling cyber security threats is one of the biggest challenges.
- Training a large number of people to suit the changing nature of jobs is another challenge.

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FORMULA 1

BY,
SUMIT R.,
3RD YEAR /MECH DEPT.

A Formula One car (also known as an F1 car) is a single-seat, open-cockpit, open-wheel formula racing car with substantial front and rear wings, and an engine positioned behind the driver, intended to be used in competition at Formula One racing events.

History

History The early years and the continuation of pre-WWII supercharged engines (1946–1950) Formula One was first defined in 1946 by the Commission Sportive Internationale (CSI) of the FIA, forerunner of FISA, as the premier single-seater racing category in worldwide motorsport to become effective in 1947. This new "International Formula" was initially known variously as Formula A, Formula I, or Formula 1 with the corresponding "Voiturette" formula being titled Formula B, Formula II, or Formula 2.

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PAPER UMBRELLA

BY,
MADHU SUDARSANAN.,
2 ND YEAR /ROBO DEPT.

Bored of random newspaper folds, I thought of making something colourful and name a theme.

SEASONS! Once I decided on seasons, the first one sparked in my mind is monsoon rains! Being in Vellore at that time, I was caught between scorching heat and respite from sudden incessant rain!

Vellore receives rains on both monsoons and I LOVE RAIN!

I thought of making a working umbrella using a coloured paper. This umbrella was not made out of a single sheet as I usually do. The stick part is a separate one so that the umbrella slides on it smoothly.

The umbrella part is technically difficult as it needs careful tiny equivalent folds to get a perfect shape and fit.

This is my mum's favourite out of many crafts I made for her!

VOL. 5 ISSUE 3- 2022

SUCCESS STORY OF WARREN BUFFETT

BY,
MARTIN MANOJ D.,
2 ND YEAR /ROBOTICS &
AUTOMATION DEPT.

FROM SELLING SOFT DRINKS TO MAKING BILLIONS OF DOLLARS

Introduction:

Warren Edward Buffett, the legendary value investor, turned an ailing textile mill into a financial engine that powered what would become the world's most successful holding company.

Known as the Oracle of Omaha for his investment prowess, Buffett has amassed a personal fortune in excess of $100 billion, according to Forbes.1 He inspires legions of loyal fans to make a yearly trek to Omaha, Nebraska, for an opportunity to hear him speak at Berkshire's annual meeting, an event ironically dubbed the Woodstock of Capitalism.

Early Life and Education:

Buffett was born to Howard and Leila Buffett on Aug. 30, 1930, in Omaha, Nebraska. He was the second of three children, and the only boy. His father was a stockbroker and four-term U.S. congressman. Howard Buffett served non-consecutive terms on the Republican ticket but espoused libertarian views.2

Making money was an early interest for his son, Warren, who sold soft drinks and had a paper route. When he was 14 years old, he invested the earnings from these endeavours in 40 acres of land, which he then rented for a profit. At his father's urging, he applied to the University of Pennsylvania and was accepted. Unimpressed, Buffett left that university after two years, transferring to the University of Nebraska.

Upon graduation, his father once again convinced him of the value of education, encouraging him to pursue a graduate degree. Harvard rejected Buffett, but Columbia University accepted him. Buffett studied under Benjamin Graham, the father of value investing, and his time at Columbia set the stage for a storied career, albeit one with a slow start.

Upon graduation, Graham refused to hire Buffett, even suggesting that he avoid a career on Wall Street. Buffett's father agreed with Graham, and Buffett returned to Omaha to work at his father's brokerage firm. He married Susan Thompson, and they started a family. A short while later, Graham had a change of heart and offered Buffett a job in New York.

Unlike his mentor Benjamin Graham, Buffett wanted to look beyond the numbers and focus on the company's management team and its product's competitive advantage in the marketplace when considering an investment.

Notable Accomplishments:

Once in New York, Buffett had the chance to build upon the investing theories he had learned from Graham at Columbia. Value investing, according to Graham, involved seeking stocks that were selling at an extraordinary discount to the value of the underlying assets, which he called the "intrinsic value". Buffett internalized the concept, but had an interest in taking it a step further.

