



## Connecting Thinkers...

### From the Pro-Vice Chancellor's Desk



1st November 2015

Dear Fellow Researchers, Greetings to each one of you! HAPPY KANNADA RAJYOTSAVA!

The month of October has been a time of celebrating festivals...and the celebrations will continue in both November and December. For us at Jain University, October was an especially hectic and fulfilling month. All of us were busy preparing for the visit of the NAAC Peer Team, which was at the University from 29 to 31 October. . Those of us working in the University Departments and Research Centres spent a good part of the month gearing up for the visit. Showcasing the research profile of the

University was an important focus as our Vision Statement clearly outlines our unequivocal commitment to quality research. In preparation for the visit, the University Faculty spent an entire day listening to the presentations by the University's dedicated Research Centres and Departments. It allowed us all to familiarize ourselves with the commendable work being done by our colleagues in domains outside our research specializations. Some of our doctoral students had an opportunity to interact with the NAAC Peer team both when they visited the Research Centres and Departments and when they had a dedicated session with the students. Many of those who secured their doctoral degrees from Jain University got a chance to interact with the Peer Team at the Alumni meeting. As a University we put our best foot forward and made sincere efforts to present our endeavours and achievements.

We are planning to continue the six-monthly review of doctoral scholars in November and December. We will focus on Management scholars in this round. We also plan a Research Retreat in February 2016. In the meanwhile, those of you who read THINKLET would note the announcements made in this issue and respond accordingly. As we end this year, let us resolve to renew with even greater vigour our commitment to our research work and focus on quality publications. All the very best!

**Dr. Sandeep Shastri**

### NEWS

Mr. Robin Kreimeyer, a representative from the St. Gallen Symposium in Switzerland will be at Jain University on 17 November 2015 to address the Doctoral, M.Phil and Post graduate students on next year's Symposium. It was at this year's Symposium that a Doctoral Student from Jain University, Ms Ashwini N.V. Ganig, was invited to participate and her idea was voted as the best idea at the conference.

We are inviting a select number of our Doctoral and M.Phil students for the interaction with the St. Gallen representative on 17th November. Those interested in taking part, please send an email to Dr Sandeep Shastri at [cersse@jainuniversity.ac.in](mailto:cersse@jainuniversity.ac.in) at the earliest.

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### Achievements

- The Youth Forum connected to the Commonwealth Heads of Government Meeting (CHOGM) has invited Ms. Devika Malik, a student of M.Phil Psychology, to participate in the prestigious meet to be held at Malta, from the 17th to 25th of November, 2015. We congratulate her on this achievement!

## GUIDE'S COLUMN

### Engineering Education at Crossroads: The Way Forward

For quite some time in India, engineering has been one of the most sought professions as it provides a multitude of opportunities to graduates. Most of the “elite graduates” receive lucrative pay packages in India and abroad. However, a majority of the graduates are considered to be average and are made to wade through difficult waters to get decent/good jobs. This may be due to lack of skills demanded by the industries in the graduates. Globalization has led to an increase on the students’ pressure to perform. They might also face a lack of confidence as they might find it difficult to connect to the various courses they study in engineering. Post acquiring a degree, they neither have the caliber to take up skilled jobs nor have the interest to accept jobs in the MSME sector. In the process, they are stranded at crossroads and have nowhere further to go. Many such graduates have turned to professions such as car driving/ pizza delivery, etc. With the Hon. Prime Minister of India promoting *Make in India*, is it possible to establish startups without the availability of skilled personnel/talent pool?

