Aviyantaa'15

Vol. II Issue I

Yearbook of Department of Mechanical Engineering

Interview with the HOD
Dr. Hari Pd. Neopane

Cover Story:
Journey of
DoME

Art-Engineering
Workshop

Know our
Laboratories

Memoirs of
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Rendezvous with:
Ms. Bhawani Rana
Vice- President, FNCCI

Earthquake
Relief Activities

Yearly Project work
ABSTRACTS

Aviyantaa'15 Vol II Issue I Department of Mechanical Engineering, Kathmandu University 2015

Kathmandu University, Department of Mechanical Engineering
In association with Association of Mechanical Engineering Students (AMES)

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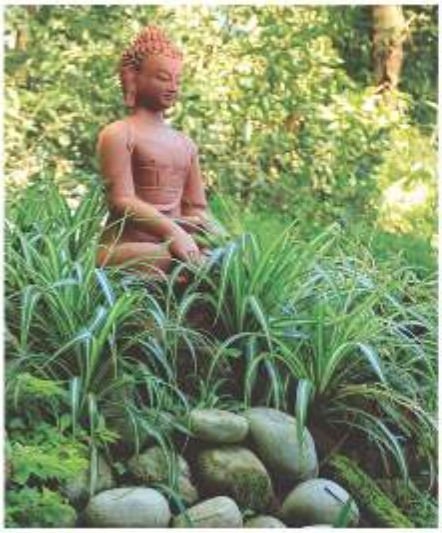

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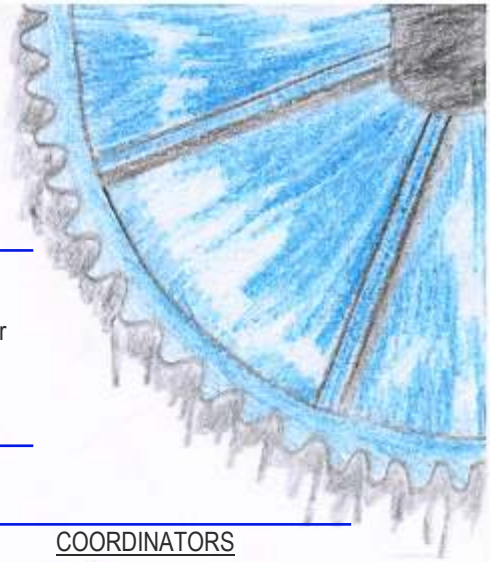
Aviyantaa'15

Yearbook of Department of Mechanical Engineering



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Mr. Anup KC, Lecturer
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Mr. Abinath Thapa (Batch 2012)

MARKETING
Mr. Sailesh Gautam (Batch 2012)
Mr. Rajendra Dhakal (Batch 2013)
Mr. Bimal Raj Khatri (Batch 2013)

On cover page:
The picture on the coverpage was taken in June 2005. During that time, Block-08 and Turbine Testing Lab (TTL) were not constructed. Seen in the picture is the high voltage lab only, apart from other KU infrastructures. As the theme of this year's Aviyantaa is Journey of DoME, we thought of using this old picture.
Picture courtesy: Mr. Anup KC

Art: Mr. Dinesh Dahal (Batch 2013)

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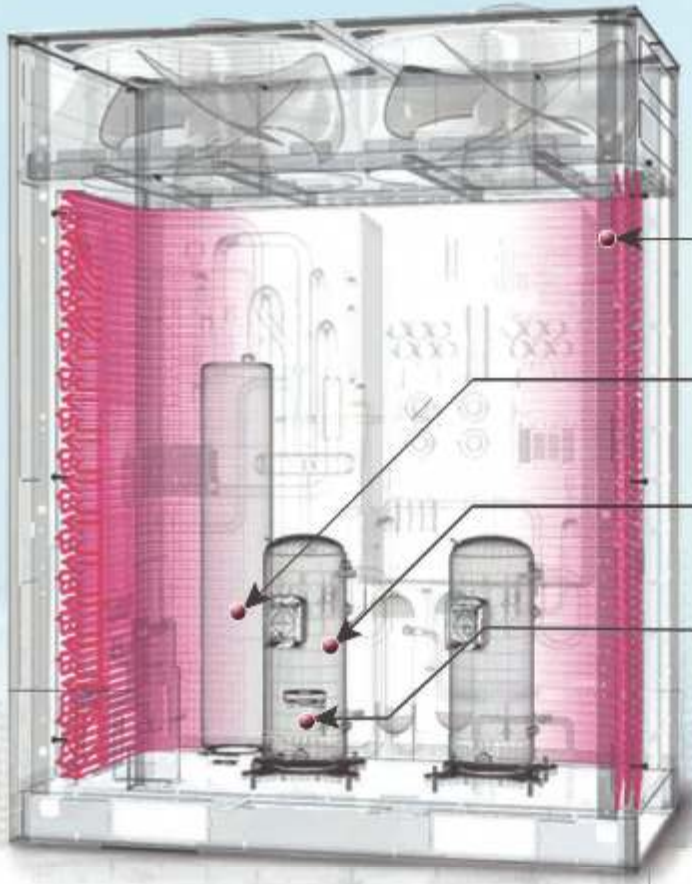

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Down the memory lane...

अभियन्ता '१४

"When we (Malesh sir, Bijendra sir, Anup sir and I) joined the department as lecturers, we were assigned the duty of project coordinators of different undergraduate years, in addition to departmental and academic workloads. Being a project coordinator, we have observed and monitored the students' project work closely and have seen them work right from inception of the project to the final presentation with praiseworthy fabrications/results. It had been quite a while since Kathmandu University Project Exhibition (KUPEX) was discontinued and we somehow felt that these project works must be demonstrated, at least for our satisfaction, that the good works of our students should be given a platform. As we deliberated on how we could organize the project exhibition, ideas crawled in that the abstracts of these projects work could be compiled in a form of compendium and the same idea was forwarded to the HoD. He opined that we could go for an Yearbook of the department that contains different aspects of departmental activities besides project abstracts.", **Pratisthit Lal Shrestha**.

Pratisthit Sir came up with the name *Yantra* but it was already taken when we googled it. He again proposed *Aviyantaa* and that is how it all began.

A month or so before, work started for Aviyantaa'14. We did not have any clue regarding the contents and designing/printing technicalities. But 3 students mustered up the courage and volunteered to do the task of publishing a magazine that was going to mark this academic feté. Bishnu, Nirajan and Priyanka would come to our office for workspace after their classes with their laptops and work silently; collecting abstracts, formatting the pages and compiling the articles. As the day for Aviyantaa'14 inched closer, they would toil hard and work late on daily basis, only to be gratified by a cup of tea and donut (each) at the *chiyapasal* outside KU gate before parting, and still continue to work late at night individually. The 1st edition of Aviyantaa was designed on MS PowerPoint. We must admit that our juvenile technical experiences might have kept us from clinging to the best possibilities, but it was an attempt they made to set a trend, to be carried on as a tradition in years to come- an initiation that should receive huge huge appreciation.

Team Aviyantaa'14

(Clockwise from top left)
Mr. Pratisthit Lal Shrestha, Mr. Anup KC,
Mr. Bishnu Dhakal,Ms. Priyanka Chauhan,
Mr. Nirajan Kumar Piya

"Pratisthit Sir and Anup Sir were of immense help regarding design of the magazine. Malesh Sir and I painstakingly edited and proofread piles of unedited abstracts, graphs and figures. Since we did not approach any sponsors and advertisers plus AMES was in short of the fund, the Department was generous enough to bear the cost of printing", **Bijendra Shrestha.**

Prof. Dr. Bim Prasad Shrestha inaugurating the project expo and Prof. Dr. Bhola Thapa releasing 1st issue of Aviyantaa

The venue for exhibition was planned in the open space/ courtyard in front of Block-8 and AMES volunteers along with other engineering students set the space ready for the event. On the D-day, i.e. 14 November 2014 morning, Dr. Bim Prasad Shrestha inaugurated the event in coordination of AMES volunteers, faculty members and students. The exhibition also coincided with the 3rd Anniversary of TTL. Amid a formal program at TTL Auditorium, PROF. Dr. Bhola Thapa released the 1st issue of Aviyantaa. The faculty members from School of Engineering, School of Science and more than 500 students from different departments attended the event making it a triumphant feté. Vice Chancellor Prof. Dr. Ram Kantha Makaju, Former VC Prof. Dr. Suresh Raj Sharma, Prof. Dr. Ramesh K. Maskey, Prof. Dr. Deepak Subedi, Prof. Dr. Jyoti Upadhyay, Prof. Dr. Kanhaiya Jha also graced the event. The event showcased the project works carried out by undergraduate students and related poster presentations.


Faculty members flipping through Aviyantaa'14 (left),
Prof. Dr. Bim P. Shrestha & VC Prof. Dr. Ram Kantha Makaju observing the projects

"This year, we have an effective team who is indentured to give its best for Aviyantaa'15. All of the members have joined their heads and hands together to come up with this Yearbook. They have compiled their initiation and diligence and bestowed their hearts upon this *magnum opus* they have undertaken. We have received an overwhelming response from our sponsors and advertisers which were mostly from the links of our ex-students, team members and faculty members. Since we have a good team to undertake the publication task and a proper fund this year, we decided to go full-color this time. We also agreed unanimously that we could go on a theme-based Yearbook- it's Pratisthit Sir's idea actually. As the department is seeing a major transformation this year by introducing B.E. in Mechanical Engineering (Subdivisions), we thought of marking the department's wonderful 21-year long journey- from genesis in 1994 A.D. to its expansion in 2015 A.D. Pragati and Kritika receives all the appreciation and pat and what not for doing the cover story so nicely", **Malesh Shah**.



Glimpses of Aviyantaa'14



Bijendra Sir was quite a help in communicating with most of the sponsors. Besides the cover story, the Yearbook contains interviews and stories related to the department and activities that occurred last year. Like the quote of Steve Jobs, the journey of Aviyantaa itself is rewarding. The team spirit and exuberance the Aviyantaa'15 team demonstrated has left us impressed and totally gratified. Kudos to Team Aviyantaa'15.

(*Based on the informal conversation with Pratisthit Sir, Malesh Sir, Bijendra Sir and Team Aviyantaa'14. Text by Anup KC*)

Contributors

Standing 6 feet-tall, **Ranjeet Kafle** (Batch 2014) aspires to become a successful automotive engineer in future and would like to earn a Ph.D as well. "I want to feel the air of highway riding on my bull. I always feel like... if only I could own a Lamborghini", he exudes confidence. He loves to tune to Narayan Gopal's soulful renditions. His favourite novels are *Tell me your Dreams* by Sidney Sheldon and *Pride and Prejudice* by Jane Austen. Good at studies, Ranjeet has made Steve Job's verse a mantra to live by- "Have the courage to follow your heart and intuition. They somehow already knew what you truly want to become. Everything else is secondary". This nerd-looking handsome guy is also pretty good at Chess and Badminton.

Gentle and soft-spoken, **Prabidhi Adhikari** (Batch 2014) has huge interest in engineering and technology, as his name suggests. He loves the serene and verdant milieu of Dhulikhel and thoroughly enjoys his student life in KU. The only son of his parents, Prabidhi wants to be a good engineer in future, live up to his parents' expecation and make them proud of him. He dotes cricket and follows most of the matches on TV. We can see him playing cricket in KU ground mostly and Hasim Amla is his favorite cricketer. Apart from cricket, he is fond of trekking, sketching and photography. His favourite music band is The Script.

With unshaven face and occasional impish smiles, **Utsavraj Aryal** (Batch 2012) is but a gentle guy. He is a big time Chelsea fan, does some poetry and has won prizes during his high school for the same. Although we could hear Phill Collins belting out from his laptop while working as designer for Aviyantaa'15, Utsav's favourite artist is Bryan Adams and regrets missing the concert of 2012, because he was not permitted to leave the hostel (while doing his +2). An avid reader, he is highly touched by Maxim Gorky's *Mother*, loves eating mo:mo, aspires to earn a Ph.D. and also become an entrepreneur in future.

Dinesh Dahal (Batch 2013) also worked as layout/designer for Aviyantaa'15. Humble and persistent, he is a quick learner and got hold of the software very fast. He can be seen playing basketball at KU's court, loves listening to *Nepathya*. Mustang is his favourite place (he went there in last year's CEP tour) and *Karnali Blues* by Buddhisagar is one of his favourite reads.

Popularly referred as PC by her peers, **Priyanka Chauhan** (Batch 2012) is a girl on fire. This witty and pretty girl is so vivacious and active in departmental activities which sometimes leave us amazed. Priyanka was also at the helm of last year's Aviyantaa. She always wanted to pursue technical education and considers ME her best decision. She possesses a good leadership trait and aspires to become a successful businesswoman in future. We also came to know that she is famous in girls' hostel for her amiable attitude and ability to gel well with anybody in the house. She recalls Ms. Bhawani Rana's interview as one of the memorable events while working for Aviyantaa. A family-person, PC's guiding force is her dear family.

Petite **Pragati Poudel** (Batch 2013) is the writer of the group (and she nailed it) as she has a good flair for writing. She ascribes her writing skills to her voracious reading habit. A bibliophile, *Sophie's World* by Jostein Gaarder is one of her favourite books. Pragati had ME as her first choice and would like to travel around the world in future. She very much likes the congenial environment in DoME and friendly nature of faculties. With an eclectic taste for music, she has The Beatles, The Doors and Queen in her playlist. Coca-cola is her favourite drink which she can drink till the end of the world. With positive attitude and ability to work under pressure, she wants to make a difference in whatever she does.

Sweet and cheerful **Kritika Bhandari** (Batch 2014) loves watching series, listening to music and reading novels. GOT and Breaking Bad are her favorite series. She wants to be a successful engineer in future. Upon asking her decision in pursuing ME, she tells with an aplomb that her gender is not a barrier to anything she wants in life. Her best experience in KU so far is the hostel life. For your kind information, Kritika is the topper of her batch!

Bishnu Dhakal (Batch 2012) has persistently worked for Aviyantaa since last edition. Perseverant, self-motivated and always eager to participate in Department's activities, Bishnu wishes to be recognized not only by academics but also by active participation and initiation in various activities, which we could not agree less. An extremely talented listener, he loves to listen to *gyan-guun ka kura* from people from all walks of life. Philanthropic by nature, he loves spending time with friends and family members. He fondly recalls his Kalinchok trip where he fell in love... with the picturesque landscape of the place. By the way, he is a swell good cook!

Nirajan Kumar Piya (Batch 2012) is the bull gear of Aviyantaa. Silent and sober, he has been relentlessly working for the various aspects of Aviyantaa. He considers working for Aviyantaa'14 as his life-time experience. Nirajan possesses good traits of management and leadership which led him shoulder the responsibility of Secretary of AIKUYN. Dedicated and passionate, he thrives by appreciation of his work. He likes to participate in different programs by managing, coordinating or volunteering them. He wants to be a trailblazer by doing something new and innovative and contribute to the society.

Bimal Raj Khatri (Batch 2013) despite Typhoid (that grounded him for 2 weeks at the expense of final exam) has actively worked for Aviyantaa'15. Shy and reticent, Khatri is quick-witted and thinks he can convince people. Nabin K. Bhattarai is his favourite artist and relishes C-mo:mo. He always wanted to study ME and got opportunity to switch faculty in second semester.

Abinath Thapa (Batch 2012) is the official photographer of Aviyantaa'15. This shutterbug is a good football player and loves doing photography with his Nikon D3100 which is also his prized possession. Dream big but relish small happiness is his philosophy of life. Cheerful, social and hard working, Abinath recalls HoD's interview as a memorable event while working for Aviyantaa'15.

The marketing ambassador of Aviyantaa'15, **Rajendra Dhakal** (Batch 2013) did his work as if it were his usual task and did not sigh and complain at all for all the hassles he went through while meeting the sponsors and media partners. Rajendra is straight-forward and defines himself as a guy with an attitude of *sidha-kura-prasta-bichar*. He very much enjoyed being in this team and gladly tells us that he was able to learn the marketing tricks and techniques to express himself and convince people while doing marketing for Aviyantaa's sponsorship. He would like to become a *desh ko sewa garne manche* in future. His hobbies are travelling and reading Nepali novels. He really loved reading *Chinaa Harayeko Manche* by Hari Bansha Dai. FYI, Rajendra is a ManCity fan. Bimal, Sailesh and Rajendra worked for marketing and collected information about different labs of DoME.

A hard-core Chelsea fan, **Sailesh Gautam** (Batch 2012) is butter-would-not-melt-in-my-mouth nice. Hailing from picturesque Palpa, he dreams of landing a job in Stamford Bridge one fine day (as an engineer, we guess :D). He digs Design and Manufacturing and would like to pursue the same field in future. Sincere and dedicated in work, Sailesh is enjoying every moments of his KU life.

Message from AMES Coordinator

Aviyantaa is undoubtedly an excellent initiation by the Association of Mechanical Engineering Students (AMES). This type of program provides the students a platform to showcase the knowledge they have acquired through their project work. Aviyantaa'14, the first ever exhibition program of Department of Mechanical Engineering was a tremendous success. I believe Aviyantaa'15 will turn out to be an even more stimulating event. As the AMES coordinator, I would like to thank Department of Mechanical Engineering for its help and support without which it would not have been possible to organize this event. I personally would like to congratulate all those who have worked hard in order to make this program a huge success. I hope that these types of programs will be continued in the years to come.

I wish the Aviyantaa'15 Team all the best for its grand success!

From the desk of HOD

It is indeed my privilege to know that Department of Mechanical Engineering, along with Association of Mechanical Engineering Students (AMES) is going to publish Aviyantaa'15; the yearbook of Department of Mechanical Engineering.

It is a great pleasure to witness such eminent quality, innovation and creativity of our students in this publication. The working team of this publication has tried as much as possible to offer the innovative ideas and fresh information of students' projects. Additionally, this issue not only increases the scope of the magazine significantly but also includes some distinct qualitative changes. The improvement in the efforts is like an ever-continuing process and also the feedbacks, suggestions and supports have always been kindly welcomed. I am sure that Aviyantaa'15 helps the readers to get a glimpse of different topics and abstract of the students' project. This also provides a platform for the students in order to showcase their endeavor and testimony to their hard work in distilling their knowledge into meaningful products and finding. I hope our students always remain creative, innovative and outstanding academically.

I take this opportunity to thank DoME faculties, staffs, AMES members and the Aviyantaa'15 team for their endless hours of work, to make this issue possible. I also thank all well-wishers of our department for their contribution and confidence over the department and AMES initiatives. It is difficult to acknowledge everyone in this short message; I observed excellent team work among all stakeholders.

Finally, I express my special appreciation and a sincere gratitude to all the sponsors who have supported us through promotional and advertising materials. Their support has made it more comfortable for us to bring out this publication.

Message from AMES President

It is really an honour to be the part of Department of Mechanical Engineering and AMES. The department has always been positive towards the improvement of students. I have found a nice platform through which I can prove and give my full effort in my field of interest. AMES has provided all the students studying under Mechanical Engineering Department a nice platform to demonstrate their talent. It has always thought to organize programs which are advantageous to students and prop up students in time of their need. Thus, considering these things AMES had organized Aviyantaa '14 as the first issue where the yearly project work of the respective batches were compiled together in compendium and a project exhibition was successfully organized. Aviyantaa is a medium through, which all the academic projects can get a good exposure. Aviyantaa has helped the students including me to show our yearly project work in front of all and spared our project work from being hoard in trash heap only. As the president, I would like to express my gratitude towards the department, Aviyantaa'15 team, sponsors and all those who are connected with this program. I also assure that AMES will always work to explore the hidden qualities of the students and provide the platform for their exposure.

Department of MECHANICAL ENGINEERING

Bachelor of Engineering in Mechanical Engineering is one of the oldest programs at the Kathmandu University and the first of its kind in the Republic of Nepal offered by the Department of Mechanical Engineering (DoME) located at Kathmandu University, Dhulikhel. Situated in the beautiful environment of Dhulikhel, DoME boasts the team of highly qualified teachers and expatriate faculties. It strives to offer the most and exposes the students to the cutting edge technology in Mechanical Engineering discipline.
Updating its laboratories with the mainstream of the technical advancement is one of the strong factors, Turbine Testing Laboratory (TTL), sophisticated CAD/CAM Lab, Solid Works, ANSYS simulation, Rapid prototyping, highly equipped automobile and mechanical workshop which are on the run are the stronger side of the department.

Mechanical Engineering is essential to a wide range of activities that includes research, design, development, manufacturing, management, and control of engineering systems, subsystems, and their components. Department of Mechanical Engineering is handling various fields of research viz. Turbine technology, Biomass gasification, improved cooking stove, Biogas generation etc. which will be beneficial for the nation in long run.

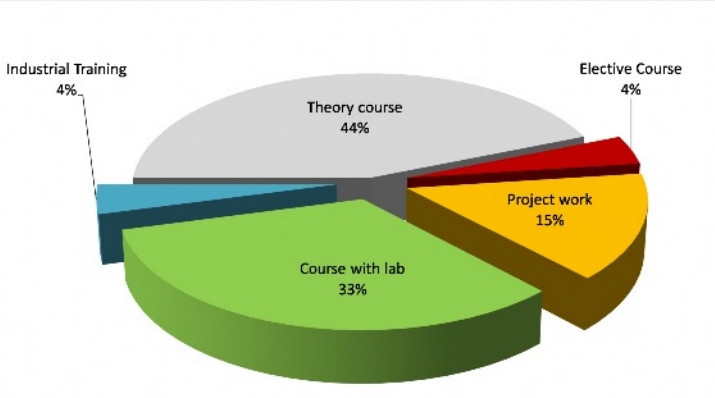
Faculty Members of DoME

the growing and flourishing DoME

the expansion of B.E. in Mechanical Engineering program with subdivisions

Growth is an integral part of any institution- to flourish and to extend its reach and services. Ever since its establishment in 1994 A.D. as one of the oldest engineering programmes in University, the Department of Mechanical Engineering (DoME) has evolved and transformed itself in many ways to keep up with the global trends and academic challenges. Having completed more than 2 decades, the popularity of the department has also increased exponentially which is underscored by the increasing number of applications for the programme during each academic year.