In 1956, he returned to Omaha, launched Buffett Associates, and later purchased a house. In 1962 he was 30 years old and already a millionaire when he joined forces with Charlie Munger. Their collaboration eventually resulted in the development of an investment philosophy based on Buffett's idea of looking at value investing as something more than an attempt to wring the last few dollars out of dying businesses.

Along the way, they purchased Berkshire Hathaway (BRK.A), a dying textile mill. What began as a classic Graham value play became a longer-term investment when the business showed some signs of life. Cash flows from the textile business were used to fund other investments. Eventually, the original business was eclipsed by the other holdings. In 1985, Buffett shut down the textile business but continued to use the name.

Wealth and Philanthropy:

What do you do with your money when you are the world's most successful investor? If you're Warren Buffett, you give it away. Buffett stunned the world in June of 2006 when he announced the donation of the vast majority of his wealth to the Bill & Melinda Gates Foundation, which focuses on world health issues, U.S. libraries, and global schools, among other issues. It is one of the world's largest transparent charities.

Buffett's donations will come in the form of Class B shares of Berkshire Hathaway stock. His total donation to the Gates Foundation is 10 million shares. It will be given out in 5% increments until Buffett's death or until the foundation fails to meet the spending stipulation or the stipulation that either Bill or Melinda Gates remain actively involved in the foundation's activities. Buffett's 2006 donation was 500,000 shares, valued at approximately $1.5 billion.

In June 2022, the foundation's CEO, Mark Suzman, sent an email to the Bill & Melinda Gates Foundation employees. The email was also shared on the foundation's website that Buffett's contributions since 2006 have totalled more than $36 billion. Buffett expects stock price appreciation to increase that amount over time.

Personal Life:

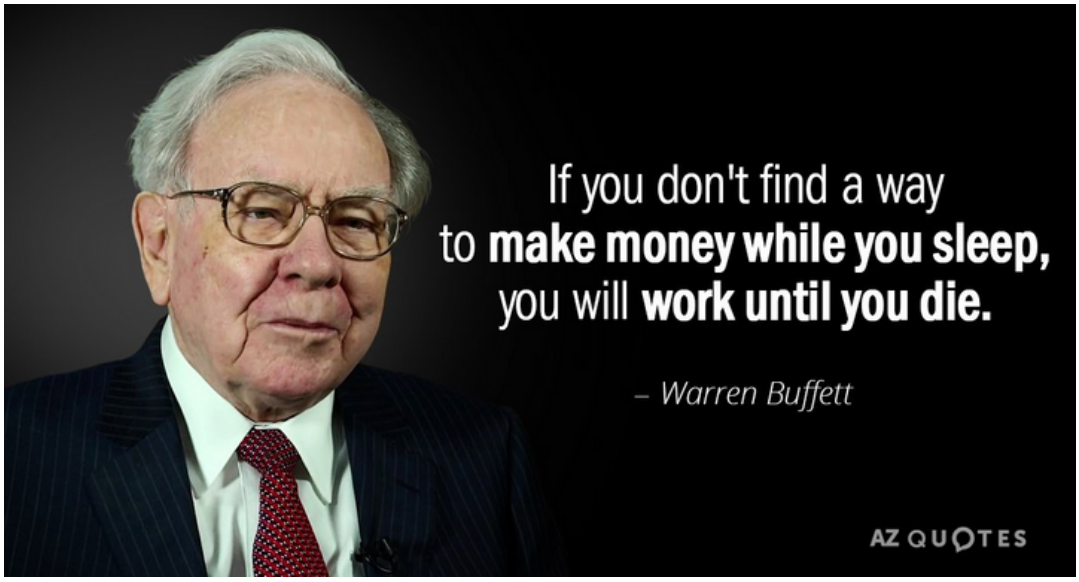
Despite a net worth measured in billions, Warren Buffett is legendarily frugal. He still lives in the five-bedroom house he bought in 1958 for $31,000, drinks Coca-Cola, and dines at local restaurants, where a burger or a steak is his preferred table fare. For years, he eschewed the idea of purchasing a corporate jet. When he finally acquired one, he named it the Indefensible—public recognition of his criticism about money spent on jets.