The bane of engineering education has been the non-availability of hands-on training for students and quality faculty. Quality class teaching coupled with hands-on training would have made campus life interesting. Facility creation for on-campus hands-on training would involve huge investments which would result in a fee structure which is not affordable to all aspirants. This could be overcome by formation of consortium of colleges, creation of common research facilities and sharing the same for the common good. The other important parameter to be addressed is the quality and domain of expertise of faculty. Tier2 institutions across our nation suffer both lack of facility and expertise. It is a well-known fact that most institutions offer textbook knowledge with very little to offer in terms of quality training and needless to say most of the institutions do not practice standards. There is an urgent need to train engineering faculty in various domains with a special focus on multidisciplinary domains & connect applied engineering mathematics to theory. Hence, institutions should be allowed to share their expertise. Every institution should join hands with industry/premier institutions and create a common floor to operate. This creates an eco-system to groom talent. This model would place all stakeholders on a win-win platform. With foreign universities likely to run their franchise in the near future in India, most local engineering institutions would need to seriously rethink strategies. Peripheral to the two important aspects discussed earlier, is the fact that institutions need to establish a process-driven, transparent system and provide a congenial atmosphere for research, incentives for quality performance, and accountability of faculty.

Hence, there is an urgent need to improve quality of technical education to promote *Make in India*.

**Dr. K. Gopalakrishna**

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## Digital Marketing for Women Entrepreneur Development

Women entrepreneurs play a vital role in the economic development of a country. In a patriarchal society, women have broken the metaphorical glass-ceiling and have emerged as successful entrepreneurs and have contributed to the society and also empowered themselves.

Despite their plunge in the economic activity, women face a number of barriers that hinder their development, among which marketing is a major constraint. Several studies have proved that even amongst successful women entrepreneurs, one in every five faced problems related to the market. Hence, in the present business world digital marketing plays a vital role due to its massive reach with the help of the World Wide Web and social media.

Some important digital marketing techniques for successful business are building website and search engine optimization, making websites user friendly, building business presence using social media channels like Facebook, Twitter, and LinkedIn, creating business blogs which may play a role in attracting potential businessmen and businesswomen, use of e-mail marketing tools like mail chimp, and developing mobile applications for business purposes. In modern marketing, landscape internet with social media and blogs reaches almost anyone, regardless of the business. While there exists a huge opportunity in this domain, there are also risks about which one has to be well-informed.

*Digital marketing plays a vital role due to its massive reach with the help of the World Wide Web and social media.*

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## What is Spirituality?

Defining a term such as Spirituality that has no standard definition needs some thought. While there are internationally acclaimed books available to explain spirituality, uncovering the various facets of the concept in a given cultural context is significant, as it is purely a psychological variable. A concept such as this is also gender specific.

*Seeking willingness and assuring anonymity not only upholds the ethical parameters required in conducting a research, it also puts the respondent at ease and permits them to respond without inhibitions.*

nificant, as it is purely a psychological variable. A concept such as this is also gender specific.

To have an operational definition, particularly for a term such as Spirituality, it was necessary to explore perspectives from the grass root level. To arrive at the operational definition of spirituality, twenty academicians were interviewed to learn the perception and meaning of the term. The features quoted by them about what spirituality

is encompassed self-knowledge-connect to self, higher values, principles, ideologies, righteousness, connect to God, internal development, belief to pursue life, and way to attain peace. The task of conducting in-depth interviews was exciting and challenging at the same time. When one engages in such a task, identifying the appropriate respondents, and seeking their consent by explaining the purpose and content of the research becomes important. Seeking willingness and assuring anonymity not only upholds the ethical parameters required in conducting a research, it also puts the respondent at ease and permits them to respond without inhibitions.

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## Quorum Sensing Inhibition - An alternate strategy to combat bacterial infections

Excessive and indiscriminate usage of antibiotics has resulted in Multiple Drug Resistant (MDR) bacterial strains, which has become a growing concern worldwide. Today, a global concern has emerged that the world is entering a post-antibiotic era with reduced capability to combat microbes. Due to MDR pathogens, millions of people die annually due to infectious diseases. The bacterial communities proliferate in the infectious diseases by forming biofilms. Bacterial biofilm, the matrix of Extracellular Polymeric Substance (EPS) serves as a protective function by reducing antibiotic efficiency and host immune response.