The establishment of Turbine Testing Lab (TTL) and formal commencement of KUTTC brought new opportunities to the department in diverse and extensive laboratory work and research activities related to hydropower, machine shop, automobile, CAD and others project activities as supported by these centres. Both the labs work autonomously and are established with the very idea that these labs will compliment the lab and research activities related to the courses at different departments and will generate the revenue for themselves. However, both of these labs are underutilized in terms of using them at full extent for the regular academic activities due to limited number of students accessing the labs and utilizing the available resources for course related activities and project works. Considering the presence of these technical and research centres mostly useful for DoME, the Department thought of maximizing the use of these labs by expanding the size of the department and channelizing its courses and lab activities to make the most use of TTL and TTC.



While KU itself has emerged as a brand in academic sphere, DoME has emerged as one of the dynamic and resourceful departments. From the academic year 2015, the department channelizes its offered courses into 4 major subdivisions- *Automobile, Design & Manufacturing, Energy Technology and Hydropower* based upon the available resources and faculty strength. This will also increase the number of intake from 60 to 120, with the vision of producing calibre graduates with specialization knowledge. This step is going to substantiate degree of the prospective students who will be graduating as a Mechanical Engineer with skill and proficiency in one of the 4 core areas.

Secondly, DoME offers different types of courses and offers an wholesome degree of Bachelor in Mechanical Engineering. While mechanical engineering itself is a vague field and it encompasses diverse fields form Automation to Manufacturing to Automobile to Aviation, Renewable Energy, Thermal Engineering and many core fields, these are bundled up in one single degree course. The department already has quite an experience in running separate Master's courses like regular master programme and funded EnPE /MPPOES.

Also, keeping up with the international practice where the Mechanical Engineering degree has undergone transformation to offering degree in specific sector, the department could segregate the mainstream courses it offers into 3-4 specializations where the courses as well as faculty members could be proportionately divided and degree could be offered with specialization. In response to this state, it will not be ambitious for the department to take this leap and expand the size of B.E. program with specialization which could address the aforementioned challenges and opportunities.

This option focused on specialization courses in Bachelor in Mechanical Engineering. The department will increase the student intake from 60 to 120. In this regard, the department will have a four sub-divisions.

- Automation and Automobile
- Design and Manufacturing
- Hydropower
- Energy Technology

This option is more interested in Bachelor level courses and in producing mechanical engineering graduates with specialization in one of the above 4 fields. As such, students seeking admission in B.E. in Mechanical Engineering need to select one of these 4 fields during the time of admission so that the department can plan and offer the related courses to the students until their graduation as B.E. in Mechanical Engineering (4 year duration). The degree offered will be B.E. in Mechanical Engineering (field of specialization). The available faculty members of the department are also segregated proportionately in these 4 sub divisions based on their degree research and expertise.

During the past 2 decades, the department has updated itself with the international courses, strengthened with physical infrastructures, channelized its academic program more into applied and research based modules from the conventional methodology. The department's paradigm shifting move can be marked by the quality and practicability of the courses, establishment of different laboratories and research activities that are carried out with acute interest and motivation, number of qualified and experienced faculty members and student-focused management.

Degree Level	Bachelor in Mechanical Engineering
Program Duration	4 Academic Years (Regular)
Credits	147 Credit Hours
Location	School of Engineering, KU Central Campus, Dhulikhel

Features of the Courses

B.E. in Mechanical Engineering (Automobile)

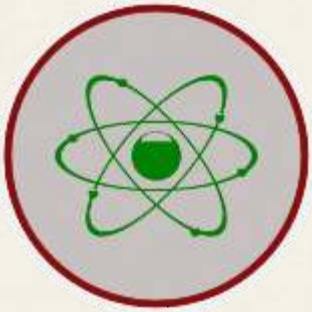
Automobile in Mechanical Engineering is synonymous with creativity and innovation to adopt modern automobile technology. With the skill ranging from mechanical design, electronic systems, manufacturing techniques and management, Automobile engineering is increasing globally in its outlook and multidisciplinary operation to learn about transport efficiency, sustainability issues and vehicle systems diagnosis. Automobile will play role in solving the energy crisis through the creation of hybrid vehicles and other related technology on a global level. Automobile looks at ways to enable vehicle to vehicle and vehicle to infrastructure communication to increase safety and security in new forms of transport. Some features of the course are design of new products and improvement of existing ones, research and development of hybrid technologies, resolving engineering problems and finding solutions to improve existing components in automobile.

B.E. in Mechanical Engineering (Design & Manufacturing)

Imagination is a one of the integral parts of human mind. But with only imagination, one cannot explain or convince the world. One has to create physical blueprints of the imagination. This is where Design & Manufacturing enters. This subdivision of Mechanical Engineering is the road map to translate one's imagination to reality. Design is the building block of all engineering sub-components. Every subject has its own type of design but the basics for all are same. This sub-component of Mechanical Engineering aims in educating students with a holistic approach of design and its manufacturing. Some of the fields that this sub-component deals with are Machine Element Design, Industrial Automation, Robotics, CAD/CAM, Ergonomics, etc. The program focuses on hands on skill development on machine element design, CAD/CAM, robotics for industrial

B.E. in Mechanical Engineering (Energy Technology)

The sub division of Energy Technology is designed to pay its part in the urgent need to change our thinking, application and energy usage pattern in regard to transforming the unsustainable exploitation of non-renewable energy resources and converting them into energy units and services. The cluster aims to re-direct our thinking and passion towards a more sustainable and holistic energy generation society, through tapping into the plentiful available alternative energy resources and transforming them through different energy technologies and applications into user friendly energy units, for mankind's holistic development and benefit. It sees mankind as part of the whole ecosystem and as the jewel of creation, with the responsibility that comes along with: How we manage the available resources in such a way that we can give a responsible account for it. The cluster aims to equip professional people with some basic knowledge of most popular energy resources, renewable energy technologies and systems, their basic technological principles, their economics and their impact on the environment and how they can be integrated into the our today's and future world energy demands and systems. The course features design of solar home system, thermal system, rural electrification, study of wind power generation and biomass energies. The course also encompasses energy management, conservation and environmental impacts of energy



B.E. in Mechanical Engineering (Hydropower)

Hydropower has always played a cardinal role in sufficing rural and urban populace with elementary lighting facilities and basic energy requirements for household. The development and growth of hydropower in Nepal has been significantly rising in recent days due to the increasing demand of electricity and establishment of newer power plants to meet the same. In addition to the larger national projects, many small scale and rural community based hydels are emerged as a boom in terms of rural electrification. The Bachelor degree program in Mechanical Engineering (Hydropower) encompasses all the basics of hydropower, the engineering behind different components, installation, maintenance and policies. The course covers fundamentals of hydropower generation, different hydro mechanical components and ancillaries of a hydropower plant, the design aspects of such mechanical equipment and hydro turbines. The course is complemented by the lab works and field visits. The course bears specialization in design and application of different hydro turbines, study of different electro mechanical and hydro mechanical components, re-feasibility in Hydropower development, energy policies, maintenance of hydropower plants.

The subdivision is designed to provide students with field specific knowledge along with common courses, However this will not occlude the students from pursuing any field of mechanical engineering in future.

Association of Mechanical Engineering Students

Established in 2002 A.D., Association of Mechanical Engineering Students (**AMES**) is a student wing of Department of Mechanical Engineering (**DoME**) that provides a platform to delve into the practical side of the contextual matters and involves in extracurricular activities through various programs that are held in the academic year. The club is moderated by the department and it conducts various programs as per the academic calendar in response to the department.

AMES conducts various academic and non- academic programs collaborating with different engineering associations, national and international organizations that create a platform to the students for their professional life. AMES is also conducting many other non-academic programs in collaboration with different clubs present within the university and with different mechanical engineering institution.

AMES occasionally organizes software training, welcome-farewell, mechanical football cup, indoor games. Besides, AMES organizes project Exhibition "Aviyantaa'14" on 18 November, 2014 A.D. aimed to give platform for the student project and helps in bridging between institution and market level. AMES is planning for weekly seminars from the expertise in the related field which helps the students for gaining extra knowledge for the future works. And such programs will again be conducted in upcoming days.

Executive Committee 2014/15

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Kailash Thapa

Vice-President
Aakashdeep Adhikari

Secretary
Bishnu Dhakal

Vice-Secretary
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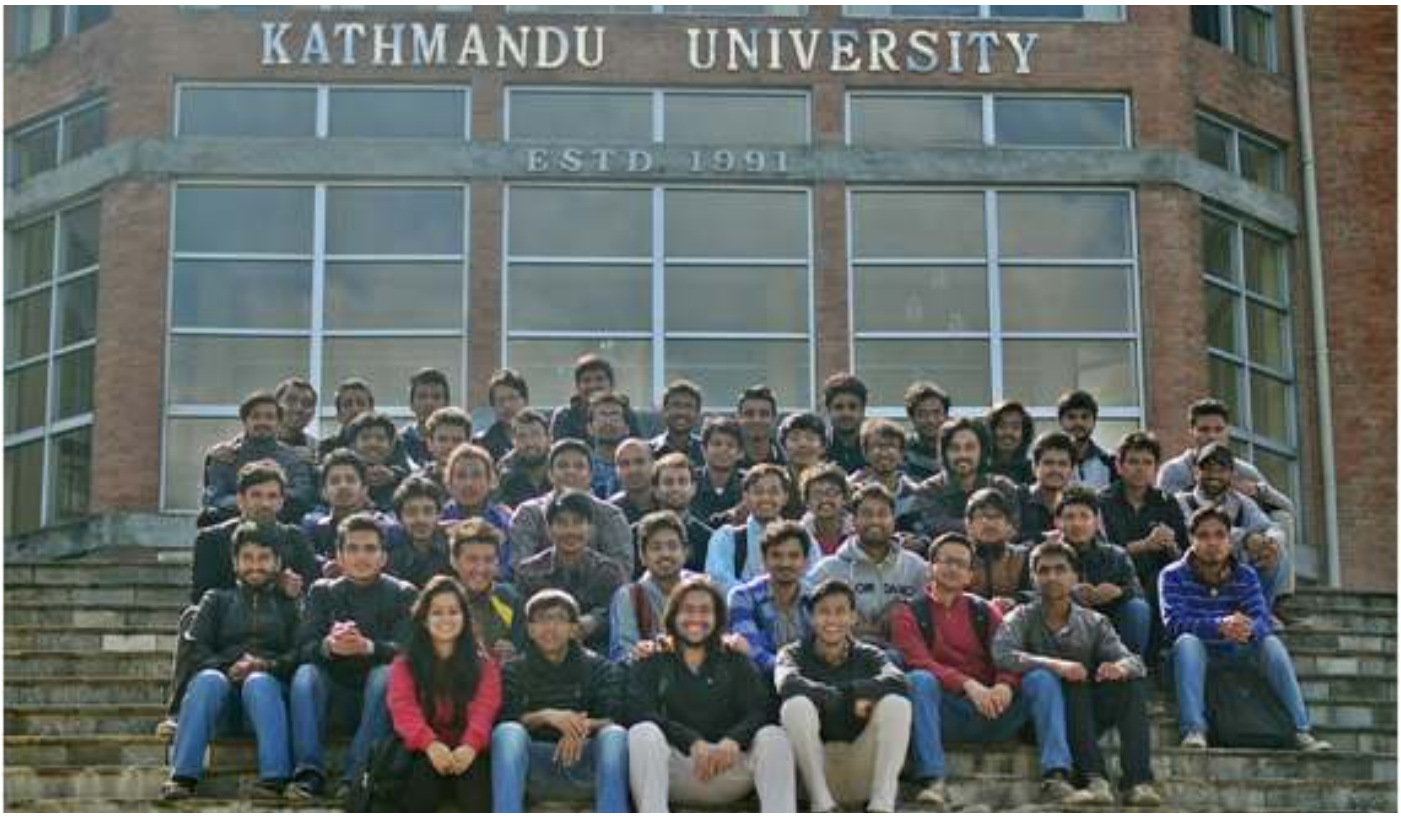

BATCH 2011 A.D.

BATCH 2012 A.D.

BATCH 2013 A.D.

BATCH 2014 A.D.

BATCH 2015 A.D.
ENERGY TECHNOLOGY AND HYDROPOWER

BATCH 2015 A.D.
AUTOMOBILE AND DESIGN & MANUFACTURING

Interview with the Achiever

Achiever of THE YOUNG SCIENTIST AWARD and SHIKSHYA PURASKAR 2015

Recipient of the coveted "Young scientist" award and the prestigious "Shikshya Puraskar", Dr. Hari Prasad Neopane is a noteworthy personality in the field of hydropower in Nepal. His contribution towards **the study of the effect of sediment erosion in hydropower turbines and optimization techniques for minimization of the effect of sediment erosion in Nepalese hydropower turbines** recognized by Nepal Academy of Science and Technology (NAST) got him the renowned title. Dr. Neopane has been shouldering the responsibility of Head of the Department of Mechanical Engineering since October 2013.Confident, perseverant and resourceful, he believes in giving 100% to any task that comes his way. **Bishnu Dhakal, Pragati Poudel & Priyanka Chauhan** indulge in a conversation with the scholar- extraordinaire.

Briefly tell us about your professional journey till today?

After completing my Bachelor Degree in Mechanical Engineering under TCS Colombo Plan Scholarship from NIT (former REC) Warangal in 2000 A.D., I joined DoME, Kathmandu University (KU) as a Teaching Assistant (TA). After one year of my service at DoME, I was promoted to Lecturer and got the opportunity for doing my Master Degree at the same department under faculty development program in 2001. That master program was the first of its kind in Nepal offered by the Department. Near to completing course work for my degree study,I got an opportunity to go to Norwegian University of Science & Technology (NTNU), Norway for my thesis work. I was awarded SINTEF Energy Research Centre Scholarship to support my study there. I resumed my service at KU after getting back in 2003. I was promoted to Assistant Professor at DoME in 2004. Again in 2007, I went to Norwegian University of Science & Technology (NTNU), Norway for my Ph.D study. My Ph.D study was supported jointly by State Education Loan Fund Scholarship for student from developing countries and Energy Norway (former EBL) research funding. I earned my Ph. D degree in 2010 and came back to KU. I have been working in the department since then in different positions. I was promoted to Associate Professor in 2011 and from October 2013 onwards, I am working as the Head at Department of Mechanical Engineering, with the different work responsibilities.

DoME is the oldest and one of the dynamic departments in School of Engineering (SoE). In your view, what factors have helped DoME stand out among other departments and other institutions?

DoME has always been guided by highly qualified, motivated and dynamic leaders since its establishment. All faculty members are versatile, active & dedicated towards their work and responsibilities. More prominently, we have always believed in teamwork and acted accordingly. The department has evolved and transformed a lot during these years, which can be attributed to our motivation for betterment and zeal to work hard and try things differently in a more realistic approach.

For any department the regular challenges are to provide congenial environment in the classroom, evaluate students in more pragmatic way, make necessary arrangements of the labs and practical works, provide students the best platform to bring out their abilities and update the curriculum to keep up with the international practices. Both Turbine Testing Lab (TTL) and KUTTC (Technical Training Centre) are of huge advantage to compliment our courses. Biomass Testing Lab and Gasification Lab are also active in new research and we are now putting in efforts to establish Solar and Thermal labs. Our classes are well furnished and we update and streamline our courses every semester. There has been a conspicuous improvement in the project works carried out by our students. Our faculty members are often engaged in different projects, which is essential for their development and improvement.

You were a faculty before shouldering the responsibility of HoD. How do you compare your roles then and now? Is it hard for a faculty with technical background to essay the role of manager as well?

Being a faculty, of course, was much easier. I had more time to give my best to teaching and research works. Being the Head has delimited my time for giving a 100% to my teaching and research work but I have also learnt a lot about the managerial techniques and team work. I have realized the importance of teamwork in accomplishment of every major and minor task related to the department or the School.

How did you feel when you heard that you were receiving the Young Scientist Award from Rt. Hon. Prime Minister of Nepal, Mr. Sushil Koirala? How did it happen- the factors that helped you achieve this prestigious award?

When I went through the criteria required for applying for this award, I saw myself as one of the strong candidates. Therefore, I filled out necessary forms and applied for it. After some time, I was asked to send in some more photos and details. I was also enquired about my schedule tentatively around the time of the award ceremony. At that time, I realized that maybe I was the one to be awarded with this prestigious title. Therefore, the news did not come to me as a sheer surprise. (He chuckles).

How do you think your achievement of these several awards will help in the journey of this department?

In order to be honoured with an award you need to work hard and contribute something to the society. The award compliments the pioneer and novel idea I introduced in my field of research. Being conferred with awards mean you have more experience in your field of research and you can also build more confidence in your subject matter. This is only possible because of good environment, teamwork and state of lab facility at the department. We can further excel findings through students, networks, and then everybody will be benefited. This will further help enhance quality education at the department and will motivate others to work in the same line.

Rt. Honourable PM Sushil Koirala conferring Young Scientist Award to Dr. Hari Prasad Neopane

Recently you have also been honoured with *Siksha Puraskar* (Education Award). How do you rate this achievement?

Young Scientist award was given to me as a recognition of my endeavour and dedication in my field of expertise [my contribution to study, investigate the effect of sediment erosion in hydropower turbines and optimisation techniques for minimization of the effect of sediment erosion in Nepalese hydropower turbines] but the *Shikshya Puraskar* marks my outstanding contribution in the education sector of Nepal. KU recommended my name among others to the Ministry of Education for this award. I feel that my relentless contribution in the education sector through KU is recognized through my work and this has made my dedication towards my work and responsibilities even mightier. I am now more motivated to commit myself in academic sector with my skills and experiences.

What do you think is the level of science and engineering in Nepal compared to other developed nations and compared to our neighbouring country?

In general, the level of science and engineering in our country is still incipient as compared to other developed nations and our neighbouring country in most of the fields. However, in some fields our level is far ahead than other nations. Some of the Nepalese researchers in some specific fields are really competent, world-renowned and have contributed significantly for the development of science and technology. Political instability and economical constraint sometimes hinder the pace & performance of the researchers. For young engineers and scientists, Nepal could be one of the world's best places for doing research and to excel their engineering knowledge by involving in through research in most of the fields.

What are your suggestions on improving the state of science and engineering in Nepal, at least at academic levels/institutions?

Research without application is just a mirage. In Nepal, we don't have good collaboration among institutes and industries. For any technical and research oriented institution, it is desideratum to have industrial partners where they can provide and support the related research activities and later on translate and launch them. We have strongly felt that and we do have some industrial partners to start off with. Many institutes do not have up-to-date curriculum based on near to realistic conditions and global trends. A person who is involved in academic field only focuses on traditional way of teaching and concentrates only on theoretical aspect of subjects. When the engineering students go to industries after their graduation, they feel difficulty in attuning themselves in industrial world due to sudden transformation from student to professional. So, both the industries and institutions must cooperate and collaborate with each other in order to create a student-friendly environment. There must be more internship, project work and case study of local industrial problems for engineering students with joint supervision. Frequent update and modification on university curriculum is needed.

Academic Roadmap of Dr. Neopane

- Date of Birth: 27 January 1975
- Doctor of Philosophy: (Ph.D) in Fluid Engineering, 2010
  Waterpower Laboratory, Department of Energy and Process Engineering from Norwegian University of Science and Technology (NTNU), Trondheim, Norway
- Master of Engineering (M.E.) in Mechanical Engineering, February 2003, Kathmandu University (KU), Nepal
- Bachelor of Technology (B. Tech.)in Mechanical Engineering, June 2000
  National Institute of Technology (NIT), Warangal, India

The department is about to witness a major change this year. What are your thoughts about this change?

DoME has always been open to changes for its betterment. We started DoME earlier with just 24 intakes, then 48, this increased to 60 and now here we are with 120 intakes, not in the same domain but with sub divisions i.e. Automobile, Design & Manufacturing, Energy Technology and Hydropower. We have done this as per the international practice where the Mechanical Engineering Degree has undergone transformation in offering degree in specific sector.

As the Head, what are your further plans for the betterment of the Department? What more changes can we expect in days to come?

To fully support and lead DoME towards the university motto "To become a world-class university devoted to bringing knowledge and technology to the service of mankind". My focus will always be improving the courses and providing the students with maximum possible knowledge and exposure so that they can be fit smoothly in the market. We are also planning to bring new programs and activities for the betterment of the students. Any activity should complement the quality of the degree and graduates.

You are a coveted personality in the field of hydropower engineering. In your opinion, in what way can DoME and its graduates contribute to the development of this sector and other areas of engineering intervention?

In the current scenario, TTL under DoME focuses on addressing the challenges faced by Nepal and overcoming them from state-of-art technologies, not only through an academic excellence, but also by prioritizing research oriented activities and projects. Among these challenges, the electricity deficit that the country is facing today has to be considered the most inevitable problem, given that the hydro-power potential is abundant. KU considers electrifying the nation through sustainable and reliable solution in highest importance. Looking into the aspects of improvements, there are many and in the context of Nepal, the pre-mature failure of the hydraulic turbines because of the rivers carrying sediments is one of the most vulnerable issues. With the subsidized policy of the Government, Nepalese manufacturers and developers have stepped into investing in micro-hydropower through local skills. However, due to the seasonal variation of the flow and operating conditions, the efficiency measurement of the turbines and the plants is of biggest problem and the only solution was to establish a lab which could test these turbines at a range of operating conditions. International collaboration was required, research and development activities were needed to be given utmost priority and testing facilities and skilled manpower were needed to develop and operate the laboratory. Also in collaboration with TTL and TTC we can organize the workshop with the entire technician of the country for better turbine manufacturing techniques and others. This can enhance the areas of engineering intervention.

Who is the inspiration behind all your success?

My family. Also every time when I get something whether it is academic honors, awards and scholarship, it gives me another inspiration whether I really deserve it or not. So I work hard and then I get another one.

What word describes you the best?

Well-disciplined, responsible individual, highly motivated, competent and dedicated to my work & responsibility.

What are your words of wisdom for aspiring Nepalese engineers who want to enter the hydropower?

Bright future.

As the Head, what message do you like to get across to your students?

Do good, be good, work hard, always face the challenge, never give up and don't underestimate your potential.

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ART--ENGINEERING

"Art without engineering is dreaming. Engineering without art is calculating."