He remained married to Susan Thompson for more than 50 years after their 1952 wedding. They had three children, Susie, Howard, and Peter. Buffett and Susan separated in 1977, remaining married until her death in 2004. Before her death, Susan introduced him to Astrid Menks, a waitress. Buffett and Menks began living together in 1978 and were married in August 2006.

The Bottom Line:

The future looks to hold an increase in the amount of money that Buffett will continue to give. In his own words: "I am not an enthusiast of dynastic wealth, particularly when the alternative is six billion people having much poorer hands in life than we have, having a chance to benefit from the money."

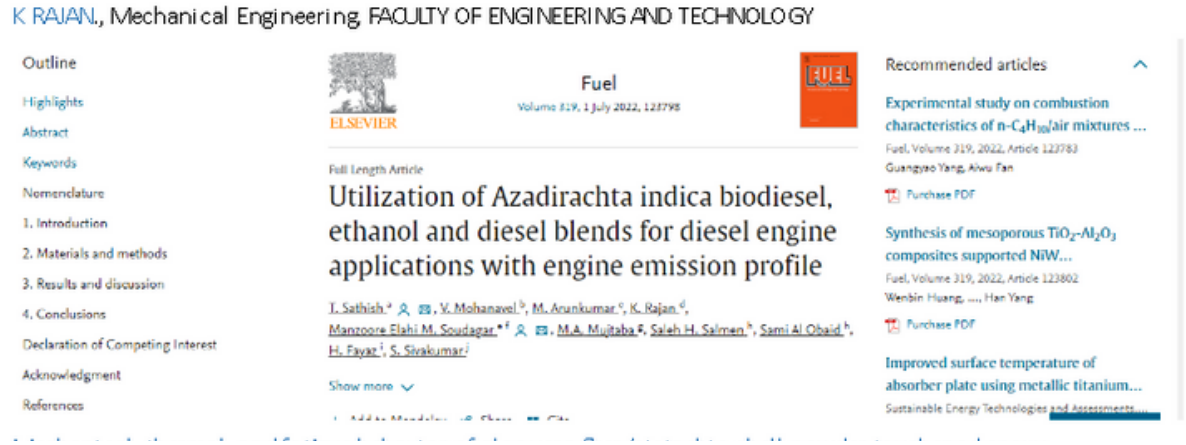
Buffett has made his fortune by relying on the time-tested rules of value investing, meaning finding high-quality companies at fair market valuations. He then holds these investments for the long term, some indefinitely, always allowing the power of compounding work its magic.



PUBLICATIONS

STAFF PUBLICATIONS
JULY - SEPT 2022

1. UTILIZATION OF AZADIRACHTA INDICA BIODIESEL, ETHANOL AND DIESEL BLENDS FOR DIESEL ENGINE APPLICATIONS WITH ENGINE EMISSION PROFILE,
FUEL, Vol. , no. 1, pp.12-2.005
K RAJAN., Mechanical Engineering, FACULTY OF ENGINEERING AND TECHNOLOGY


K RAJAN., Mechanical Engineering, FACULTY OF ENGINEERING AND TECHNOLOGY

Outline
Highlights
Abstract
Keywords
Nomenclature
1. Introduction
2. Materials and methods
3. Results and discussion
4. Conclusions
Declaration of Competing Interest
Acknowledgment
References

Fuel
Volume 319, 1 July 2022, 123798

Full Length Article

Utilization of Azadirachta indica biodiesel, ethanol and diesel blends for diesel engine applications with engine emission profile

T. Sathish, V. Mohanavel, M. Arunkumar, K. Rajan, Manzoore Elahi M. Soudagar, M.A. Mujtaba, Saleh H. Salmen, Sami Al Obaid, H. Fayaz, S. Sivakumar