*Use of anti-quorum sensing molecules which inhibit the formation of biofilm is a promising strategy to combat bacterial infections.*

Bacterial behaviour within biofilms is regulated by a phenomenon called Quorum Sensing (QS) - a population density dependent mechanism present in many bacteria, is mediated through autoinducers (small signal molecules) which regulate the target gene expression responsible for the phenotypes essential to pathogenicity/symbiosis. *Staphylococcus aureus* and *Pseudomonas aeruginosa* are presently considered as the most drug-resistant pathogens which also form biofilms.

Biofilms have a negative effect on wound healing as it is evident by inhibition of re-epithelialization and the ability to induce keratinocyte apoptosis. Also, biofilms lead to tissue damage, further culminating to chronic wounds. In this scenario, use of anti-quorum sensing molecules which inhibit the formation of biofilm is a promising strategy to combat bacterial infections. Recent research has revealed that natural products including plant extracts have an enormous scope as therapeutic agents, which interfere with bacterial communication mechanism, thereby reducing their virulence and prevent bacterial pathogenicity.

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## My Journey in Aerospace – From ZERO to a PILOT to a PhD Scholar

I have been passionate about airplanes since my childhood. While in school when planes passed by the small village, I ran out of the class to see them. I did not know how they flew but I always dreamt of working in the domain of Aerospace. When I completed my Masters in Technology and joined Honeywell, I knew nothing about Aerospace. In the nine years of my journey with the company, I learnt everything from scratch and now I am in a position where I can address many technical issues for airliners around the world. I believe in continuous learning. This belief was the basis for utilizing the opportunity of becoming a Private Pilot which not only helped me understand Aerospace from a different perspective but also helped me climb up my learning ladder.

*The only way to learn the known unknowns is to indulge myself in research activity and hence I decided to pursue PhD.*

coming a Private Pilot which not only helped me understand Aerospace from a different perspective but also helped me climb up my learning ladder.

I love this saying: “There are things we know that we know. There are known unknowns. That is to say there are things that we now know we don't know. But there are also unknown unknowns. These are things we do not know we don't know” – Donald Rumsfeld.

The only way to learn the known unknowns is to indulge myself in research activity and hence I decided to pursue Ph.D. The design of the research coursework at Jain University is so wonderfully framed that it provides the right foundation for any research scholar in any domain. Jain University is undoubtedly a right place for my research and I am confident that this journey will bring me another step closer to my success.

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## My Journey from Macrobiology to Microbiology

After completing my post-graduation in zoology, my parents wanted me to pursue Ph. D., but doing so in zoology was not that easy since dissecting animals wasn't a simple task to do. During this period, my parents encouraged me with the following words: "You have come this far, don't give up now". I then applied to Jain University for M.Phil. in Microbiology and luckily I was admitted to the M.Phil., program. All I knew until then were scissors and forceps, but after joining CPGS, Jayanagar, it was a new experience for me to watch organisms growing on petri plates within twenty-four hours.

*I happened to meet Dr. Usha, my doctoral guide who motivated me every day. Her simple words taught me Microbiology right from its roots, and she stood by my side during the course work.*

my Ph.D. Recently I was awarded with the 'Best Poster Presentation' in a National conference held at Maharani's Science college, Bangalore. Soon, I will be completing my lab work and begin writing the synopsis for my thesis.

At this moment I wholeheartedly thank Dr. Sandeep Shastri and my guide Dr. Usha for giving me an opportunity to prove the words by Alexander the Great "There is nothing impossible to him who will try".