COMPILED BY:
Prabidhi Adhikari (2014)
Pradeep Rai (2014)
Ranjeet Kafle (2014)
Kritika Bhandari (2014)

Art and Engineering collaboration plays a leading role to provide innovating, aesthetic, commercial and engineering value for "Junk-Art" through the intersection of ideas from art and engineering students, for creation of aesthetically beautiful models out of something as under-rated as junk ultimately creating a new horizon for wasted metal management and its creative use.

Department of Mechanical Engineering, Turbine Testing Lab and Technical Training Centre (Kathmandu University, School of Engineering (SoE)) in association with Centre for Art and Design (Kathmandu University, School of Arts(SoA))organized Art Engineering Workshop *Samayojan-3* for the creation of "Junk-Arts" from 9 to 15 February, 2015. For a week, the students from SoA and SoE visited the KU junkyard collecting metals and then joining them via welding or any other technique hence creating displayable models. Finally, the closing ceremony was held in Block-08, Room No. 203 on 15 February amid a formal ceremony; the event being graced by Honourable Vice Chancellor of KU, Associate Deans of SoE, Head of Departments, KU staffs and faculties.

OBJECTIVES:

The idea of Art-Engineering was put in use in 2012. The main purpose was uniting the students of different departments and schools, in interdisciplinary projects and engaging the two schools in creative activities that are important for both schools. This collaboration also focused on giving the newly admitted undergraduate students an exposure to their respective fields. It can also be taken as a sincere attempt to create an awareness on how junk can be used to create something innovative and useful.

BODY:

Engineering without arts is one dimensional and so is art without engineering. However, fusion of these two can be a rewarding and valuable model. This collaboration helps the students of both schools to be well prepared for real-world problems.

Art- Engineering workshop acts as a bridge between two distinct fields. Students develop vivid inter-personal skills, sharpen their knowledge, develop ability to cope, coordinate at any situation, develop healthy relation with peers and work accordingly; which are the governing qualities for be it an engineer or an artist. With the help of this, students will pursue convergent and complimentary interest in their fields.

The project focuses on familiarizing the students with the operation of different types of hand tools such as saw, file, ruler, scriber, protractor, hammer, chisel, etc along with the use of welding machine, grinder, and drill machine. This provides an opportunity to understand how the products are manufactured and ways to overcome the difficulties faced.

In a nutshell, art-engineering workshop allows students to experience the breadth of an art education via engineering approach.

PARTICIPANTS:

42 students from DoME and 15 students from School of Arts participated in the program. The program was supervised by Mr. Gokarna Paudel, Mr. Suman Karki, and Mr. Netra Jung Karki from KUTTC , Mr. Ravi Koirala from TTL and Mr. Gopal Kalapremi Shrestha, Mr. Bhuwan Thapa and Mr. Eric Carpenter from School of Arts.

PROCESS:

On 9th Feb 2015, the students of Mechanical Engineering-(Batch 2014) and the students of Arts (Batch 2013) were brought together to interact on the theme Art and Junkyard Engineering. The main purpose of this synergy was to invent, design, and build any reusable structure or system with improvements on junk materials.

The program formally started with the speech of Assoc. Prof. Dr. Hari Prasad Neopane, Head of Department, DoME and we were briefed on art and junkyard engineering, their relation and their history. After that, Mr. Gopal Kalapremi Shrestha from SoA shed light on Junk Art. Via him, we came to know that before 2nd world war, art only focused on positive aspects of life and were done on aesthetic materials. But after 2nd world war, the view of people changed as artists started doing artistic work on negative sides of society which imparted the idea of using scraps for art. After the briefing, we were divided into 9 groups, each consisting of 6 mechanical students and 2 arts students. On the same day, we were provided with a task to choose our project title and design plan. Then, we ransacked the junk yard and chose our design according to the materials available there.

On Day-2, with great deliberation and planning, paper design was completed. From this day, all groups started to plan their tasks to complete it within the allocated time. All students participated actively. Then, the chosen junk materials were transported to mechanical workshop for fabrication.

On Day-3, we were taught different types of manufacturing process. The mechanicals took care of the fabrication while the artists took care of design. For fabrication, we performed different manufacturing processes like casting, molding, forming, machining, joining and additive manufacturing. Metal casting involved filling a mold with molten material and solidification. Metal forming was used to induce a shape change. In machining, a manufactured part was machined to its desired geometric shaped dimensions by the removal of excess material from the work piece. It included the use of lathe drilling rule. With the knowledge and basic concept, we started with the manufacturing process.

On Day-4, materials were being casted into required shapes. As the day passed we were left with Robot legs standing in ground, Car ready to be put some outer cover, Spidocopter waiting for its spider legs, etc. On Day-5, the materials were joined together either using permanent or temporary joints. Finally, the manufactured product was joined with its parts and fabricated by the end of the day. On Day-6, all groups painted their fabricated junk art to give it a finishing touch.

The last day was the day of exhibition. We presented our junk art to guests and teachers. Honorable Vice Chancellor Prof. Dr. Ram Kantha Makaju visited and commented on our creations. All participants were given certificates and the program ended officially. With continuous seven days hard work, fabrication was completed. Throughout the project, we were guided and advised by our seniors and advisors. Finally, we were successful in manufacturing our project as per our plan with the support of KU-Department of Mechanical Engineering and Department of Arts.

CONCLUSION:

Samayojan-3 art-engineering 2015 ended successfully as per the anticipation. This project was very helpful to students from both schools. We not only learned about engineering project and arts but also understood the importance of working as a team and striking the coordination to execute the assigned task successfully. This project showed what creative outcome could be achieved when two disparate fields are brought together. The line between Art and Engineering has started to blur due to the demand of aesthetics in engineering marvels and collaboration of art by noble engineering practices.

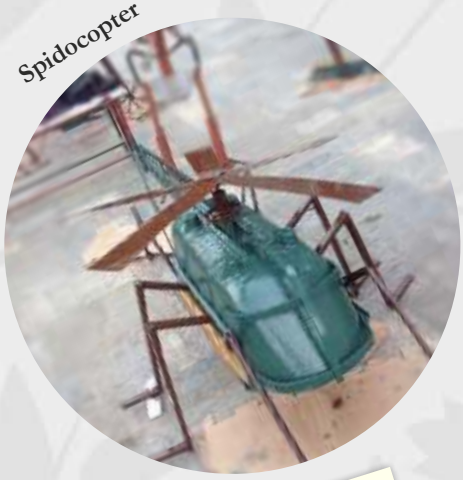
The workshop gave a good opportunity and podium to bridge the creativity between art and engineering. All the projects were fabricated technically along with artistic values. Every projects has the widest and wildest imagination in them and turned out to be a beautiful piece of art.

We would like to recommend Department of Mechanical Engineering to continue such project on years to come.

Project Title	Group Members
Spidocopter	Manup Khanal, Prabidhi Adhikari, Pradeep Rai, Ranjeet Kafle, Sanjip Pokhrel
	Neelam Bhurtel, Sarala Manandhar
Pendulum	Abhisekh Kafle, Ashish Karki, Ganesh Giri, Praceel Adhikari, Tapan Gautam
	Gaurav Dhakal, Puspa Parajuli
Chopper Bike	Anjan Kharel, Ayushman Pariyar, Nearoj Upreaty, Pratikshya Tiwari, Subrat Giri,
	Hira Bahadur, Jyoti Shreshta
HUBO 7.8	Rachan Puri, Ritesh Pathak, Kritika Bhandari, Anish Shrestha, Ishat Nepal
	Raj Kumar Rai
Birdy	Dibya Darsan Tiwari, Abhinav Aashish, Siddhartha Baral, Ashutosh Verma,Prajan Shrestha
	Yunisha Shrestha, Sambhav Maharjan
Guitar	Yuyutsu Karki, Bipendra Basnet, Aashish Adhikari, Sunil Kumar Mahato, Ram Chandra Oli, Rajan Dhital
	Raj Maharjan, Alina Manandhar
Car	Krishna Bista, Harisharan Chaulagain, Sagar Kumar Dangol, Jenish Thapa, Dibyank Singh Rajput
	Noorisha Singh, Shreya Shrestha
Ferris Wheel	Amul Dahal, Dilip Sigdel, Sanjaya Rayamajhee, Sujan Khanal, Suman Neupane
	Bishestha Dhakhwa, Barsat Jung Karki
The Light Warrior	Prashanna Bajracharya, Rajesh Dhungana, Rijan Niraula, Saurav Adhikari, Saurav Bhattarai
	Niranjan Maharjan, Rabina Lama

Batch Colour
Batch 2011
Batch 2012
Batch 2013
Batch 2014

Spidocopter



Ferris Wheel

Guitar

Chopper Bike

Birdy

Pendulum

Light Warrior

Car

Hubo 7.8

Rendezvous with the iconic entrepreneur

One of the exceptions to the stereotype that only men can compete and get triumphant in the industrial sector, Ms. Bhawani Rana is the first female Senior Vice-President of Federation of Chambers of Commerce and Industry (FNCCI). She is also the co-founder of Federation of Women Entrepreneurs Association Nepal (FWEAN) and chairperson of Sneha Group. An epitome to women entrepreneurs in Nepal, she believes that **"Economic empowerment is the key factor in development of status of women"**. A true-blue entrepreneur, Bhawani Rana has carved a niche for herself in the industrial sector and sphere of commerce and industry in Nepal. ***Pragati Poudel, Priyanka Chauhan, Nirajan Kumar Piya and Ranjeet Kafle*** get candid with Miss Rana as she talks about the current issues, challenges and resolutions in improving the private sector in Nepal.

Please tell us about your schooling and higher education.

I did my schooling from St. Mary's High School, Jawalakhel Lalitpur. After high school, I went to Isabella Thorne College, Lucknow to pursue Bachelor's degree. Then, I completed my Master's degree in Political Science from Lucknow University.

Despite majoring in Political science, you later moved on to business. What inspired you to do so?

As a child, I was always inspired to take up leadership positions. Hence I was interested in areas like politics and business where I could lead. My father, who was *Anchalades* at that time, was my greatest role model. Later on, I realized through my experience that economic empowerment was the key factor for women's development. Because of this reason I took up business industry.

What are your favorite memories when you were a child?

I studied in St. Mary's High School which had a really strict environment. Despite that, the pranks me and my friends pulled and the mischief are amongst my memories I fondly recall. The time I spent with my parents is also valuable for me from when I was a child.

What are your hobbies?

I have delight in reading autobiographies and spiritual books. Right now, I am going through 'Dying to be me' by Anita Moorjani. Side by side, I am reading a book on Indira Gandhi, the great Indian politician. Besides reading, I also enjoy dancing. I used to participate in different programs in my school and college days.

You were born in an era when women weren't involved in matters outside of their homes. Was your family in support of what you were doing?

Yes, of course because without family support one can never be in this position. I was really lucky to have a family where I was never discriminated on the basis of my gender. My mother always encouraged me to move forward in my life without considering my gender as a restriction. I was also involved in extra curricular activities like swimming, horse-riding, shooting etc. Fortunately, I was also married into a family where woman empowerment was encouraged and supported. My mother-in-law herself was the first female *Pradhan Pancha*, so she motivated and pushed me to pursue my dreams and career without hesitation. My families were always the wind under my winds in the pursuit of my dreams and aspirations.

How do you keep a balance between your personal and professional life?

Women are naturally great managers. Without the support of your family, you cannot reach the heights of your career. So, I have also managed to keep symmetry between my personal and professional life with the assistance of my family.

What challenges did you face in this field on the basis of your gender? How have you been tackling it?

I never really felt discriminated on the basis of my gender. But, obviously it was a little difficult for me because patriarchy was prevalent at that time. Women weren't much involved in business sector. Therefore, it was tad awkward for me, initially to work with only men but that wasn't an issue when time passed by. It is certainly difficult for a Nepalese woman to compete with men as equal because of the norms dominant in our society. But you need to have confidence in yourself and your convictions to move forward. I would say confidence is the major trait that has brought me to where I am.

You've been an immensely successful leader to many. Who inspired you to be a leader and not just an ordinary worker?

I feel that leadership quality is an inborn trait. As a child, I was the one to lead my group of friends- be it in numerous functions or in pranks we pulled upon others. Obviously, the environment you grow in also influences your attitude. My family was really encouraging which further complimented my aptitude for leadership.

In present days, the tourism and cottage industries have flourished in Nepal but large industries are being shut down. A large portion of manpower is being drained on a daily basis. How do you plan on tackling these problems?

Finally, the constitution of Nepal is about to be promulgated after several years of struggle. There are lots of things which have to be incorporated in the constitution regarding the private sectors as this sector still lacks in numerous aspects. We were able to enforce our suggestions in the constitution to create a business-favorable environment in the future. In order to flourish the industrial sector in Nepal, FNCCI has categorized 3 sectors (Tourism, Energy and Agro) with the best scope in the context of Nepal.

You also talked about large industries being shut down in Nepal. This is primarily due to lack of major industrial policies (like labor policies). The policies that are already present are also not being implemented due to the lack of stable government. Therefore, FNCCI is pushing the government to introduce necessary policies and implement them so as to attract foreign investments. Nepal does not have the environment conducive for business activities; therefore the youths are leaving the nation on a daily basis. This is a serious issue for a developing country like ours; hence for tackling it we have introduced the concept of rural industrialism. Nepal is rich in natural resources; each place has its own specialty. With motive of acknowledging this unique trait of Nepal, FNCCI has a program called One District One Product.

As you mentioned about FNCCI focusing on One District One Product, what is the progress so far? What are the plans in the near future?

FNCCI has also initiated One Village One Product in which we support the quality production of the particular village and also add value to the product. In One District One Product (ODOP), we target in an industrial level. Up till now, One Village One Product has been endorsed in 55 villages and 16 industries are already set up with 16 more to be added this year in accordance with ODOP.

One of the branches of FNCCI is Agro Industries Ltd. What are the challenges you have been facing regarding this sector?

Agro sector is one of the viable sectors in Nepal since ours is an agrarian society and majority of the population is engaged in agriculture. But, this sector hasn't been able to prosper because of lack of agro-favored policies. For example, the concept of contract farming isn't eminent in Nepal. Likewise, even the existing policies like 6% interest in agro sector hasn't been enforced. These are the major challenges FNCCI has been facing.

How has FNCCI been including energy sector in its projects?

FNCCI has a separate energy department. We have been lobbying the government to come up with energy-friendly policies so that foreign investment can also be welcomed in the energy sector. Energy generation is our primary concern acknowledging the problem of load shedding in Nepal.

What major challenges do you think the private sector is facing?

To start up a business in Nepal, it takes about 3-4 years and different ministries have to be approached. The coordination between different ministries is also feeble. This is a tedious process and not many foreign investors can withstand it. Therefore, things would be much easier if one window system was implemented.

How do you plan on improving the industrial sector during your tenure as a Senior Vice President?

We were successful in endorsing and incorporating our suggestions in the new constitution, which is a huge success. We are also trying to sort out more than two dozen policies still pending in the ministries. Likewise, we are also working on PPP (Private Public Projects) in collaboration with the government.

What kinds of training and programs has FNCCI been conducting? How is it beneficial to technical youths like us?

FNCCI conducts many training programs like capacity building for local chambers, trainings in district level etc. There are 16 different committees in FNCCI like women entrepreneur committee which works for the welfare of women involved in business sector, energy committee which works in energy sector etc. For the youth, FNCCI

Aviyantaa'15 team with Ms. Bhawani Rana

collaborates with NYF (Nepal Youth Foundation) and conducts various training and programs.

How can researches in academic institution reach the industries? Who can act as a best fitted moderator?

We have signed MOU with several universities including Kathmandu University. If the students are interested, they can always join FNCCI as an intern in order to understand the ways of business. We also welcome their thoughts and suggestions on different matters.

What are your takes on improving the status of women entrepreneurs?

I am also the Senior Vice President of Federation of Women Entrepreneurs in Nepal. We are driving the government in the formulation and implementation of different policies since policy is the key factor that guides the future.

How do you inspire women who are looking forward to pursue career in technical subjects?

My suggestion to all women is to set a goal while pursuing your career in a certain field. Be clear of what you are going to do next. For women involved in technical field, I advise them to intern in different industries and organizations to gain practical knowledge.

How do you compare the industrial climate in India and Nepal?

Unlike in India, the political condition of Nepal is really unstable. From the Panchayat system, we have reached democracy, but the political turmoil is still prevalent. Only after the political stability can economic empowerment is obtained which is the key factor in the developing of a nation. Therefore, we must all join hands in order to improve the political and economic condition of our nation in coming days.

What sort of experience did the recent earthquake in Nepal provide you with? How do you think it has affected the field of business and industry in Nepal?

Obviously, the devastating earthquake has had an adverse effect in industrial sector. But, it was a natural calamity and couldn't have been averted. The frequent calling on of strikes has also arisen to be a more concerning issue. We have witnessed a loss of at least 2 Billion rupees each day due to the strikes.

What words describes you the best?

Confident, positive and hard-working.

Yours motivational words for a fresh engineering graduate?

To be successful, you need to set a goal. You then should be fully devoted and work hard to reach the goal. Also, you should always have an optimistic approach towards any obstacles you may face in your life.

Your view regarding Aviyantaa'15 magazine?

Congratulations on publishing this magazine. I am also much honored to have participated in the making of this magazine. It is a really good initiative from your side and I wish you all the very best in your future endeavors.

LAB AND RESEARCH FACILITIES

TURBINE TESTING LAB

The Turbine Testing Lab (TTL) at Kathmandu University (KU) is a one-of-a-kind laboratory facility established with a vision of aiding hydropower development in Nepal through research, testing and simulation, validation and other technical support. Located at the foothill of KU at Dhulikhel, Nepal, the lab operates within the academic environment of the university and collaborates with the industries and private sectors to address technical and societal aspects of hydropower development and turbine-related issues. TTL also provides an opportunity for undergraduate students through various academic projects and internships. TTL carries out a lot of research activities regarding turbine design, development and simulations. It also provides the research platform for Masters and Ph.D.

Detailed preliminary designs of the lab were already created in 2000/2001 A.D. In 2009 A.D, an agreement was signed between KU and NORAD regarding financial support for construction of TTL. The Lab was jointly inaugurated by His Excellency Mr. Alf Arne Ramslien, Royal Norwegian Ambassador to Nepal and Prof. Suresh Raj Sharma, the then Vice Chancellor of KU on November 10, 2011.

Specifications

- 30 m open system head
- 150 m closed system head
- 500 l/s maximum flow
- 300 kW maximum testing capacity
- 300 m^3 lower reservoir
- 100 m^3 upper reservoir
- 500kg EOT Crane

CONTACT

Turbine Testing Lab

School of Engineering,Kathmandu University

Dhulikhel, Nepal

Phone:977-011-661399, 011-661511

www.ku.edu.np/ttl

Email:ttl@ku.edu.np

TECHNICAL TRAINING CENTER

Kathmandu University Technical Training Center (KUTTC) was established recently with a mission to fulfill the skilled work-force in context of advancing technologies in automobile and manufacturing sectors. KUTTC, established in 2014 with the financial and technical support from Korea International Cooperation Agency (KOICA), is running short-term technical training on Automobile, Carpentry, Welding and Machining.

MACHINE LAB

The well-equipped machine lab at KUTTC offers students, the best platform to enhance their workshop skills in manufacturing sectors. The lab includes the following machines.

- 2 Drilling Machines capable of drilling from 1 mm to 13 mm with speed range from 495 rpm to 2092 rpm.
- 5 Lathe Machines each of bed length 600 mm, 3-jaw chuck diameter 200 mm with speed range from 45 rpm to 1800 rpm.
- 2 Universal Milling Machine of table size 1100 X 280 mm^2 with vertical feed range from 60 to 3000 rpm and horizontal feed range from 895 to 1400 rpm.
- 1 surface Grinding Machine with table size 200 X 500 mm^2 and wheel size of 180 mm diameter with maximum speed of 3450 rpm.
- One Vertical CNC machine of 660 10K model.

AUTOMOBILE LAB

The Automobile lab includes variety of highly advanced educational materials and simulators capable of providing quality education in automobile sector. KUTTC also offers short term(3 months) and long term training(1 year). KUTTC consists of various automobile machines which are as follows:

- Automobile power train system structure (cut away) for educational purpose.
- 5 Engine simulators with 3 diesel and 2 petrol engine along with 16 practice engines and 5 running test engines.
- Anti lock braking simulator(1 set), Motor bike electric and electronic band (2 pieces), Automotive electric and electronic simulator board (1 piece) and Automatic electric trainer kit (2 pieces).
- Wheel balance and tyre removal (1 set), Automatic transaxel fluid changer (1 sets) and Air conditioning gas changer (1 piece).
- Movable crane of capacity 2 tons, 4 post lift and 2 post lift each of capacity 4 tons and hydraulic press of capacity 2 tons.

WELDING SHOP

Welding shop at KUTTC, with its highly advanced equipment utilizes standard welding techniques such as MIG, TIG Arc Welding and Gas cutting (Oxy-Acetylene). The Welding Shop is also capable of repairing most of the metal items. It contains following machines and equipments.

- AC SMAC machine (10 sets), Portable DC Arc Welding machine (2 sets), and Hydraulic Shearing Machine (1 set).
- Hybrid Welding machines (8 sets) of which MIG/MAG (5 sets) and TIG (3 sets).
- Oxy-Aetylene gas cutting (5 sets) and Automatic gas cutting machines (2 sets).

CARPENTRY SHOP

The carpentry section of KUTTC provides technicians, academics and students with a wide variety of carpentry services. The carpenter's shop is furnished with a wide range of equipment such as:

- 1 piece each of Table Saw. Band Saw, Scroll Saw, Sliding table panel saw, Router Machine, Auto Planer, Hollow chisel Mortiser, Spindle Sander and Wood Lathe.
- 2 pieces each of Electric chain saw, Electric circular saw, Electric Jig saw, Drilling machine, Electric pistol drill, Electric planer, Electric hand drill and Double head grinder.

GENERAL MECHANICAL WORKSHOP

Mechanical Workshop offers manufacturing, R&D and technical support to make students familiar with industry practices and help them understand the basics of working in a workshop. It is equipped with following machineries and equipment.