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Fuel, Volume 319, 2022, Article 123802
Wenbin Huang, ..., Han Yang
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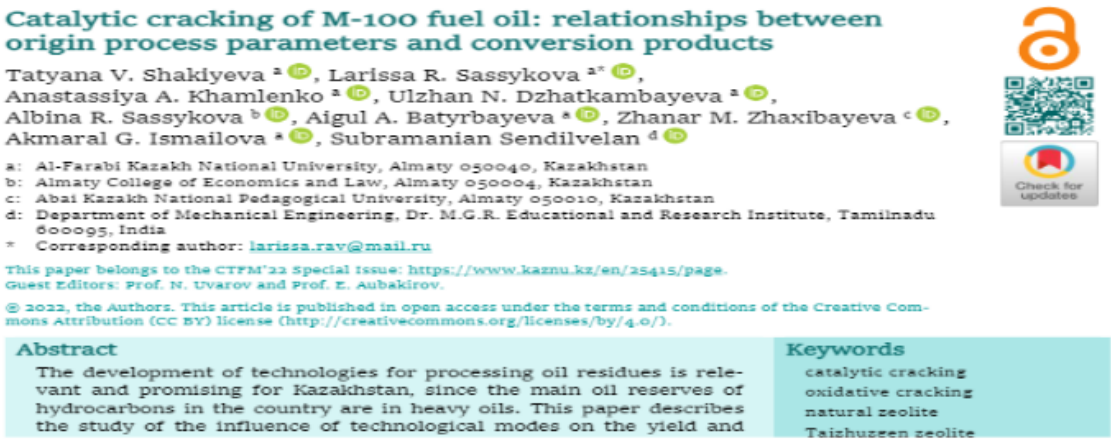
Improved surface temperature of absorber plate using metallic titanium...
Sustainable Energy Technologies and Assessments

2. CATALYTIC CRACKING OF M-100 FUEL OIL: RELATIONSHIPS BETWEEN ORIGIN PROCESS PARAMETERS AND CONVERSION PRODUCTS,
CHIMICA TECHNO ACTA, VOL. 3, NO. , PP.-0.087
S SENDILVELAN., MECHANICAL ENGINEERING, FACULTY OF ENGINEERING AND TECHNOLOGY


Catalytic cracking of M-100 fuel oil: relationships between origin process parameters and conversion products

Tatyana V. Shakiyeva [a], Larissa R. Sassykova [a*], Anastassiya A. Khamlenko [a], Ulzhan N. Dzhatkambayeva [a], Albina R. Sassykova [b], Aigul A. Batyrbayeva [a], Zhanar M. Zhaxibayeva [c], Akmaral G. Ismailova [a], Subramanian Sendilvelan [d]

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b: Almaty College of Economics and Law, Almaty 050004, Kazakhstan
c: Abai Kazakh National Pedagogical University, Almaty 050010, Kazakhstan
d: Department of Mechanical Engineering, Dr. M.G.R. Educational and Research Institute, Tamilnadu 600095, India
* Corresponding author: larissa.rav@mail.ru

This paper belongs to the CTFM'22 Special Issue: https://www.kaznu.kz/en/25415/page.
Guest Editors: Prof. N. Uvarov and Prof. E. Aubakirov.

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Abstract
The development of technologies for processing oil residues is relevant and promising for Kazakhstan, since the main oil reserves of hydrocarbons in the country are in heavy oils. This paper describes the study of the influence of technological modes on the yield and

Keywords
catalytic cracking
oxidative cracking
natural zeolite
Taizhuzgen zeolite

3. COPPER OXIDE NANOPARTICLES INCORPORATED IN THE METAL MESH USED TO ENHANCE THE HEAT TRANSFER PERFORMANCE OF THE CATALYTIC CONVERTER AND TO REDUCE EMISSION, JOURNAL OF NANOMATERIALS, Vol. , no. 1, pp.9-0.691
S SENDILVELAN., Mechanical Engineering, FACULTY OF ENGINEERING AND TECHNOLOGY