To quote the famous American pianist James Levine, "I was lucky that I met the right mentor and the teacher at the right moment". I happened to meet Dr. Usha, my doctoral guide who motivated me every day. Her simple words taught me Microbiology right from its roots, and she stood by my side during the course work. She made me understand every word and I am happy to say that I completed my M.Phil. with good publications and am currently pursuing

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## MEMBRANE TECHNOLOGY FOR WATER SCARCITY

“Water water everywhere

Not a drop to drink”

In the Earth's water content only 1.2 % of fresh water is available for our usage. The world water bank reports 1.6 billion people presently facing water crisis and predicts its increase to 2.8 billion by 2025. Rise in population, industrialization, urbanization and improper agricultural practices may lead to further crises with a serious impact on both its quality and quantity. In India, specifically in the metro cities, transportation, treatment and disposal of domestic, industrial and agricultural waste cause high range of water pollution. Of the total Indian water market presently being estimated as US\$ 14 billion, the industrial market is quoting about US\$ 3.5 billion. Gross waste water generation is more than 30000 million liters per day (MLD) and it is estimated to reach 83000 MLD by 2050 (India news bulletin 2010). With this scenario as an axis it is important for every Indian to seriously understand and work towards eradicating issues such as water Pollution and other related water Crises.

Water purification through process of membrane filtration is identified as a dignified, effective affordable separation technology over the past decade. The strengths of membrane technology include low energy use, no use of chemicals, with a relatively easy and well-arranged process conditions. Membrane technology is a generic term used for a variety of characteristic separation processes achieved with the use of membranes. The membrane separation process is based on the presence of semi-permeable membranes where the membrane acts as a specific filter that allows water to flow through while collecting suspended solids and other substances. Membranes are used more often to process groundwater, surface water or wastewater. Water purification through membranes is now commonly used. There are various methods to enable substances to penetrate a membrane. Examples of these methods are high pressure, maintenance of concentration gradient on both sides of the membrane and the introduction of an electric potential.

Application of membranes have now been extended to Agriculture (controlled delivery of fertilizer), Landfill Leachate, Pharmaceutical (Chiral separation, Power generation (fuel cell), Pulp and Paper (water recycle), Semiconductor, Specialty chemicals (Drug delivery), Dairy industries (Fat separation) and Textiles (Dyes separation) and Health sector (artificial kidneys for dialysis) to avoid the wastage before treating the effluents. The worldwide sales of synthetic membranes are estimated to be over US \$2 billion (in 2003). The annual growth rate for most membrane products are more than 5%, in some segments up to 12–15%. For example, the market of the by far largest commercial membrane process, the ‘artificial kidney’ (haemodialysis), represents a turnover of US \$1 billion. Hence, membrane technology has its own market in the world and it needs to facilitate the new technologies with economically feasible condition.

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## Feedback for Thinklet

*Thanks a lot for the sincere act of dispatching the newsletter issue each month. My hearty congratulations to the achievers at JU. This time too, as usual, some of the articles are very informative and the cartoons aptly depict the real plight of our research students, not necessarily of JU alone.— Dr. M.S. Raviprakash, Doctoral Guide, JU*

*Wow was the word I uttered when I completed reading the last line. The articles are very informative and lets you know what is happening elsewhere in the same family. Thank you for sharing and looking forward to the next issue.— Kiran L. Maney, Doctoral Scholar, JU*

*Thanks for sharing the wonderful thoughts with us. The articles are truly inspiring.— Hema Srinivas, Doctoral Scholar, JU*

*I got really impressed by the analysis and classification of different kinds of learners that Dr.Reetika has made. It is not only for the teachers to keep this in mind but also for all the people. Everyday we meet different kinds of people who could fall in similar category, for example a slow learner can be compared to poor listener and so on. With me everyday action is a process of learning and this includes in dealing with colleagues and rest of the world. So understanding others' capacity and views would definitely benefit in tuning our actions to success.— Sowrirajan Venugopal, Doctoral Scholar, JU*

*It contains very useful information for many research scholars and students. I particularly noted the ones on women empowerment and what I learnt in Summer School. My congratulations to the editors for their fine effort in compiling the newsletter— Prof. E. S. Dwarakadasa, Expert Member- Academic Council, JU*

*It is a pleasure reading the material presented in Thinklet. The cover is also very good. My Best Wishes to the team for their creativity.— Prof. R.S. Deshpande, Member, Board of Management, JU*

*An investment in knowledge pays the best interest.*

*- Benjamin Franklin*

## Team Thinklet

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