- 6 Lathe machine of bed length 147 cm of which 2 of them have 4 jaw chuck (diameter 70 mm) and other have 3 jaw chuck (diameter 40 mm).
- 2 Milling machine (Horizontal /Universal) Horizontal milling machine of table size 13400 mm and speed range of 50 to 700 rpm. Universal milling machine of table size 13600 mm and speed range of 35 to 1800 rpm.
- Drilling machines (2 sets) of drill range 2 to 32 mm. Welding machines (5 sets; 4 SMAW machine and 1 MIG). Shaper machine (2 pieces), Table grinder (2 pieces), Smithy shop (3 furnaces) and Bench Vice (60 pieces).

CONTACT

Technical Training Center

Kathmandu University

Phone 977-11-661399,

Fax. (011) 661443

RENEWABLE ENERGY LAB

Renewable Lab was established in 2003 A.D. with joint collaboration of KU and RIDS Nepal by Swiss Prof. Alex Zahnd. In 2004 A.D. Solar Tracking system was installed. 1 axis tracking system and 1 fix system of 300 W each are installed which has 4 panels of each 75 W. Monitoring of these 2 system is performed by data taker having 16 points. It consists of a battery-bank of 300 Amp hr and inverter having output power of 1.5 kVA, voltage 230 V based on Micro Controller Based Design, Solar Water heater of 2 types viz, Flat plate collector system and copper tube arrangement system. In near future 400 W wind turbine and automated bomb calorimeter will be installed.

It also provides community services. From 2004-2011 A.D. solar data monitoring was done in the community of Humla based on 1 axis tracking system. In addition to community projects academic project like Solar Drier is conducted.

MACHINE VISION AND METROLOGY LAB

The aim of machine vision Lab is to solve practical computer vision problems with direct application to the real world. The lab's particular excellence lies in the sub-fields of three-dimensional reconstruction and surface inspection.

Metrology Lab was established in 1997 A.D. with an aim to impart knowledge about measurement. The experiment performed in Lab are with the help of sine bar, micrometer screw gauge, vernier calliper, profilometer , depth gauge, dial indicator. The Lab helps in visualizing the student about the practical implementation of metrological experiments.

BIOMASS STOVE TESTING LAB

This Laboratory formally started its research and development activities on 2001 A.D. To carry out research more effectively and efficiently in the field of Improved Cooking Stoves, Biomass Stove Testing Lab (BSTL) has been established. The main objective was to develop improved cooking stoves for the betterment of livelihood of the inhabitants of rural areas as an institutional contribution to the society.

Several activities are being carried out at research level with direct involvement of graduates and undergraduates students on biomass energy technology, some being funded by national and international organizations, some of which have been selected and presented at National and International level seminars and conferences. Kathmandu University Department of Mechanical Engineering has collaborated with Alternative Energy Promotion Center/Energy Sector Assistance Program for selecting appropriate model of metallic stove to be disseminated under subsidy program of Government of Nepal in high hill region of Nepal form the year 2007.

HEAT TRANSFER & THERMODYNAMICS LAB

This Laboratory was also established in 1994 A.D. It consist of three different labs viz. Heat Transfer Lab, Theory of Machine Lab and Thermodynamics Lab. Different equipments are installed in this laboratory from which all three Lab experiments can be performed.

Heat Transfer Lab

Experiments:

Thermal conductivity,Parallel counter heat exchanger,Shell and Tube heat exchanger,Forced Convection,Natural convection and Emissivity.

Thermodynamics Lab

Experiments:

Viscometer, Flash/Fire point measurement and Heat Pump

Theory of Machine Lab

Experiments:

Gyroscope, Governor, Epicyclic Gear Train, Vibration and Mass Balancing

GASIFICATION LAB

Established in 2010 A.D., the Gasifier engine research lab conducts researches on renewable energy sources. The research is mainly focused on developing and evaluating energy generative systems using Bio-Fuels like wood, Agriculture by-products and bio-diesel on gasification, Biomass combustion, and internal combustion engines .It is currently carrying out the research on 1.5 to 25 kW gasifier system intended for small sized internal combustion engines .The activities performed in the lab is listed below:

- Fuel properties, selection and gasification performance testing
- Gas composition and quality measurement
- TAR minimization and analysis
- Burner design and flare analysis
- Particulate filter design to trap particulates
- Engine adaptation

CAD/CAM LAB

CAD/CAM lab was established in 1994 A.D. with the motto of concept design and development. Different software like AutoCAD, Solid works and MATLAB is used for the process design and simulation which take place in digitally integrated environment.

Different machine such as Boxford, CNC lathe and CNC milling machine are installed here. This lab has capacity of 60 computers each installed with all three software.

DRAWING HALL

Drawing is a core subject in technical field. It is taught for all engineering as well as natural science students in 1st year under joint supervision of Department of Mechanical Engineering and Department of Civil and Geomatics Engineering. Drawing hall can accommodate 60 students with individual drawing table.

COMPILED BY:

Sailesh Gautam (2012)
Rajendra Dhakal (2013)

राष्ट्रविकासका आधार, सक्षम तथा आत्मनिर्भर युवा

कुनै पनि राष्ट्रको विकासमा युवापुस्ताको महत्वपूर्ण भुमिका हुन्छ । आत्मनिर्भर तथा सक्षम युवापुस्ता नै राष्ट्रविकासका आधार हुन । युवापुस्ताको भविष्यको सुनिश्चता तथा आत्मनिर्भरताको लागि माछापुच्छे बैंकले **युवा बचत खाता** ल्याएको छ जसबाट हरेक युवाले सजिलै तथा सुरक्षित रुपमा बचत गर्न सक्नेछ तथा भविष्यमा उच्च शिक्षा तथा सामाजिक दायित्वहरु निर्वाह गर्नमा उनीहरुलाई निक्कै सहयोगी हुनेछ ।

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प्रधान कार्यालयः पो.ब.नं. ४१, नयाँ बजार, पोखरा, नेपाल
फोनः ९७७-६१-५३०९००, फ्याक्सः ९७७-६१-५३०५००

कर्पोरेट कार्यालयः एमबिएल टावर लाजिम्पाट, काठमाण्डौ
फोनः ०१-४४२८५५६, फ्याक्सः ०१-४४२८३५६

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माछापुच्छ्रे बैंक लिमिटेड

EARTHQUAKE RELIEF

Compiled by:Rishabh Thapa, Saurav Thapa, Bipendra Basnet

The earthquake on 12 Baisakh 2072, hit us hard physically, psychologically and emotionally. If we were disturbed by the first quake then we were traumatized by the aftershocks. Numerous people lost their life and thousands of people were injured. Death toll was increasing daily and people were in dire need of help. The devastation caused was humongous and shocked everyone. Even after such a chain of traumatizing events people rose and gathered to help the injured and clear the wreckage. Within the wreckage of earthquake, rose the humanity that was lost inside the concrete cities. People were desperate to help each other and make each other feel safe. This disaster was bringing out the humanity that seemed to be long lost and forgotten.

NAYA GAUN

After the devastating earthquake, the nation was traumatized and people lost their shelter. In order to help people during this difficult time and provide a shelter with safety, Department of Mechanical Engineering with the backing of KU initiated a relief program. With the support of KU, DoME provided the necessary relief materials to the residents of the villages in Acharya Gaun, Poudel Gaun and Tallo Kuttal of Ward 6, Dhulikhel municipality. With the help of the teachers of the DoME, proper structured houses were fabricated by the students; different prototypes were made by different groups of students and the most convenient houses were selected for production. Thus, the houses were categorized as Metal Truss and Bamboo houses with 17 and 10 houses made respectively. Houses were installed as per the need of the residents and tents were also provided for schools, clinics and other local communities. Installations of all the houses were done by the students who had been volunteering along with the initiative of the teachers. Kailash Kuwar, ME 4th year student who is also a local resident there was highly influential in this task with him communicating with the member of the society and maintaining a mutual relationship. The installation process was completed successfully with backing of the local folks and they highly appreciated the work done by the volunteers.

SINDHUPALCHOWK

The tremors of the earthquake was not felt anywhere more than in Sindhupalchowk areas with a massive destruction rate. Many of the aftershocks that followed the devastation have originated in this very place. Humongous casualties have been reported and much help has also arrived here. However, Sindhupalchowk is still going up and about despite the setback and the biggest contribution is of the local people who have stood up in time of need to help each other. They have struggled through the desperate times together when humanity was the most important resource needed.

One of the Sindhupalchowk residents, Gita Sanjel with her husband Shyam Sanjel and two of their sons assisted the medical team in the earthquake aftermath. To recognize their effort, SCORE(Special Commission on Relief and Education) decided to donate a shelter house to the family as a gratitude to support them. For this purpose, DoME had been assigned the task to a team of Er. Bijendra Shrestha, Lecturer, as a team leader and members Mr. Kailash Thapa, Mr. Prakash Giri, Mr. Arjun Thapa, Mr. Prabin Shrestha as active volunteers.

They were to design, construct and install the shelter house for the Sanjel family. The designing and construction were done by the members along with help from the University in the University premises and was transported to Bahunayapati, Sindhupalchowk and installed by the students themselves with some outside help. KU has also been actively involved in other volunteering areas at Sindhupalchowk and other affected regions to help and support the people and to become a helping hand to rebuild Nepal to its beautiful self that it very much is.

PULCHOWK EXHIBITION

KU called the students involved in volunteering program; to display a bamboo structured house in Pulchwok Campus under the guidance and supervision of Prof. Dr. Ramesh Kumar Maskey, Asso. Dean, School of Engineering. There was a total 5 members from ME 1st year who volunteered for this task. To increase awareness, provide people with cheaper and strong designed houses Pulchwok Campus took the initiative to this task. The students volunteered to design the house prototype so that it could be displayed on 23rd May 2015.
The design of the house was already ready; so the fabrication of the house was the part that was left. After receiving the details of the house to be fabricated at TTC lab, they started with the fabrication. The house proto-type was transported to Pulchwok along with the toilet designed during the first stage of volunteering work with the co-ordination of TTC staff. The project was displayed on the premises of Pulchwok Campus. There were large numbers of visitors present who highly praised the design presented.

Aid to Education

During the rehabilitation period after the earthquake, Kathmandu University has been very active in supporting the schools in the Kavre district. Education is the fundamental necessity for every purpose known to man and it grows more and more with time as there is a vast sea of knowledge waiting to be explored. Despite the damage suffered by the schools during the earthquake, it was vital that the students get proper education that they seek, after the devastation, in a proper safe environment. After all, it is because of the utilization of education that let us survive and thrive for existence.

Realizing the need, K.U offered aid to the secondary schools in the Kavre district by providing them with temporary class rooms and toilets to continue their school curriculum. 23 schools benefited from this volunteering work. The rooms were designed and built on a truss based system which is an effective model for earthquake resistance. 100 toilets were also distributed by the Dhulikhel Hospital to the schools and 50 more, with variation in designs, were locally distributed to the people in dire need of help.

The University team that were involved in rehabilitation work included Mr. Suman Karki, Mr. Netra Jung Karki, Mr. Gokarna Poudel and KUTTC(Technical Training Centre) team.

Community Education Project (CEP) at Kathmandu University

The Project named 'Kathmandu University Community Education Project' (KU CEP) intends to reach to the rural communities through the university outreach programme in the field of education, community development and business incubation. The project is a partnership between Kathmandu University (KU) and Himal Partner, and was started in 2010 (planning) and implemented in its pilot phase in 2011-2012. It has been further extended within the period of 2013-2016, through a widening scope of activities and geographical areas with funding through Himal Partner.

KU wishes with this project to expose the university students and faculty members to rural environment, partly to enhance the students' understanding of the rural living conditions. It wishes to enhance the student's motivation for service in rural communities after their graduation. And the long term presence of the university is also intended to benefit the local communities in terms of development of small business enterprises and community services. Such kind of services are planned and undertaken in close cooperation with local communities and partners who are already working in the target areas. At the very start, three target areas were identified (Tamakoshi, Langtang and Dolpa) for the outreach centres, through various surveys and baseline studies. CEP has been adopting different strategies every year for the effective implementation of the project. The project started with the community field visit of undergraduate second year students (electrical, mechanical and computer). The field visits were planned after the feasibility visit of the faculties of respective departments to three different targeted areas i.e. Langtang, Singati and Charikot. Then targeted areas were expanded to some of the outreach centres of Dhulikhel Hospital. In addition, to promote the multi disciplinary culture and activities, students from various schools (science, engineering and arts) were involved for different community activities. Many community based projects has been implemented so far to these different targeted areas through CEP involving more than 1000 students and some faculties.

Mr. Sushil Shrestha
Asst. Professor, DoCSE
Project Coordinator,
Community Education Project (CEP)
Kathmandu University,
Email: sushil@ku.edu.np
Project URL: www.ku.edu.np/cep

Kathmandu University Business Incubation Center (KUBIC)

Kathmandu University Business Incubation Center (KUBIC) is established in May 2014 with the financial support from Community Education Project (CEP). The main objective of KUBIC is to help promote innovative ideas within the university into a sustainable business. KUBIC is determined to provide all required facilities for the start-up and help them grow their ideas into industry. Many ongoing projects and new ideas benefiting the livelihood of rural population are be encouraged.

Vision: Knowledge transfer and creation of entrepreneurship

Mission: To help implement potential research ideas into a sustainable enterprise

KUBIC service and facilities:

-Office Space and services with basic utilities

- Regular counseling and mentoring related to candidate business

-Research and Laboratories Facility on and off University

- Preparing business Plan, financial accounting and marketing techniques

- Advise and follow up on legal registration, law and policies

-Training on Entrepreneurship and Management for professional development

-Networking with Industries and financial sector

-Help your ideas grow into a self- sustaining business

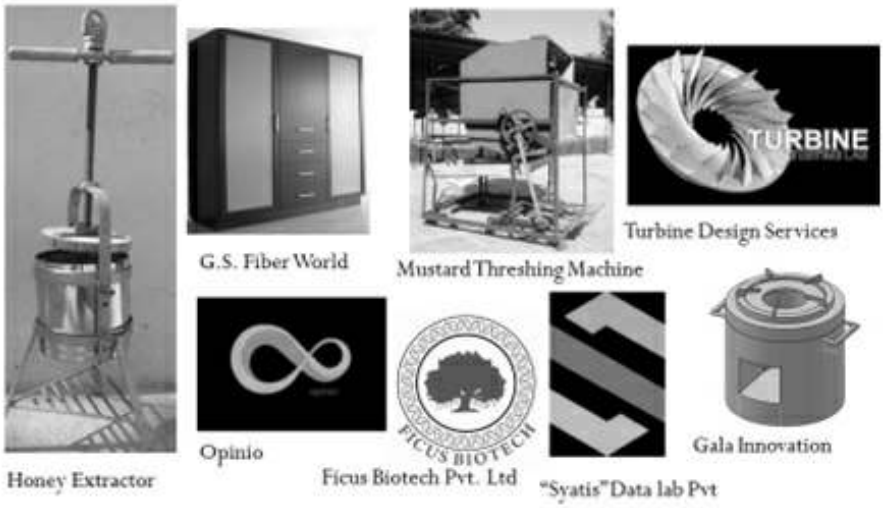

Figure 1 Ongoing Projects of KUBIC

Kathmandu University Business Incubation Center

Contact us:
Email: bic@ku.edu.np
www.ku.edu.np/kubic

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Best Wishes for the Future Endeavour.

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६ करोडको ०००००० दुकुटी

स्कराच कार्ड मार्फत न्यूनतम रू.८,००० देखि रू.१० लाख नगद उपहार*

दशैं शिपार २०७२ उपहार योजना अन्तर्गत यामाहा मोटरसाइकल तथा स्कुटरको खरिदमा पाइने स्क्राच कार्ड मार्फत जम्म ६ करोडको दुकुटी बाट सबैलाई नगद उपहार तुरन्त हात पार्ने बराबर मौकाको फाईदा लिइहोस् ।

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यो योजना यामाहाको अनुपूर्ति सेलरहरु मोटरसाइकल तथा स्कुटरहरुमा पनि उपलब्ध छ ।

यो योजना असोज ५, २०७२ देखि मिति असोजदेखि लागि आम लाइनु अगिबाटो छ । * पर्याप्त लाइनु हुनेछन् ।

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The odyssey of
DEPARTMENT OF MECHANICAL ENGINEERING

Compiled by:
Pragati Pudel (2013)
Kritika Bhandari (2014)

"Journey itself is the reward"

This quote by Steve Jobs has proven to be quite homologous to the journey of Department of Mechanical Engineering (DoME) in Kathmandu University (KU). The destination is perfection and DoME has always been on a commute to excellence. In the world of reality, perfection is next to impossible, the journey to it isn't. The individuals DoME was acquainted with, the challenges it faced and the lessons learnt are the integral part of this expedition Mechanical Engineering Department is going through. This is the guerdon, the reward which is even more ecstatic than the destination itself.

In 1993, Prof. Dr. Suresh Raj Sharma, the founder of Kathmandu University (KU) and then Vice Chancellor requested Mr. Odd Hoftun from NHAM to assist for the development of engineering programmes in KU, who then referred Prof. Inge Johansen as the suitable personnel. Prof. Johansen after visiting various institutions and meeting with related people in Kathmandu and Butwal assisted NHAM in developing a proposal for Norwegian Agency for Development Cooperation (NORAD) funding which initially provided a total fund of NOK 2.35 million for the execution of B.E. programme. In 1994, Undergraduate Programme in Engineering was formulated in close collaboration with Norwegian Institute of Science and Technology (NTNU), Norway and BITS, Pilani, India. This was the beginning of a new era that would continue its legacy to reach great heights in days to come.

Mechanical Engineering was completely a new subject at that time and a path had to be created by the founders Prof. Dr. Suresh Raj Sharma, Prof. Dr. Sitaram Adhikari and Prof. Dr. Bhadraman Tuladhar. Dr. Kai Bedringas, the first expatriate faculty from Norway and also the first Head of Department of DoME set a new track towards mechanical engineering in Nepal leaving a trail behind for others to pursue. Dr. Bedrignas was accompanied by Dr. Eldar Onsoyen, Prof. Torger Lode, Dr. Odvar Fossmark, Prof. John Kingerly Cannell who were all supported by NHAM served as faculty members in DoME. Prof. Dr. Bhola Thapa and Mr. Madan Karki were amongst the first to join KU before the commencement of formal classes. Prof. Anantarama was the dean of newly established School of Engineering (SoE). When B. E programme started at DoME, Prof. Rabindra Bhattarai, Assoc. Prof. Soma Shekhar Adiga, Mr. Yubraj Dahal, Prof. Om Bahadur Shrestha- the visiting faculty members from Tribhuvan University (TU) used to conduct lectures on Refrigeration and Air Conditioning, Machine Design, Automobile Engineering, etc. Mr. Rajadurai and Mr. Kantaraj from Manipal were also in this new family of DoME. After Prof. Kai, Prof. Dr. Bhola Thapa took charge

of the department. In 1997, Mr. Suresh Bhakta Shrestha succeeded Prof. Thapa as the department in-charge when Dr. Thapa left for his Ph. D. Mr. Dhaneshwor Mishra was the next in-charge of DoME. In 2004, Prof. Thapa after completing his Ph. D. in NTNU returned to KU and served as the HoD. In the upcoming years, he was succeeded by Prof. Dr. Bim Prasad Shrestha and Assoc. Prof. Dr. Hari Prasad Neopane. In 1998, the 1st batch of undergraduate students from DoME graduated. Marking this historical ceremony, Prof. Inge Johansen delivered the convocation speech. From the 1st batch, Mr. Anup Shrestha and Mr. Manoj Khanal joined the department in 1998 as faculty while Mr. Nilesh Man Pradhan and Dr. Bivek Baral were the students of 2nd batch to join the department in 1999 along with Mr. Suresh Gupta. In the subsequent years, among the numerous names that excelled mechanical engineering programme at KU are Rajesh Kayastha, Rajan Pokharel, Dharma Pokharel, Purusottam Kafle, Mahesh Sapkota, to name a few.

In 1999, a proposal to develop Human Resources at Master of Engineering Level in Electrical, Mechanical and Computer Engineering in Nepal was prepared by Prof. Johansen for submission for NORAD funding through co-operation between KU and NTNU. An MoU was signed in May/June 2000 between NTNU and KU. In the same year after a visit by Mr. Knut Tangen, Prof. Pal Skalle, Mr. Tom Skauge and Rita Kumar followed by feasibility study, an outline of a master programme was introduced by Mr. Knut Tangen and Prof. Inge Johansen. While general master's degree programme was introduced in DoME in the year 2001 with close supervision of Prof. A.N. Rao from Anna University, India, a Letter of Intent was signed between SINTEF and KU on 18 February 2002 for the sponsored master's degree programme.

During 2003-2004, NTNU faculty Dr. Ole Gunnar Dahlhaug spent a sabbatical year at KU during which he took some of the courses at undergraduate and post graduate levels. Meanwhile, he also initiated the activity related to efficiency measurement of hydro turbine at Jhimruk Hydropower Plant, together with KU faculties including Dr. Hari Prasad Neopane and Mr. Raju Shrestha. In tandem to this task, a feasibility study on establishment of a turbine lab was also carried out, which was to resemble Water Power Laboratory at NTNU. The Turbine Testing Lab (TTL) was established on 2011 with the close technical/ financial supervision and assistance of NTNU and other partner organizations and industries.

In 2004, CAD was introduced in the department by Mr. Mark Grundu. An employee at SOLIDWORKS, he arranged funds to install computers for design and simulation through SOLIDWORKS by providing hardware and 20 licenses to run the software. This event was a milestone for the department in transforming its conventional teaching methodology to Computer Aided Design for numerical analyses and automation. In 2007, construction of Inge Johansen Engineering Block started in Dhulikhel and was inaugurated in 2010. In 21 October 2009, Prof. Dr. Suresh Raj Sharma and His Excellency the Ambassador of Norway Mr. Thor Gislesen signed an agreement concerning the programme Renewable Nepal – a research based industrial development programme. The programme is funded by NORAD (NOK 8.6 Million) and is jointly managed by KU, Nepal and SINTEF EnergiAS (SEFAS), Norway. Similarly, Master's Programme in Planning, Operation and Energy System (MPPOES) was commenced in 2011 with joint degree of KU and NTNU. In 2013, the first ever Ph. D. candidate of SoE graduated from DoME.