4. MECHANICAL AND MORPHOLOGICAL INVESTIGATION OF ALUMINIUM 7075 REINFORCED WITH NANO GRAPHENE / ALUMINIUM OXIDE / INCONEL ALLOY 625 USING ULTRASONIC STIR CASTING METHOD,
REVUE DES COMPOSITES ET DES MATERIAUX AVANCES, VOL. 4, NO. 181, PP.189-0.333
VIJAYAKUMAR K R., MECHANICAL ENGINEERING, FACULTY OF ENGINEERING AND TECHNOLOGY
THAYUMANAVAN MAHENDRAN., MECHANICAL ENGINEERING, FACULTY OF ENGINEERING AND TECHNOLOGY

Mechanical and Morphological Investigation of Aluminium 7075 Reinforced with Nano Graphene / Aluminium Oxide / Inconel Alloy 625 Using Ultrasonic Stir Casting Method.

- **Source:** Journal of Composite & Advanced Materials / Revue des Composites et des Matériaux Avancés . Aug2022, Vol. 32 Issue 4, p181-189. 9p.
- **Author(s):** Maheenan, Thayumanavan; Kutty Nadar Rajammal, Vijaya Kumar
- **Abstract:** Aluminium Hybrid Metal Matrix Nano Composites (AHMMNCs) are finding widespread use in the aerospace, marine, defence, and automotive industries due to its high stiffness, high strength-to-weight ratio, and outstanding wear resistance. Hybrid nano composite materials are commonly used in engineering applications due to their proper mechanical organisation. Mechanical property improvement of hybrid nano composites is now a prominent field of research in materials and industrial technology. Aluminium alloy 7075 was reinforced with 0.5, 1.5%, and 2.0 wt. percent of nanographene (20-30nm), 2,4,6,8 wt percent of aluminium oxide (50m), and 2,4,6,8 wt percent of Inconel alloy 625 and 1wt percent of magnesium utilising an ultrasonic stir casting process in this study. Mechanical characteristics of the hybrid nano-composite material were evaluated using tension, compression, hardness, and flexural tests. SEM was used for morphology inquiry examination.
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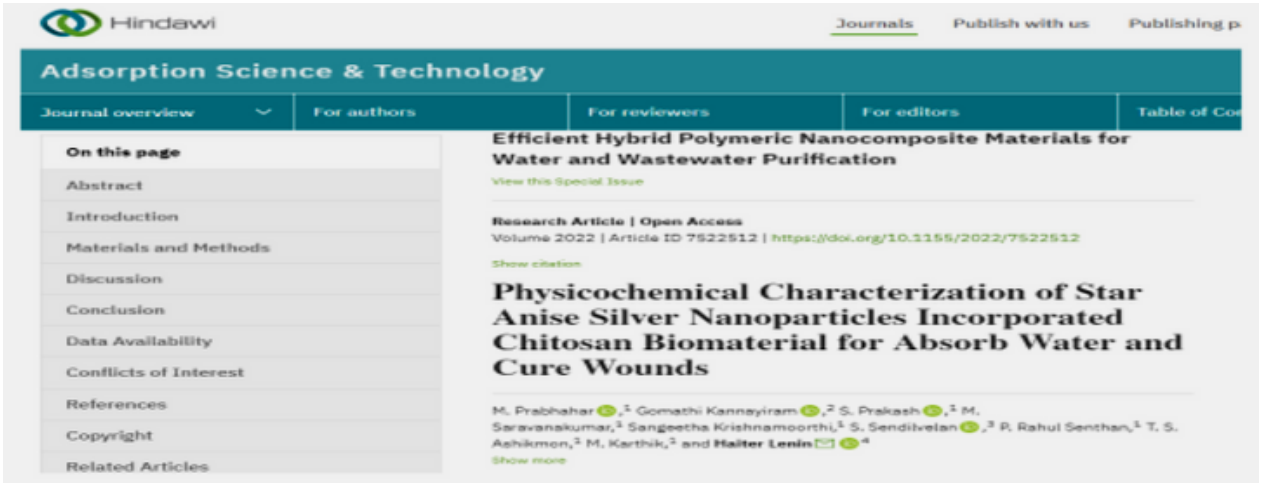

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