In present date, DoME is one of the most dynamic departments of KU. Starting off with just 24 student intakes in 1994 A.D., the state of DoME was embellished with time by the introduction of different academic and research achievements. In 2005, the number of student intakes was twofold- to 48 students- and in 2007, the number was again increased to 60. This year i.e. the year 2015, Mechanical Engineering is introducing, for the first time, B.E. in Mechanical Engineering with subdivisions (Automobile, Design and Manufacturing, Energy Technology and Hydropower). DoME has always been successful in its ventures and we are confident that this expansion will turn out to be triumphant.

Prof. Dr. Bhola Thapa, the current registrar, is one of the oldest faculty members of DoME. During the early days of DoME's establishment, he contributed in the construction of CentralCampus in Dhulikhel by supplying dozer for excavation while working for National Construction Company Nepal (NCCN). Although he was working at a construction company, teaching was his true aspiration and his passion. He wished to pursue his dreams and thus the odyssey of this momentous man as an academician began in 1994 A.D. when he was roped in as the Lecturer at the department. He recalls his initial days at KU when DoME did not have enough labs and resources for teaching-learning activities. Most of the labs were housed at incommodious blue-roofed Sheds yet the department never failed to generate engineers excellent in quality. The department and the then faculties collected materials, tools and scraps from small companies and government agencies as grants to use them for Mechanical Engineering education. But over the period of years, the department has most sophisticated and well furnished labs of international standards. TTL, established in 2011 AD is a one-of-a-kind laboratory facility established with a vision of aiding hydropower development. The Technical Training Center (KUTTC), established in 2014 by the Korean International Cooperation Agency (KOICA) boasts sophisticated equipment, abundant machine tools and team of thorough technical staffs and officers that runs short-term technical trainings on Automobile, Motorbike, Carpentry, Welding and Machinery.

Dr. Thapa believes that the dedication of all stakeholders is the force behind growth and progress of DoME. Goodwill received from national and international partners guided Kathmandu University Mechanical Department to the current stage and is governing us towards a radiant future. When inquired about the difference of the students then and now, he exclaims that DoME has been getting better input every year. Mechanical Engineering required students who used both BRAIN and BONE in their journey to being an accomplished mechanical engineer. In light of the political instabilities and economic turmoil going on in the nation, he urges his students to use their BRAIN, BONE and HEART to serve the mankind.

KU has always been facing countless challenges since its establishment. Political instability is the major challenge Dr. Thapa remarks to have faced over the years. It has been the major hurdle for the rapid growth of not only KU but the nation as a whole. The breach between theoretical and practical knowledge is another crucial challenge the department has faced over the years. With time, a bridge in the form of different laboratories like TTL, KUTTC, Renewable Energy Lab, and CAD/CAM Lab has been created to fill the gap between theoretical and practical education. Dr. Thapa exclaims that DoME covets to redefine the teaching learning process. Like there are teaching hospitals to practice for medical students, DoME wants to build industries in its vicinity so that all

the faculties and students can exercise their profession in real world before they leave the university.

Some of the other noteworthy faculty members who made an indelible impression and contribution to DoME's aspiration are Dr. Peter Howe, Dr. Chandra Bahadur Joshi, Fulbright Scholars Dr. Yogendra Joncchhe and Prof. Gorla. Other visiting faculty members are Mr. Anup Nasnani, Dr. Dambar B. Nepali, Mr. Hari Lal Rajbahak, Dr. Santoshananda Mishara, Dr. Bon Seung Ku from Korea. Dr. John K. Cannell's remarkable contributions among many others are the establishment of now-defunct Pico Turbine Lab (adjacent to present Drawing Hall) and Solar Cool Store. TTL is the bigger and sophisticated version of this very lab. Technical officers and staffs Mr. Maheshwor Prajapati, Mr. Rajkumar Thakuri, Mr. Shyam Mahaju, Late Mr. Buddhi Bishwokarma, Late Mr. Ram Saran Thapa Magar are the technical pillars of the department who have handled the labs and workshops.

The success of DoME can be subscribed to the contributions of not only its faculty members and admins but also its students and alumni. DoME has always been blessed with both. The commendable research works and academic excellence demonstrated by its students, laudable positions carved and achieved by its graduates and their contributions in different domains have always corroborated the department's endeavor to strive for excellence. Today, the graduates of DoME have spread far and wide and have proved their mettle here and outside the country. The department has been associating itself with many renowned universities and institutions from different parts of the world- for academic, technical and research collaborations. Scholarships from many Asian and European universities, student exchange programmes, faculty exchange programmes have been quite fruitful for both the students and department fostering the academic ties between the institutions. KU has emerged as a hub for research particularly in hydro turbines which is supported by TTL. Other plentiful researches on biomass and ICS are the flagship research quests of the department. The department is also very much considerate in translating its research into applications. Places like Humla, Jumla, Singati, Rasuwa, Langtang, Milche, etc have already been privileged by the DoME's premium community-based researches and inventions.

Dr. Bim Prasad Shrestha, the former HoD of DoME has made an indefatigable endeavour in the overall progress of DoME as well as KU. He added dynamism to the accelerating department and opened new avenues for the department, its faculties and students to venture out. During his tenure as HoD, the department increased the number of students' intake from 24 to 48 and again from 48 to 60. During the time when Mechanical Engineering was the least preferred stream among the other engineering streams available at KU, the department's vision and aspiration had been instrumental in the progress of the department both in size and quality and making DoME emerge as the department of first priority within a couple of following years. During this time, Mr. Binod Raj Shiwakoti and Dr. Bivek Baral handled the responsibility of coordinator of DoME.

The journey of the DoME has been stimulating over the years. The hurdles encountered in its way, the challenges faced have been tackled in a brilliant manner. Each challenge has enlightened us, made us even more competent and most importantly has taught us to do things distinctly rather than follow a delineate path. We believe that the passage to perfection of DoME will constrict in days to come and will stand out not only in KU but in the entire nation. As only the test of fire can reveal the real nature of iron, DoME has been annealed by the trials and tribulations in this journey of 21 years and this has strengthened the department physically and academically to continue this journey of academic extravaganza. Hail Mechanical!

Words form Alumni

Mr. Paras Khadka

Current Status:
Council for Technical Educational and Vocational Training (CTEVT)
Batch: 1994-1998 A.D. (1st batch)

Experience during KU and after KU

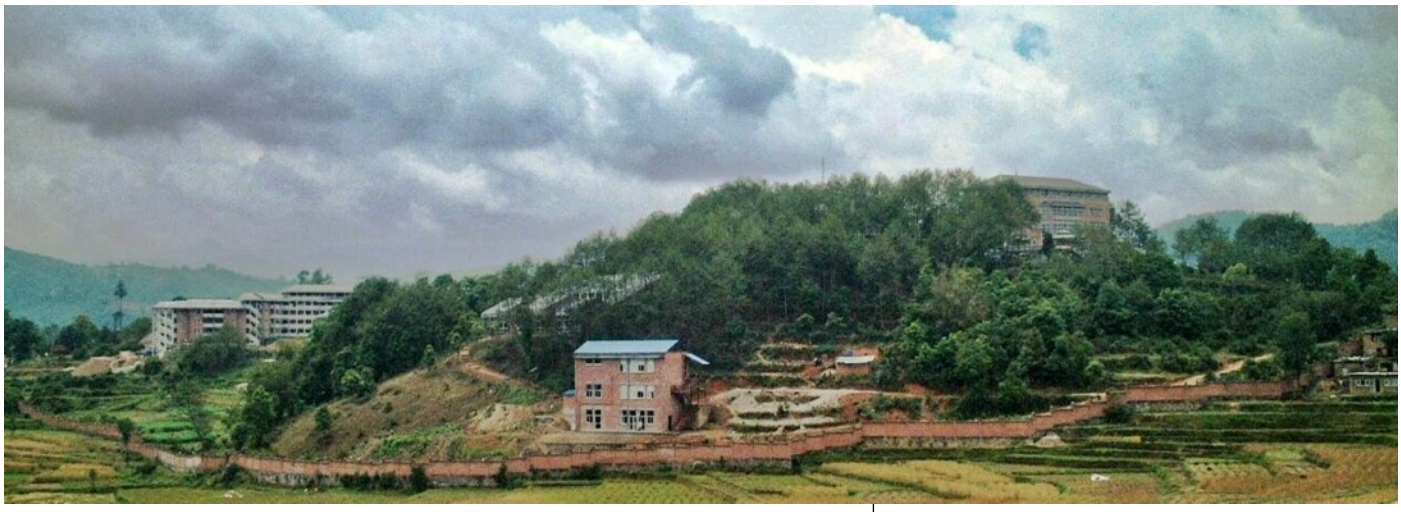
"I feel proud that I came to this university in 1994-1998 A.D. as an Undergraduate student committed to capitalize the opportunity of studying mechanical engineering and left with the satisfaction of having accomplished that goal. I was prompted by the versatility and pivotal role of mechanical engineering in modern world. My intense focus in my field of study along with the aid of the excellent environment provided by my college and lectures by eminent personalities have rendered me with a strong foundation of the concepts and the capacity to materialize them in serving people and society. Here, I could feel myself growing and kept my talents and abilities not only in the classroom but also outside classroom in activities relating to my fellow students, teachers and all types of people as well. This attitude and practice helped me develop my leadership qualities as well.

Kathmandu University envisioning *"Quality education for Leadership"* could develop in me the qualities of positive disposition, reflective way of operating, and all of the character traits that made me competent and competitive enough to execute the given responsibilities at my work context. After graduation, I started working at Council for Technical Education and Vocational Training (CTEVT) and worked for "Skills for Employment Project", an Asian Development Bank Project. In my organization, I have felt that I have always been considered as
a qualified staff to undertake new programs and projects."

Message for the upcoming graduates

"For the aspiring candidates, I would like to advice that you should first assess and identify your own interests, dreams, hopes and aspirations. If all these guide you towards technical Education, studying Mechanical Engineering would be your right decision since it offers you various options among which you can specialize in either of these areas: Design, Hydropower and Energy, Production and Manufacturing, etc."

Blast from the PAST



View of KU premise, back in 2005. Seen in the picture is High Voltage Lab apart from other infrastructures. The space beside High Voltage Lab now boasts TTL and Inge Johansen Block

Second Batch(1995 A.D.) of Mechanical Engineering at Kathmandu University, Dhulikhel, Nepal.
Photo taken at Tundikhel Ground, Dhulikhel while they were at 1st Year.

Fourth Batch(1997 A.D.) of Mechanical Engineering at Kathmandu University, Dhulikhel, Nepal.
Photo taken with John Kingerly Cannell at Library Block.

Fifth Batch(1998 A.D.) of Mechanical Engineering at Kathmandu University, Dhulikhel, Nepal.

Photo taken with incharge Suresh Bhakta Shrestha and John Kingerly Cannell at Kathmandu University Playground.

Aviyantaa'15

Timeline

DEPARTMENT

HOD'S OF MECHANICAL DEPARTMENT (In Order)

- KAI BEDRINGAS
- BHOLA THAPA (Incharge)
- SURESH BHAKTA SHRESTHA (Incharge)
- DHANESHWOR MISHRA (Incharge)
- BHOLA THAPA
- BIM PRASAD SHRESTHA
- HARI PRASAD NEOPANE (Current)

OF MECHANICAL ENGINEERING

Congratulations Message!!!

Congratulations to Editorial Board of **Team Aviyantaa**
for launching the
2nd Version of Yearbook of Mechanical Department,

"अभियन्ता'१५"

Best Wishes for the Future Endeavour.

TECHNIKA
INTERNATIONAL

Anil Shrestha
Technika International Trade Concern Pvt. Ltd.
Tripureshwor, Kathmandu, Nepal
9851139989
Email: techintl@yahoo.com

DEVELOPMENT OF A SCALED DOWN WIND TURBINE FOR WIND TUNNEL TESTING

Group Members: Amit Sharma Bhandari, Bibek Bhurtel, Bhaskar Upadhyay Aryal

Email: aryalbhaskar@gmail.com

Supervisors: Mr. Sailesh Chitrakar, Research Fellow, TTL

Mr. Binaya Baidar, Research Fellow, TTL

Total Cost: Rs. 12,000/-

Abstract:

Wind energy is one of the most abundant renewable natural resource as alternative to scarce fossil fuels and as a solution to the growing energy demand. It is clean, renewable, widely distributed and has no greenhouse gas emissions. Wind turbines can best examplify the extraction of energy from wind. The wind turbine industry has yet to sprout in the Nepali market and it has a lot of potential in Nepal. In this work, wind turbine rotor at arbitrary conditions using QBlade was designed, modeled, optimized and then scaled down to develop an experimental setup to perform wind tunnel tests in the wind tunnel available at Fluid Laboratory of Kathmandu University. The experimental results were used to make comparative study with computational and theoretical predictions at different wind velocities. The wind turbine's experimental efficiency was 0.32 and it responded best at 400 mm placement in the wind tunnel test section. The results also show that theoretical and computational power prediction are higher than experimental results owing to experimental errors and instrument inefficiencies.

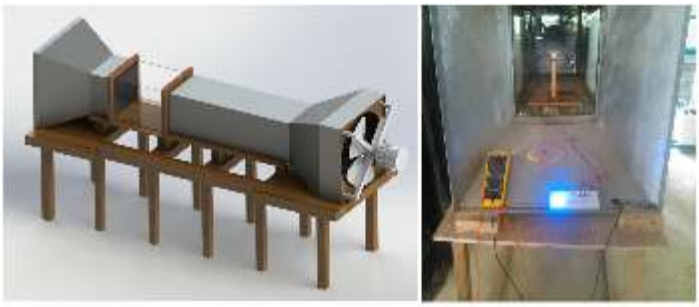


Figure 1 Wind Tunnel Development and Testing

Figure 2 Blade Development

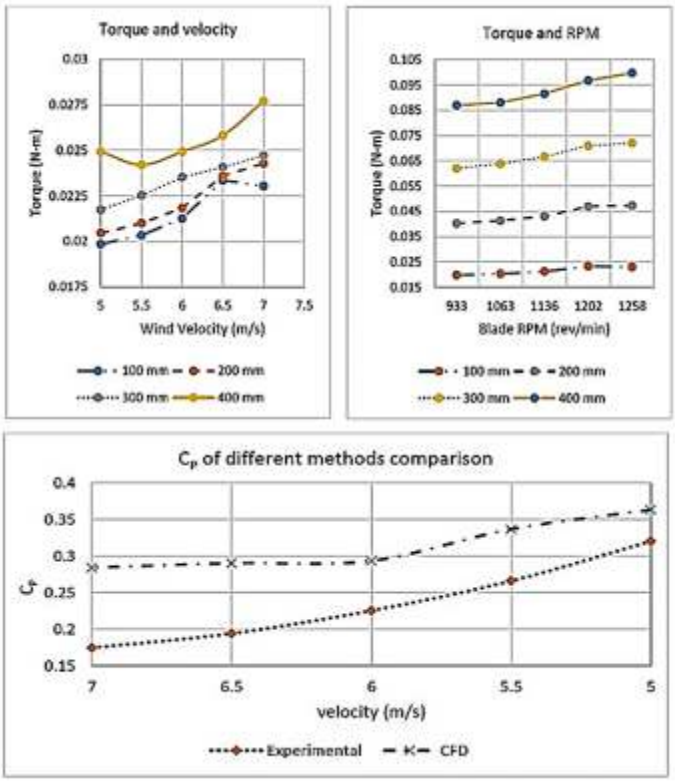


Figure 3 Torque and C_P Graph

DESIGN AND ANALYSIS OF AIR DISTRIBUTORS AND BED MATERIALS OF FLUIDIZED BED BOILER

Group Members: Ishan Kafle, Lokesh Paudel, Sajesh Bhochhibhoya

Email: 7Sajesh@gmail.com

Supervisor: Mr. Pratisthit Lal Shrestha, Lecturer

Abstract:

The project deals with the design and analysis of the wind box and bed material required for fluidized bed boiler. The design parameters (diameter of the bed particle, range of the terminal velocities, minimum fluidization velocities, maximum amplitude and steady velocities) have been calculated using Microsoft Excel by interpreting and solving various formulas. Best bed material has been selected on the basis of their various characteristics like porosity, adhesive or cohesive properties etc. An important characteristic change of air distributor velocity with combustion chamber temperature has been established. ANSYS Static Structural Solver was used to carry out strength analysis of the designed wind box. Commutational Fluid Dynamics was carried out using ANSYS FLUENT solver. Air flow inside the wind box and fluidization phenomena was verified using ANSYS FLUENT. Sand of 385 microns diameter has been selected as bed material place over a wind box of 850 mm X 420 mm area. There are 233 air distributors and 1398 orifices. The fluidization process occurs and was verified using ANSYS FLUENT.

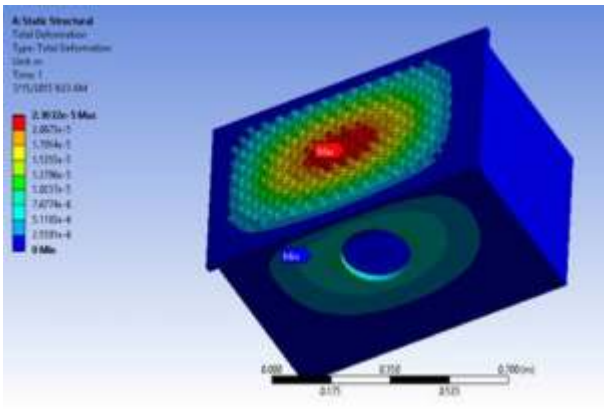


Figure 1 Deformation of Wind-Box

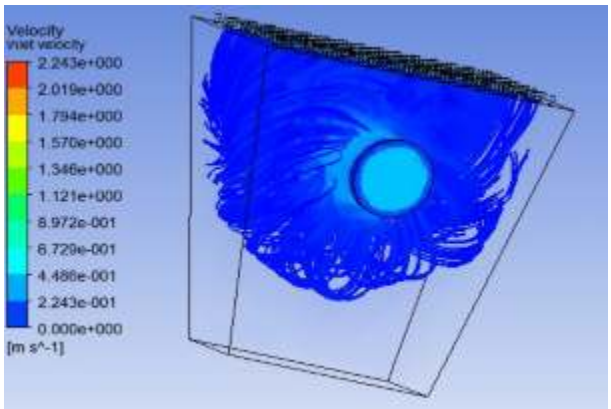


Figure 2 Streamlines in Wind-Box

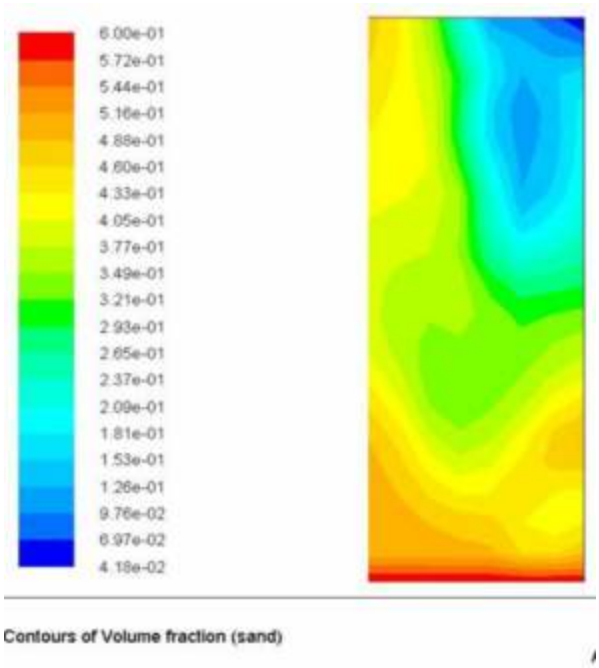


Figure 3 Fluidization of Sand Particle

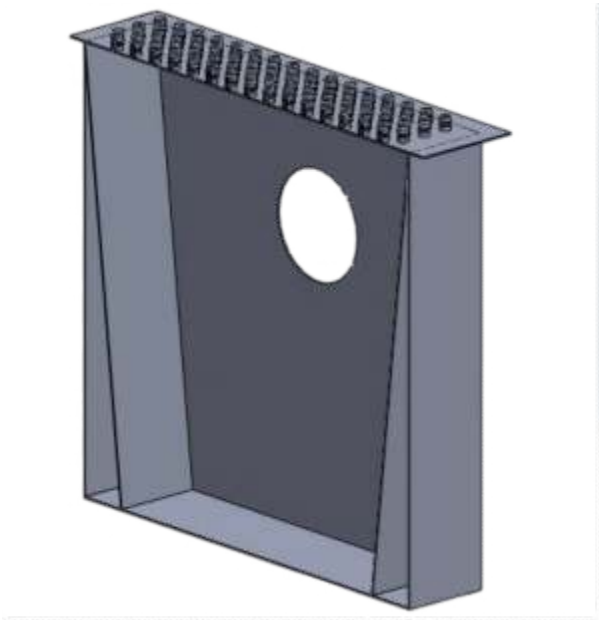


Figure 4 Sectional View of Wind-Box

DESIGN AND DEVELOPMENT OF HEXACOPTER (KU–COPTER)

Group Members: Ravi Poudel, Saurav Pathak, Sujan Bhandari

Email: pth.saurav010@gmail.com

Supervisor: Dr. Ramesh Kumar Maskey, Professor (Department of Civil and Geomatics Engineering)

Total Cost: Rs. 92,000/-

Abstract:

Unmanned Aerial Vehicle (UAV) is a flying robot capable of flying without on board pilot and controlled either manually or autonomously. It is an emerging technology for developing countries like Nepal and could be applied for various applications like aerial surveillance, photogrammetry, delivery applications and many more. Use of big manned helicopters and other aerial vehicles could be replaced for some applications by UAVs making those applications really cheap and easy. This would definitely be advantageous when being concerned about economy and cost of operation of the aerial vehicles. For purposes like disaster scouting, supplying medical aids and disaster management UAVs could prove themselves far worthy and economical. There are different types and designs (Multi rotors and fixed wings) of UAVs available in market but not easily available in context of Nepal. The UAV designed and developed by us is called KU-COPTER which is a multi rotor with six propellers (technically called as hexacopter). It can vertically take-off and land and the purpose is to take aerial photographs for photogrammetric applications and also further develop it so as to support purpose of disaster management by supplying medical aid. Since the scope of Unmanned Aerial Vehicle (UAV) is wide, so its development will pave a path for the university in exploring various applications in the context of our country and provide basis for further modification and features addition according to the area of application.

Figure 1 CAD Model of UAV (Hexacopter)

Figure 2 Flight Test of The Model

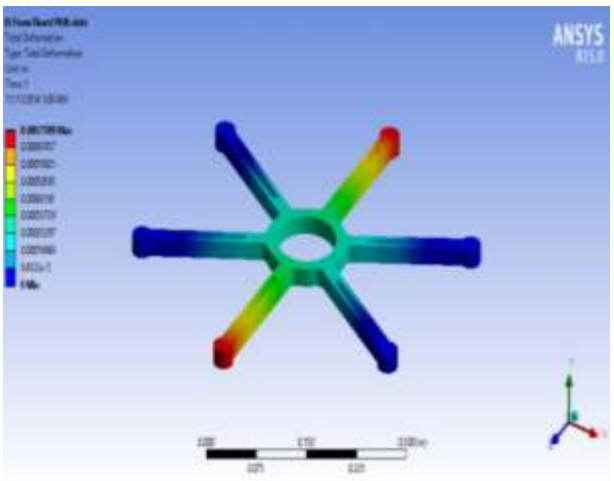


Figure 3 Structural Simulation of Model Frame on Foam Board Frame

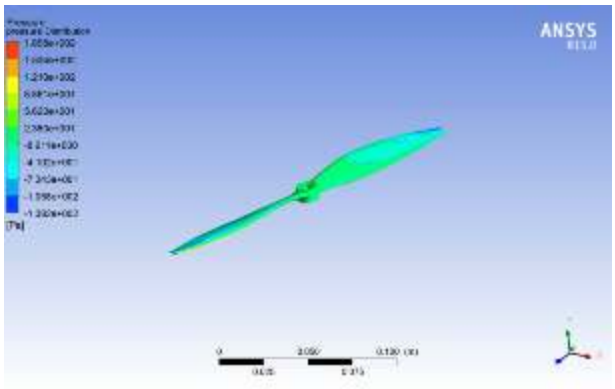


Figure 4 CFD of The Model Propeller

STUDY OF AERODYNAMIC PERFORMANCE OF NACA AIRFOIL USING DIFFERENT SOLVERS

Group Members: Bhawani Shankar Chaulagain, Prajwal Sapkota, Pradip Shrestha

Email: sapkota.prajwal@gmail.com

Supervisors: Dr. Hari Prasad Neopane, Assoc. Professor

Mr. Binaya Baidar, Research Fellow, TTL

Mr. Sailesh Chitrakar, Research Fellow, TTL

Abstract:

The work discusses about the study of aerodynamic performance of NACA 4415 airfoil by using the two major solvers i.e. ANSYS CFX and ANSYS FLUENT. The study comprises the numerical analysis at different angle of attacks at Reynolds number of one million. The result obtained from these solvers has been compared with experimental data for further validation of the data. The project utilizes the knowledge of fluid mechanics, aerodynamics and computational techniques which can be useful for the comparison of different airfoils at different conditions.

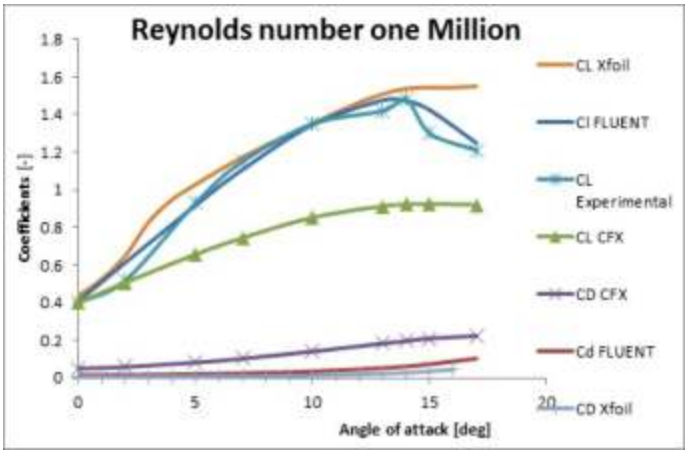


Figure 1 Coefficient of Lift, Coefficient of Drag and Coefficients for Reynold's Number One Million

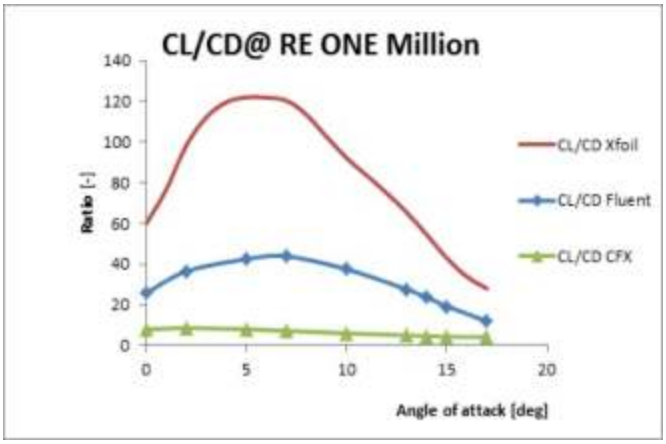


Figure 2 Coefficient of Lift, Coefficient of Drag Ratio from Different Solvers

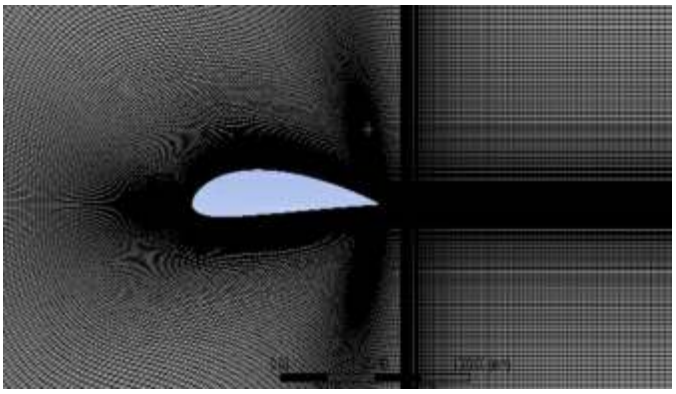


Figure 3 Grid Discretization

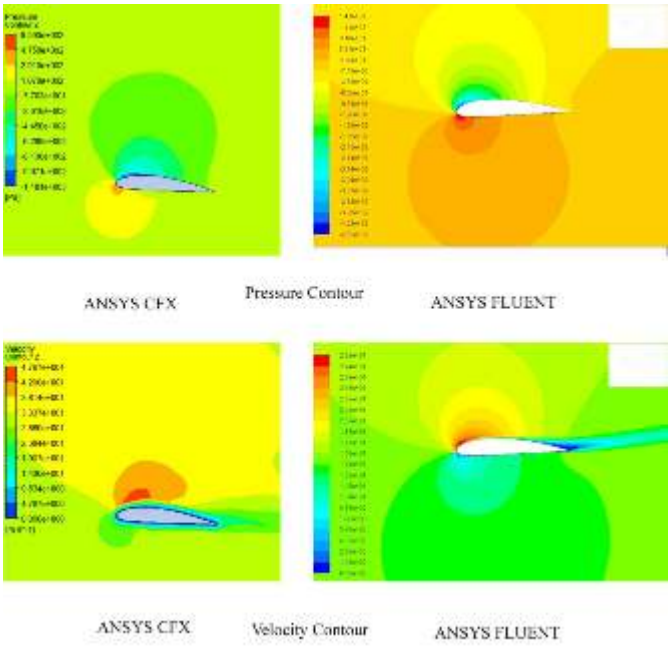


Figure 4 Pressure and Velocity Contours at 13 Degree Angle of Attack

COMPUTATIONAL ANALYSIS OF GUIDE VANE

Group Members: Keshab M.C., Rahul Adhikari, Saroj Dangal

Email: rahulvinda@gmail.com

Supervisors: Dr. Bhola Thapa, Professor

Mr. K.P. Shrestha, Asst. Professor

Mr. Ravi Koirala, Research Fellow, TTL

Abstract:

Many new hydro power plants are being built in the regions where rivers are heavily loaded with sediments. This induces material erosion in hydro turbines, leading to change in flow pattern, losses in efficiency, vibrations and even final breakdown of turbine components. Change in velocity profile and pressure counter at the inlet causes additional erosion damage and other undesired effects in the turbine runner. This work explores Computational Fluid Dynamics simulation, geometry selection for flow control blades and the design criteria of the Guide Vane. The work mainly emphasizes on the use of the 92 kW Francis turbine available at Turbine Testing Lab in Kathmandu University which guide vane has the profile of NACA 0015. Moreover, the work explores the simulation result on the guide vane from its full closing angle 0º to its full opening angle 19.1º and finds the optimum angle in which both the pressure and the velocity is uniform on both suction side and pressure side. The effect on the pressure counter and velocity distribution as well as the head loss due to the different clearance gap on the optimum is explained.

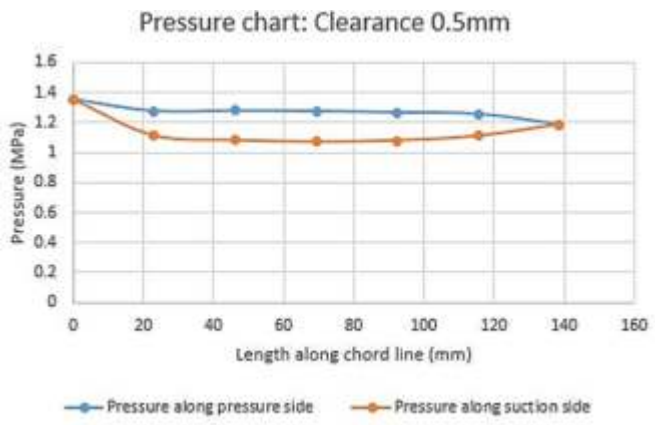


Figure 1 Pressure Distribution at Clearance Gap 0.5 mm at Opening Angle 12.5º

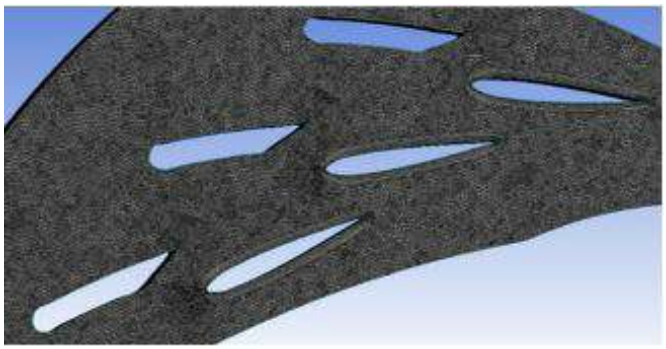


Figure 2 Mesh Created in CFD

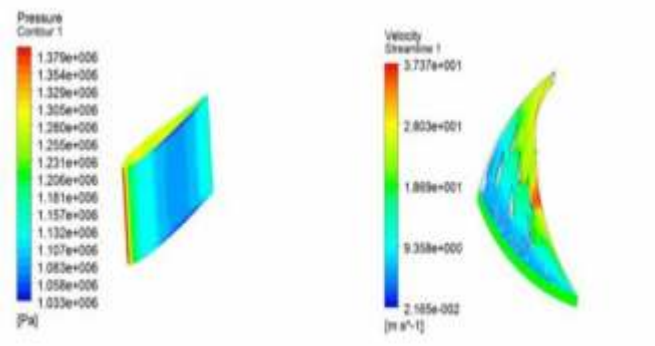


Figure 3 Pressure and Velocity Counter at Clearance Gap 0.5 mm at Opening Angle 12.5º

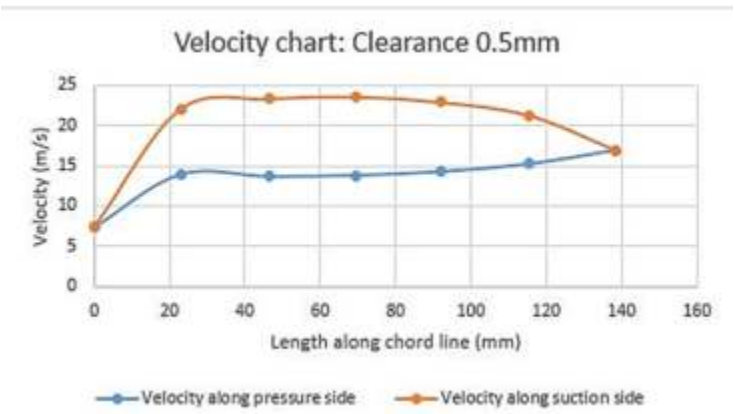


Figure 4 Velocity Distribution at Clearance Gap 0.5 mm at Opening Angle 12.5º

STUDY OF VIBRATIONAL CHARACTERISTICS OF 1.6 kW REVERSIBLE PUMP TURBINE

Group Members: Kiran Giri, Ravi Pandey, Sudarshan Bartaula

Email: ravi.mechanicku@gmail.com

Supervisors: Mr. Binaya Baidar, Research Fellow, TTL

Mr. Sailesh Chitrakar, Research Fellow, TTL

Abstract:

The work focuses on the study and experimental analysis of vibration characteristics of the Reversible Pump Turbine (RPT) installed at Turbine Testing Lab (TTL)at Kathmandu University. RPT is a machine that can operate in three modes of operation i.e. in pumping mode, turbine mode and phase compensating mode. The changes in mode during the operation of RPT create instabilities during start-up and severe water hammer pressure which creates vibration impact on the system. The natural frequency and critical speeds for overhung rotor model with the input parameters analogous to RPT installed at TTL were obtained by excluding and including the gyroscopic effect in MATLAB software. The rotor dynamic analysis was done using ANSYS and the critical speeds for 4 modes of vibration were obtained. The experimental analysis was done in turbine mode for three guide vane openings i.e. 40%, 70% and 100% guide vane opening. The experimental result shows that the runner and draft tube have maximum vibration fluctuations at 40% guide vane opening but that of bearing is at 100% guide vane opening.

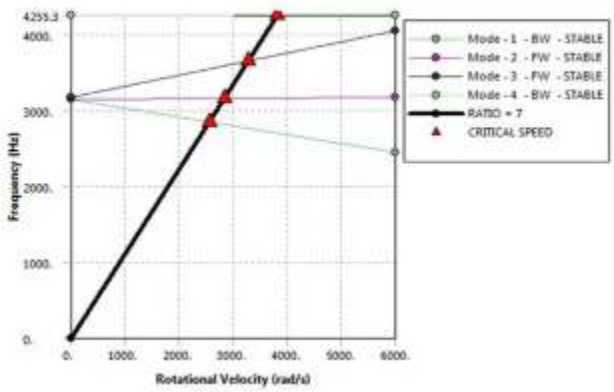


Figure 1 Campbell Diagram of RPT Runner

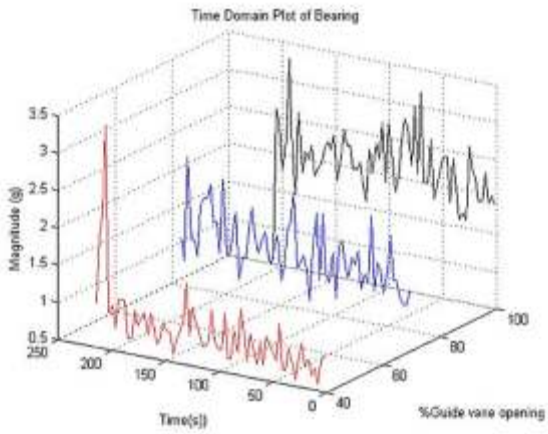


Figure 2 Acceleration Plot in Time Domain for Bearing

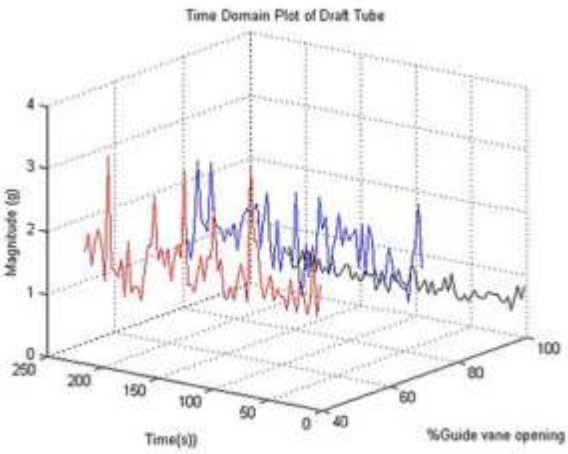


Figure 3 Acceleration Plot in Time Domain for Draft Tube

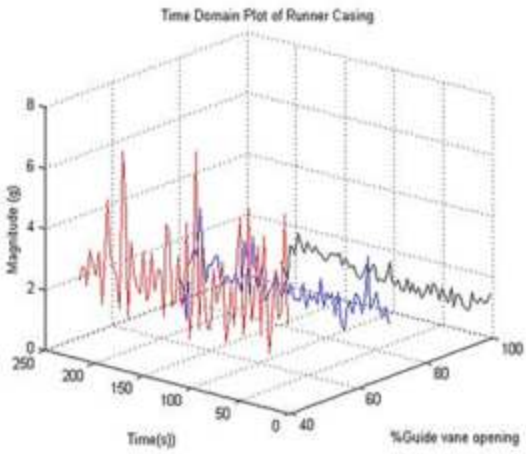


Figure 4 Acceleration Plot in Time Domain for Runner Casing

EXPERIMENTAL AND NUMERICAL ANALYSIS OF PERFORMANCE ON MODEL REVERSIBLE PUMP TURBINE IN TURBINE MODE

Group Members: Abis Poudel, Bishal Acharya, Nukesh Jung Tiwari

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Supervisors: Mr. Ravi Koirala, Research Fellow, TTL

Mr. Sailesh Chitrakar, Research Fellow, TTL

Abstract:

Reversible Pump Turbine (RPT) is relatively new concept in the field of hydroelectric power plants. There have been few researches about its feasibility in Nepal, which have given promising outcomes regarding its implementation. This work deals with the continuation of the research by performing experimental and numerical analysis on RPT inorder to plot the various characteristic curves. The test rig installed consists of several measuring equipment such as Speed (N), Torque (T), Delivery Pressure (Pi), Suction Pressure (Po) and Flow (Q). The experiment was run and these parameters were noted on four part flow and part load conditions. The second phase of the work was to perform the numerical analysis of RPT. The numerical analysis was performed by taking four fluid domain; spiral casing, guide vane, runner and the draft tube. The graph of power Vs. flow and efficiency Vs. flow were plotted. The efficiency of the RPT was found to be 26.96% at 8.88 lps of flow in the experimental analysis. In addition to this, computational analysis of the RPT was performed to determine the efficiency of RPT. The maximum efficiency of RPT achieved in the analysis was approximately 42.91% at 12.67 lps.

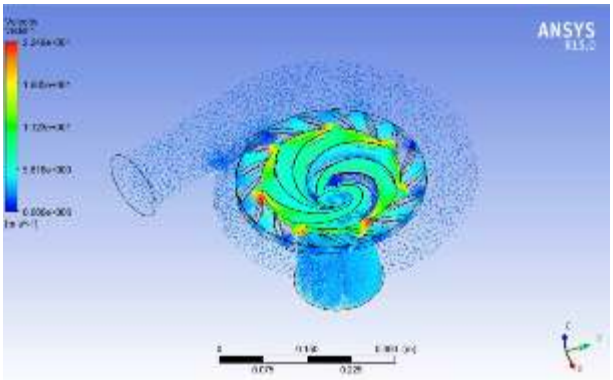

Figure 1 Velocity Plot

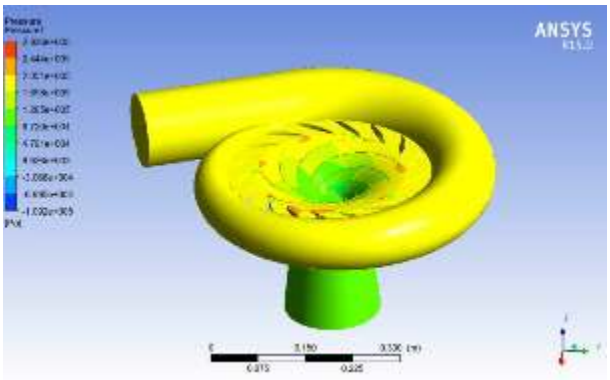

Figure 2 Pressure Contour

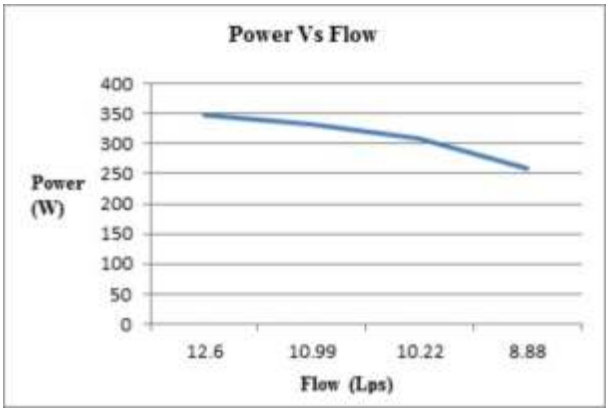

Figure 3 Power Vs Flow Obtained from Experimental Analysis Under Different Flow Conditions

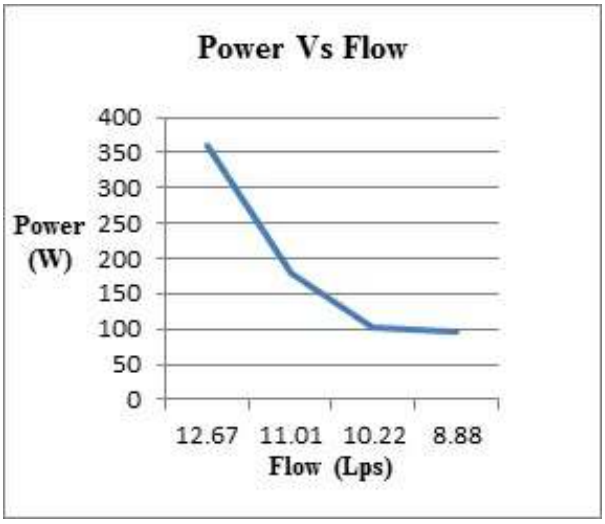

Figure 4 Power Vs Flow Obtained From Computational Analysis under Different Flow Conditions

ANALYSIS OF THE PARAMETERS AFFECTING THE DYNAMIC STABILITY OF PASSENGER CARS

Group Members: Prabin Parajuli, Prabin Shrestha, Ramesh Karki

Email: prabinparajuli@gmail.com

Supervisor: Dr. Daniel Tuladhar, Assoc. Professor

Total Cost: Rs. 6,057/-

Abstract:

Dynamic stability is the stability of the vehicle in motion and hence responsible for driving comfort and safety. Automobile layouts, Electronic stability control, Steering system, Suspension system and Traction control system are the parameters affecting the dynamic stability of the vehicle. To improve the dynamics of a moving car three important principles must be satisfied that is, road holding, road isolation and cornering characteristics. These three principles are well applied in the suspension system. So, the most important parameter affecting the dynamic stability is suspension system. It supports the body of vehicle and absorbs shocks arising from roughness of road. In this work, mathematical modeling of passive suspension for Quarter car model has been performed and then analyzed to obtain the optimum value of the suspension parameters (spring and damping constant) for providing maximum comfort to the passengers. After performing the analysis on Quarter car model, the minimum damping time obtained is 3 seconds for suspension with spring constant (k1) 20,000 N/m and damping constant (b1) 1400 N.s/m.

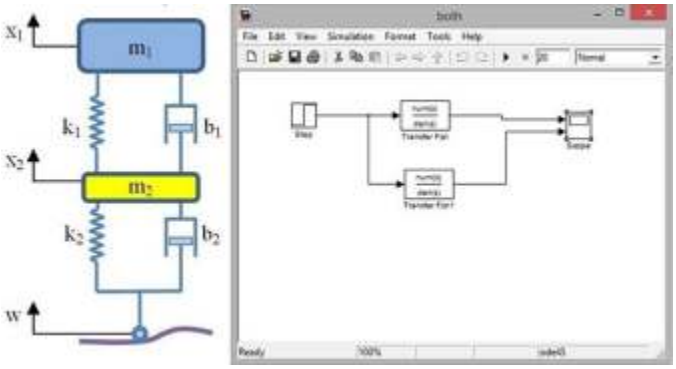

Figure 1 [From left] Quarter Car Model and Transfer Function Model in Simulink

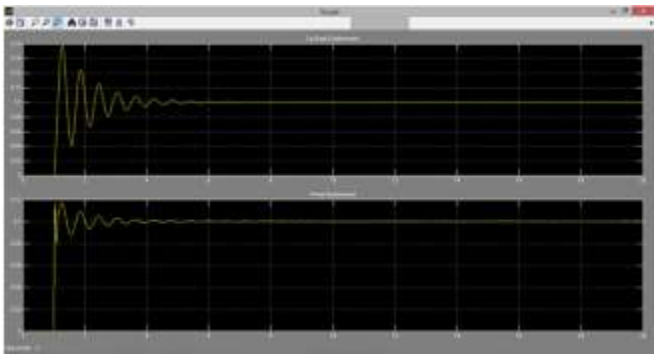

Figure 2 Graph of Car Body and Wheel Displacement Vs Time

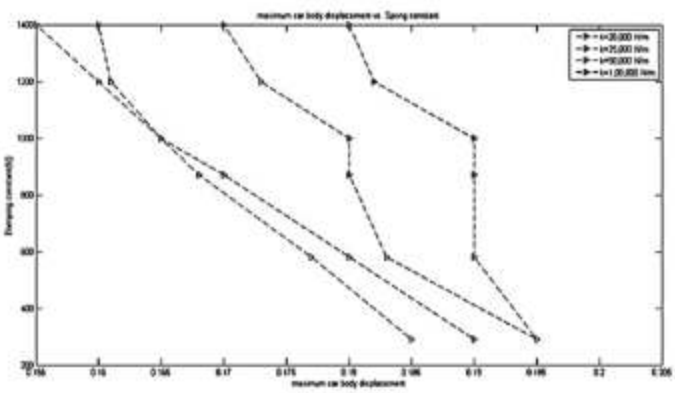

Figure 3 Graph of Damping Constant (b1) Vs Maximum Car Body Displacement (x1)

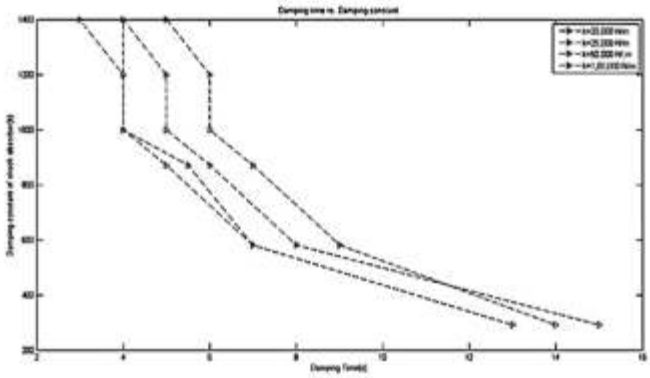

Figure 4 Graph of Damping Constant (b1) Vs Damping Time (t)

STUDY ON FLAME EFFECT ON PERFORMANCE OF SINGLE POT METALLIC COOKING STOVE

Group Members: Kailash Kunwar, Saurav Raj Bista, Sneha Sharma

Email: sauravrajbista@gmail.com

Supervisor: Dr. Bivek Baral, Assoc. Professor

Total Cost: Rs. 6,500/-

Abstract:

The design improvement of the stove focused on the following areas: provision of insulation around the combustion chamber to reduce conduction heat loss across the walls of the chamber, incorporation of smoke rings at the top of the stove, provision of sizable and adjustable air inlet to ensure the availability of sufficient air for the complete combustion of the fuel wood and the incorporation of chimney to convey flue gases away from the place of use. But the consideration of the effect of the flame has not been made. The mode of heat transfer is strongly determined by the flame type and needs to be considered in-order to determine the proper stove design. The work determines the effect of the flame on the performance of the single pot metallic cooking stove.

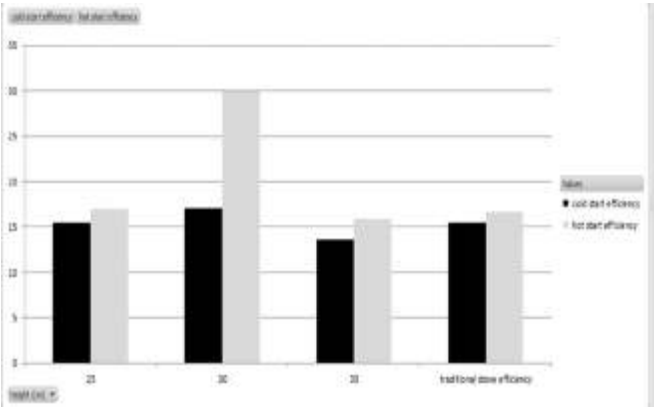

Figure 1 Representation of Efficiency of Stove (Efficiency on Y-axis and Pot Gap on X-axis) for Diffusion Flame Flame

Figure 2 Wood Consumption Rate for Cold Start

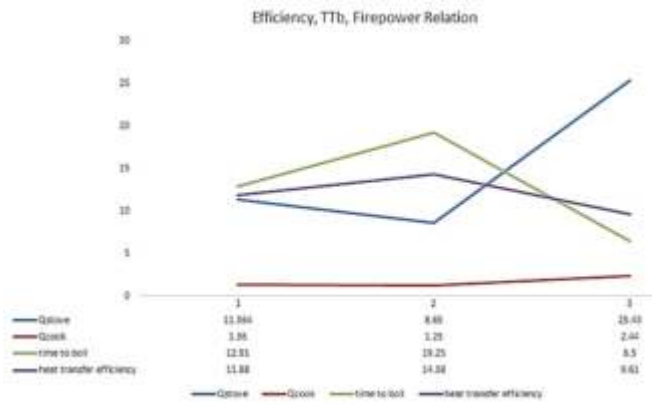

Figure 3 Representation of TTB, Firepower and Efficiency for Premixed Flame

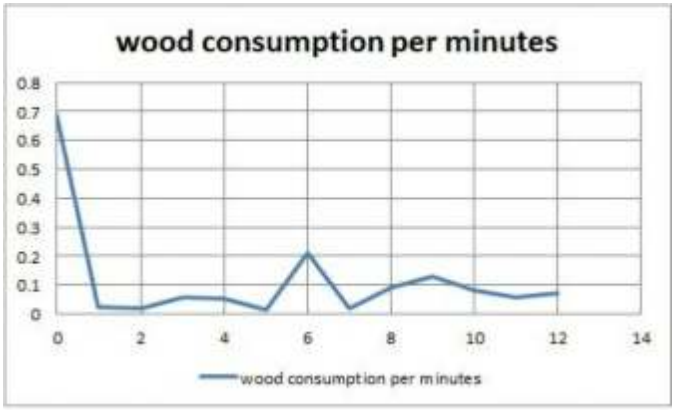

Figure 4 Wood Consumption Rate for Hot Start

DEVELOPMENT OF TOOL FOR AERODYNAMIC AND STRUCTURAL DESIGN OF WIND TURBINE

Group Members: Gyanendra Prasad Acharya, Ravindra Chaudhary, Shrabya Ghimire

Email: shrabya.zt@gmail.com

Supervisors: Dr. Hari Prasad Neopane, Assoc. Professor

Mr. Sailesh Chitrakar, Research Fellow, TTL

Mr. Binaya Baidar, Research Fellow, TTL

Abstract:

This work intends to develop a computational tool for aerodynamic and structural design of wind turbine. All calculations and designs were focused only for Horizontal Axis Wind Turbine particularly of small scale. The work was divided into Aerodynamic Design, Structural Design and Implementation on Computational Tool. Aerodynamic analysis was done based upon Blade Element Momentum Theory. Momentum balance equation was applied at each elemental parts. Diameter, angle of twist and chord length were calculated. The correctness of calculated value was verified by plotting load coefficients at different wind speeds. The graphs obtained from calculated values were similar to those obtained by NREL unsteady experiments. For structural design, physical properties of E-glass were considered. The wind turbine blade was considered as a cantilever beam with uniformly distributed force. A mathematical model was developed to calculate the structural properties like deflection, bending moment, stress and moment of inertia. Separate programs were written for calculation and verification that uses identical codes. Output of the program is extracted into spread sheet for further manipulation of the values.

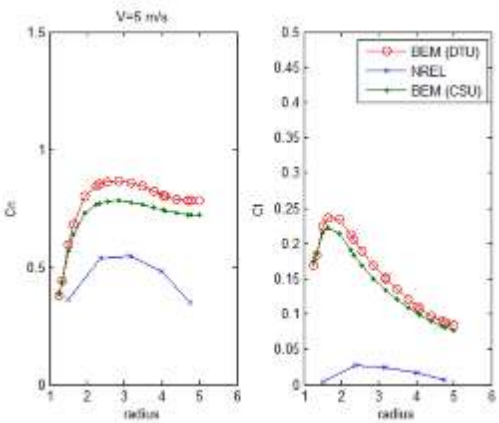

Figure 1 Radius Vs Load Coefficients at 5 m/s

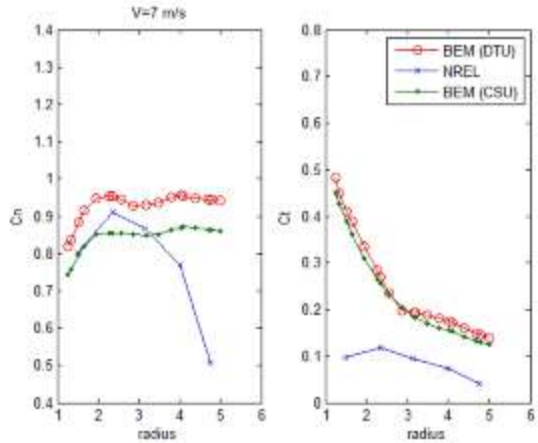

Figure 2 Radius Vs Load Coefficients at 7 m/s

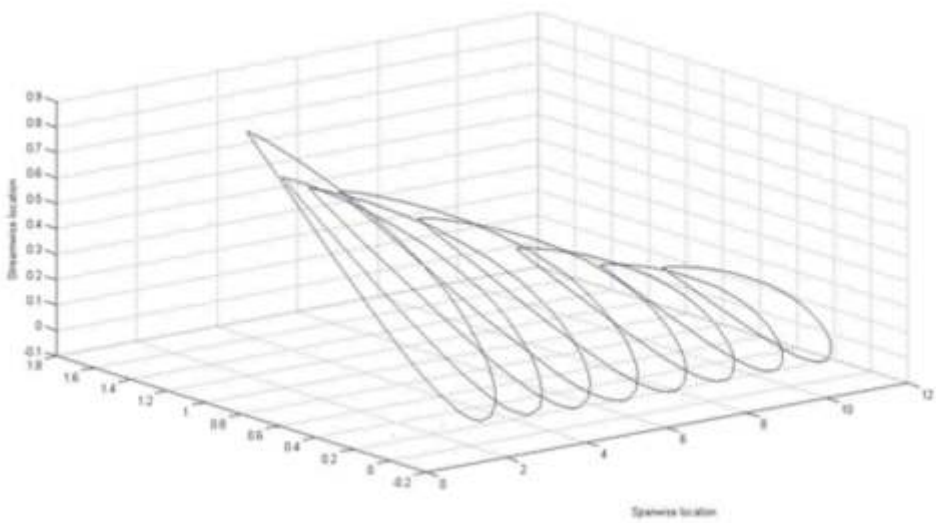

Figure 3 Wind Turbine Blade Aerodynamic Profile

A STUDY ON COMBUSTION CHARACTERISTICS OF SYNTHETIC GAS IN 4-STROKE SINGLE CYLINDER SPARK IGNITION ENGINE

Group Members: Sojan Prajapati, Sunar Gautam, Sunil Maharjan

Email: maharjansunil72@gmail.com

Supervisor: Dr. Bivek Baral, Assoc. Professor

Abstract:

This project is basically based on the use of renewable energy synthetic gas. Global carbon emission has hit all-time record and as engineers, we should also focus on the carbon emission. Syngas can be generated via several process, among these process down-draft gasifier is preferred for engine inlet since it results least tar production. Since this project deals with a renewable energy source for engine fuel, several parameters should be researched in detail if to be used as engine fuel. Among them, combustion characteristics are main variables to be studied. Mass fraction burn is predicted by using MATLAB. Laminar flame speed, calorific value and specific heat ratio has been calculated by using weightage mean of respective composition of syngas in MS-EXCEL. SS-optimization method has been used for prediction for knock occurrence crank angle. Carbon emission and NOx emission has been calculated. Then respective results including torque, brake specific fuel consumption and carbon emission of syngas and standard gasoline are compared in identical engine operating condition by using Integrated Spark Ignition Software. A correlation table between input engine parameters and engine output has been developed to find dominating parameters of engine efficiency.

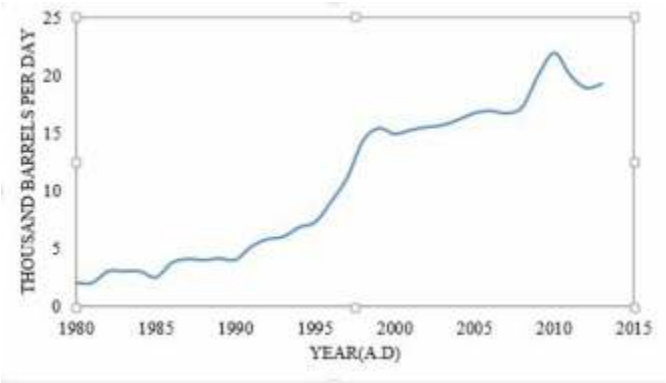

Figure 1 Present Condition of Petroleum Consumption

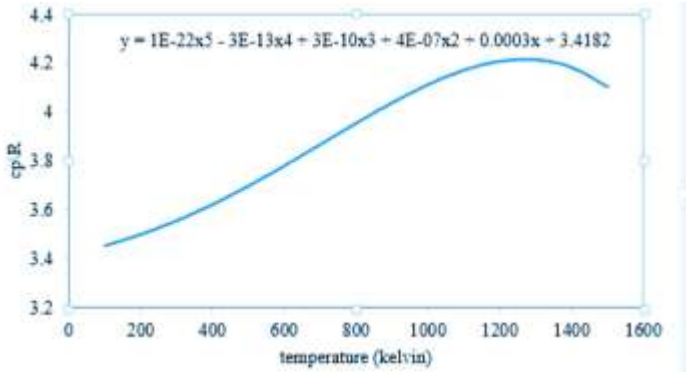

Figure 2 Temperature Vs Cp/R

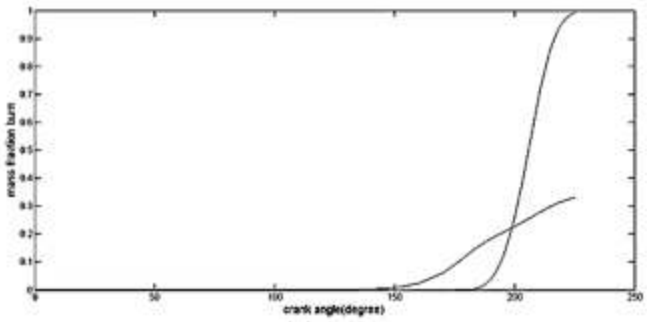

Figure 3 MFB & Knock Integral Plot w.r.t Crank Angle of Syngas

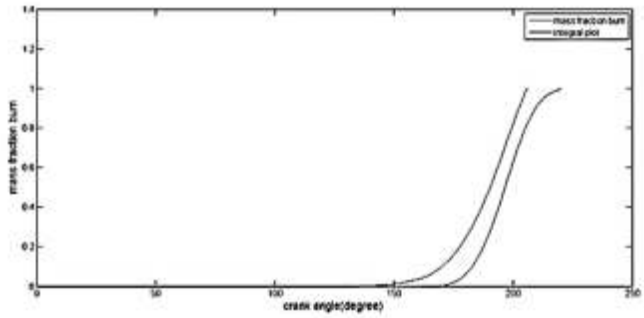

Figure 4 MFB & Knock Integral Plot w.r.t Crank Angle of Gasoline

DEVELOPMENT OF A SMALL SCALE BIOMASS GASIFIER AND TESTING OF VARIOUS FEEDSTOCKS

Group Members: Kailash Thapa Chhetri, Prakash Giri, Rejit Dulal

Email: thapakailash29@gmail.com

Supervisor: Dr. Bivek Baral, Assoc. Professor

Total Cost: Rs. 12,000/-

Abstract:
Conventionally, the use of biomass is being made for simple firing purposes for cooking and heating. However, more extensive use of biomass is seen in the gasification process that may permit electrical utilities to obtain a portion of their fuel requirements from renewable energy sources. Gasification processes convert biomass into combustible gases. Maize cones, maize stem, pine needle and cones, hog plum seeds, furniture waste, sugarcane waste, etc. which has no food value can be used to produce syngas by the help of fuel modification. For this work, three different fuels corncobs, sugarcane pellets and wood had been selected. After the completion of feedstock testing wooden biomass was concluded as the best biofuel for the designed gasifier. Syngas composition and temperature were determined with the experimental setup on 12 kW downdraft gasification system at Gasifier Laboratory of Kathmandu University.

Figure 1 Fabricated Gasifier Setup at Laboratory

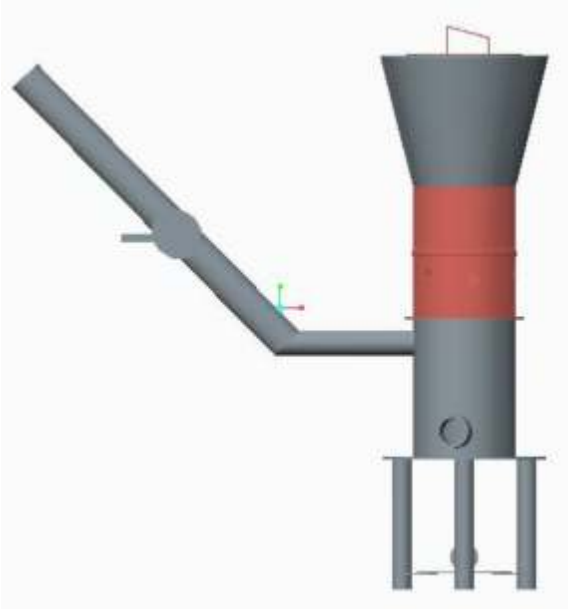

Figure 2 CAD Model of Gasifier

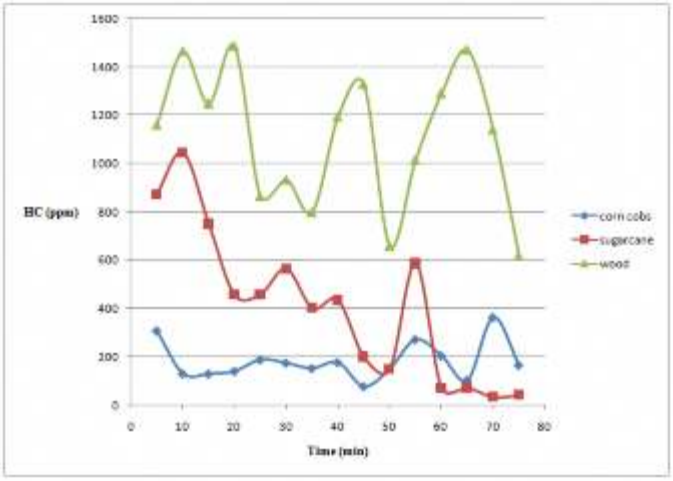

Figure 3 Time Vs HC Graph of Corncobs, Sugarcane Bagasse and Wood

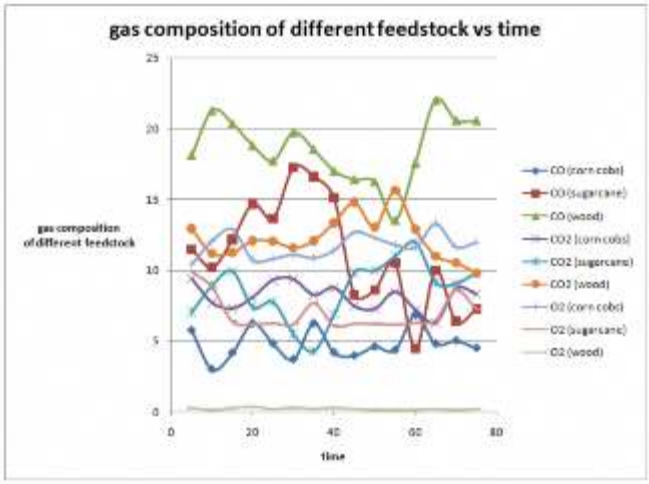

Figure 4 Time Vs Gas Composition of Corncobs, Sugarcane Bagasse and Wood

COMPARATIVE DESIGN AND ANALYSIS OF CHAURIKHOLA 'V' MICROHYDRO POWERPLANT

Group Members: Basanta Rijal, Bijay Bhattarai, Nimesh Dahal

Email: basabta.rijal9@gmail.com

Supervisors: Dr. Hari Prasad Neopane, Assoc. Professor

Ms. Supriya Koirala, Research Fellow, TTL

Mr. Ravi Koirala, Research Fellow, TTL

Abstract:

A large scale hydropower project requires a long time to deliver power after a plan is envisioned. Research has indicated micro-hydro is a suitable alternative to most of the problems related to maximum energy extraction through mega hydropower. Development of micro-hydro has been one of the major policies of Government of Nepal. Energy extraction from root level incorporating community participation from local people can help electrification of most villages of Nepal. In this work, a pre-feasibility study to understand the total energy potential of the Chauri Khola-V MHVEP was conducted. The design is according to most of international standard, but most importantly the Alternative Energy Promotion Centre (AEPC) standard. The work provide designs of penstock, expansion joint, trash rack, valve and size of cross flow T15 turbine which are the major hydro mechanical parts of micro hydro. A comparative study was done on the existing power plant with the new design developed. Mitigating steps for the failure occurring in Chauri Khola V micro-hydro was suggested.

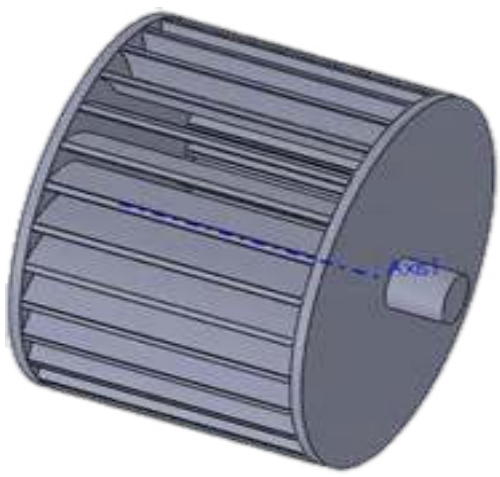

Figure 1 Cross Flow Turbine

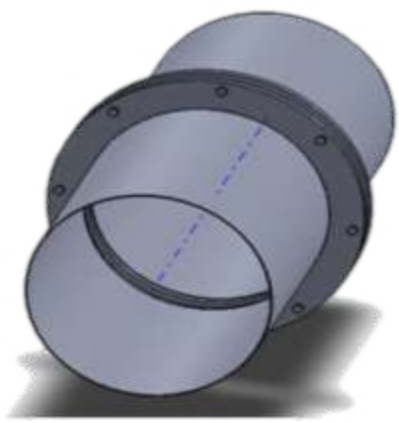

Figure 2 Penstock Assembly

Figure 3 Butterfly Valve Assembly

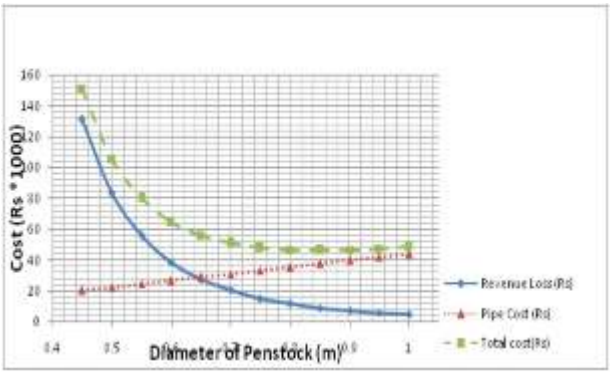

Figure 4 Penstock Design Optimization

HYDRAULIC AND MECHANICAL DESIGN OF BIFURCATION FOR HYDROPOWER PLANTS

Group Members: Keshav Kr. Acharya, Pratik Bhattarai, Sandip Acharya

Email: acharyasandip3@gmail.com

Supervisors: Dr. Bhola Thapa, Professor

Mr. Ravi Koirala, Research Fellow, TTL

Total Cost: Rs. 3,000/-

Abstract:

The installation of separate penstock for each unit is not preferred in hydropower with high head due to requirement of high investment. Therefore, the branching of the penstock is employed when the flow of water is to be divided into two or more units, or when two or more flows are to be gathered to a main pipe in the form of bifurcation, trifurcation etc. However this work focuses only on bifurcation system of Wye type for a specific site. The design of bifurcation is completed into two parts: hydraulic followed by mechanical design. Hydraulic design should reduce the head loss which consist of determination of optimum value of cone angle of branch pipe, diameter ratio and bifurcation angle due to branching as much as possible first by analytical (graphical) approach taking Indian Standard as reference and later by numerical (computational) approach by using ANSYS CFX. Mechanical design should be structurally strong to withstand against the surge and other unbalanced forces that arise in bifurcation and consists of determining thickness of penstock, the dimensions of circular, stiffening rings and stresses developed at different points of the rings due to water pressure and keeping these stresses below the allowable working stress both by analytical approach (use of formula and developing the spread sheet) and computational technique using Static Structural module in ANSYS.

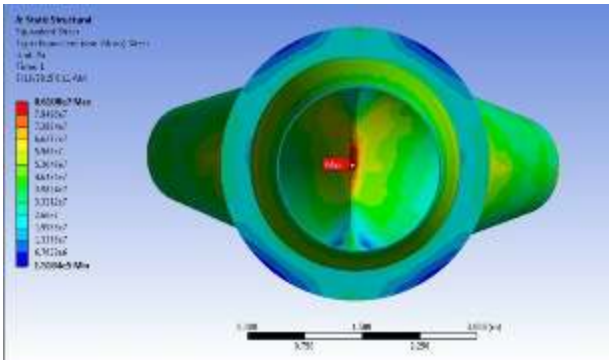

Figure 1 Equivalent Stress Contours with Maximum Stress Point for Bifurcation with Circular Ring Making Zero Degree Angle with Vertical

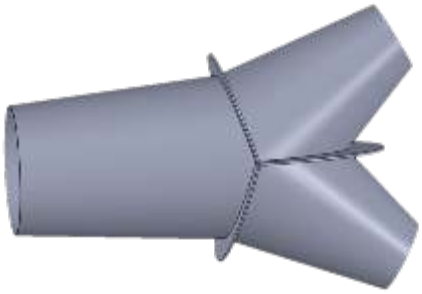

Figure 2 Bifurcation Model with Circular Rings and Stiffening Ring (Circular Ring Making An Angle 20 Degree with the Vertical) Laboratory

Figure 3 Final CAD Model for Analytical Hydraulic Design

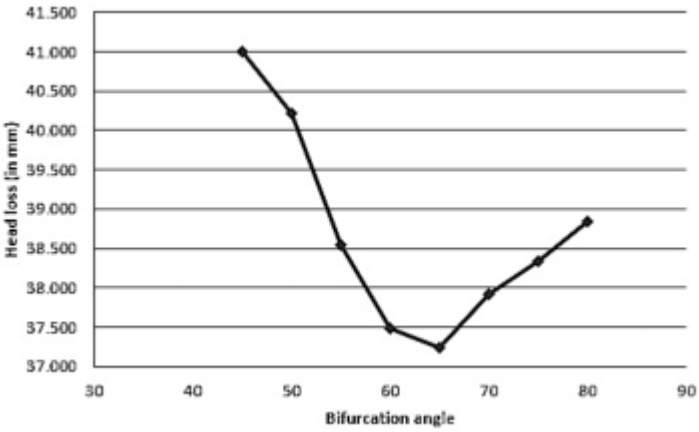

Figure 4 Head Losses for Different Bifurcation Angles

DESIGN OF A SMALL SCALE CFB BOILER COMBUSTION CHAMBER FOR LABORATORY PURPOSES

Group Members: Anil Kumar Pachhain, Avip Bastakoti, Shreedhar Neupane

Email: avipbastakoti007@yahoo.com

Supervisors: Dr. Bivek Baral, Assoc. Professor

Mr. Anup KC, Lecturer

Mr. Pratisthit Lal Shrestha, Lecturer

Abstract:

Fluidized Bed Combustion (FBC) is one of the most promising energy conversion options available today for the solution of crisis of rapid energy usage. FBC combines the high efficiency combustion of low grade fuel e.g. rice husk, wood and other agricultural waste products. The rice husk/rice straw is one kind of renewable energy source which is abundant in agricultural country like Nepal. The work used modeling tools like Solidworks for the design of a laboratory sized CFB boiler and the simulation software ANSYS FLUENT. Steady state combustion was carried out to verify the results. The methodology followed was based on literature survey, design of fuel hopper, combustion chamber and cyclone and finally using the scenario a simulation in ANSYS FLUENT. The parametric excel sheet was made specifically so that it can give the dimensions of a large variety of commercial boiler in varying environmental conditions.

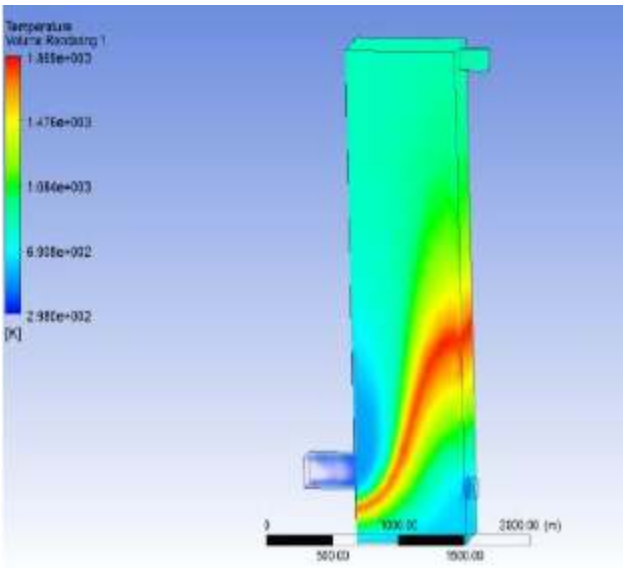

Figure 1 Temperature Distribution Contour Plot

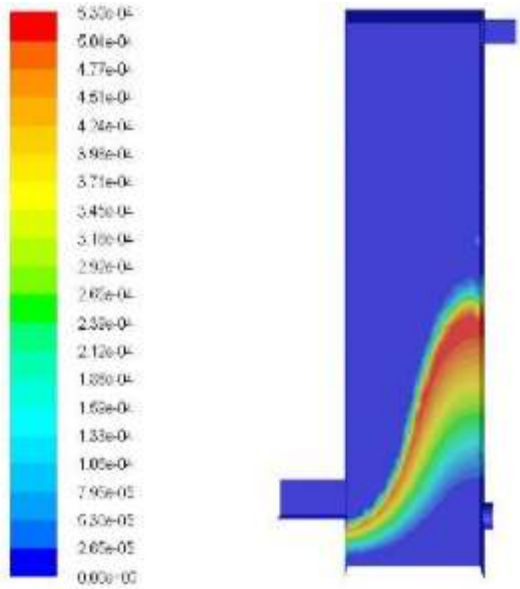

Figure 2 SO_2 Mass Fraction Contour Plot

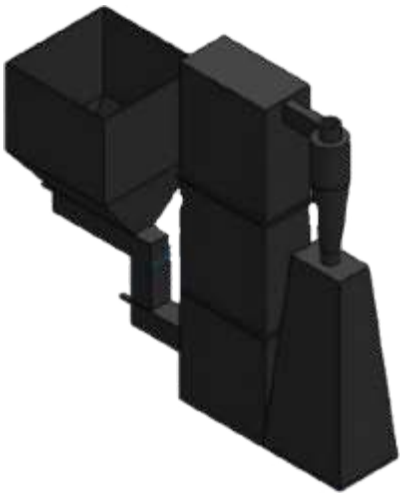

Figure 3 3D View of CFB Boiler

COMPUTATIONAL AND EXPERIMENTAL STUDY OF AN ULTRA LOW HEAD TURBINE (ULH)

Group Members: Nischal Pokharel, Pradeep Parajuli, Pratik Koirala

Email: prkoirala@hotmail.com

Supervisor: Dr. Ramesh Kumar Maskey, Professor (Department of Civil and Geomatics Engineering)

Dr. Hari Prasad Neopane, Assoc. Professor

Mr. Sailesh Chitrakar, Research Fellow, TTL

Total Cost: Rs. 9,000/-

Abstract:

The purpose of this project was to develop an efficient system to extract energy from the low head sites, test and verify to know whether the system is technically feasible and economically affordable. Research and closed view of the status of the available sites of country signifies the great feasibility and the potentiality of the ULH turbine installation. Three model was prepared and tested to find out the principle of working to figure out the result of feasibility. The computational study was carried out to find the best profile to make system efficient. A curve profile among curve, straight and twisted was found best that was later experimentally tested to get the result and compare to the result of simulation.

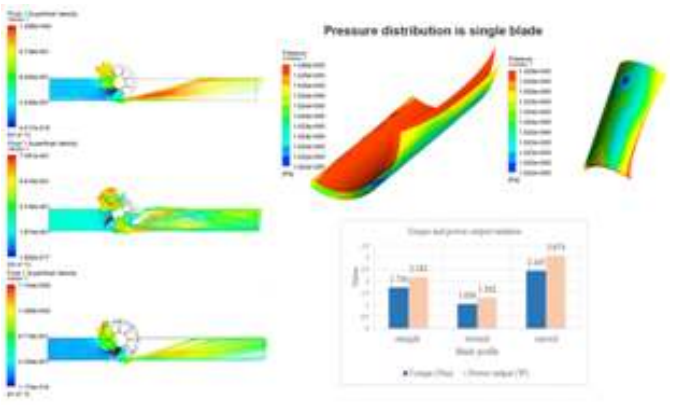

Figure 1 Velocity Distribution, Pressure Distribution and The Torque Comparison

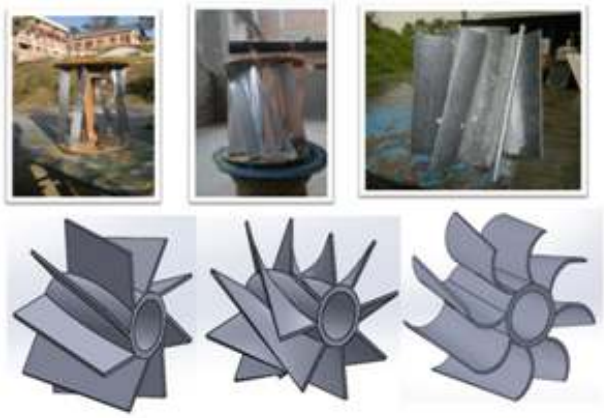

Figure 2 Successive Design of The Turbine and Actual Design Requirement

Figure 3 Experiential Testing and The Result Obtained

MATHEMATICAL MODELING OF AN ORGANIC RANKINE CYCLE

Group Members: Bipul Sapkota, Sujesh Shrestha, Vabish Karki

Email: sthsuzeish56@gmail.com

Supervisor: Mr. Pratisthit Lal Shrestha, Lecturer

Total Cost: Rs. 3,000/-

Abstract:

Organic Rankine Cycle (ORC) plant is a plant which is used to recover waste heat such as industrial waste and using it to perform some useful work. The ORC plants are simple, easy to operate and smaller than the traditional steam power plants. It can absorb the waste heat from low temperature heat sources (100 ºC -200 ºC) making them applicable for various applications. The plant consists of four major components - Pump, Evaporator, Turbine and Condenser. A Preheater can also be installed to increase the thermal efficiency of Organic Rankine Cycle plant. The mathematical model of the system was coded in MATLAB. The working fluid selection was done by comparing various fluids over some determining parameters like turbine inlet temperature. The fluid R134a which was efficient as well as eco-friendly was chosen. The change in system's efficiency was analyzed varying different parameters to optimize the system. Heat exchangers were chosen for modeling of evaporator and condenser. The hydraulic components turbine and pump are not modeled separately.

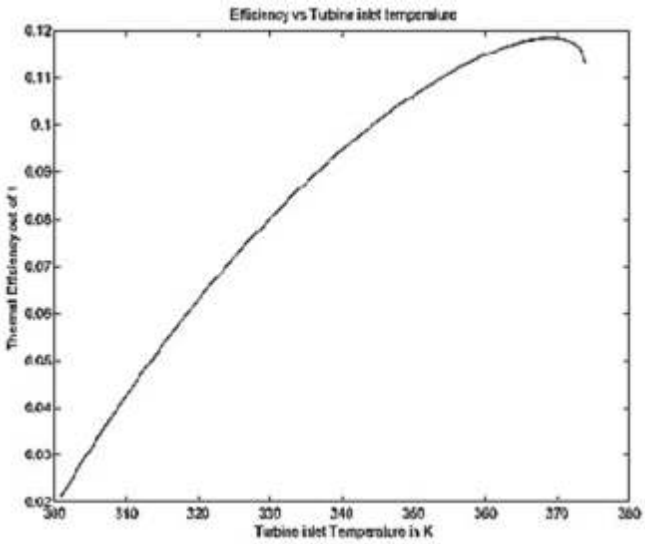

Figure 1 Turbine Inlet Temperature Vs Efficiency for R134a

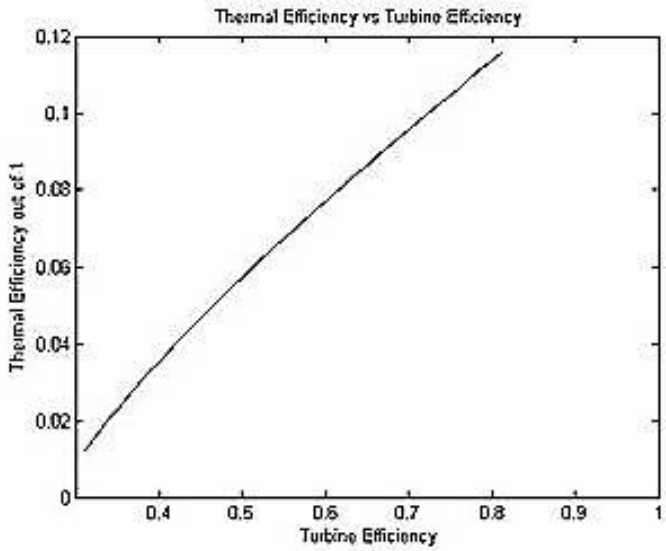

Figure 2 Thermal Efficiency Vs Turbine Efficiency

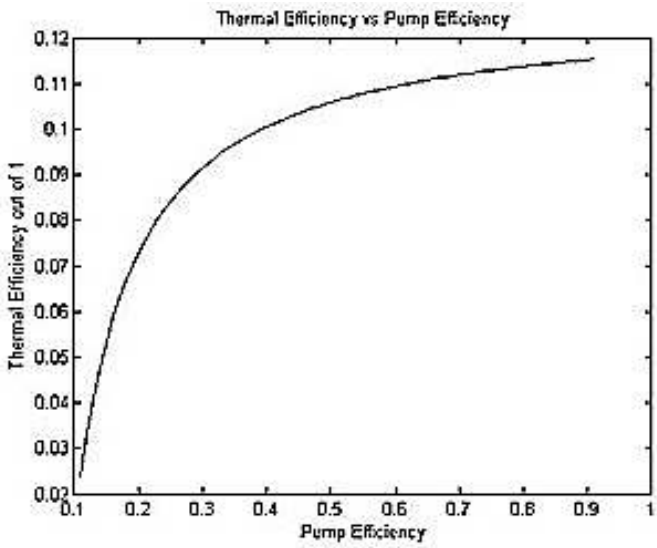

Figure 3 Thermal Efficiency Vs Pump Efficiency

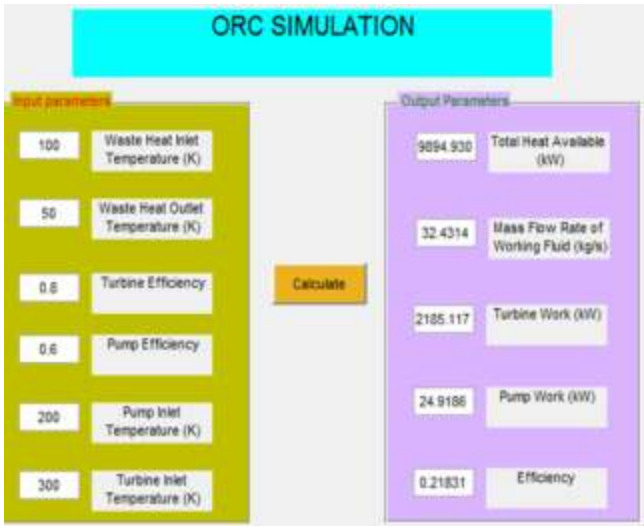

Figure 4 GUI for ORC Simulation

STRUCTURAL ANALYSIS OF BUS CHASSIS

Group Members: Anuk Man Pradhan, Sadish Maharjan, Sunny Tuladhar

Email: sadishmaharjan@gmail.com

Supervisor: Dr. Daniel Tuladhar, Assoc. Professor

Abstract:

This work involves static and dynamic analysis to determine the key characteristics of a bus chassis. Automobile chassis usually refers to the lower body of the vehicle including the tires, engine, frame, drive line and suspension. The work deals only with the chassis structure and its stress analysis using Finite Element Method (FEM) and consider some modifications to its structure to check for possible strength improvements in the TATA LP 7.12 bus.

Figure 1 CAD Model of The Bus Chassis TATA LP 7.12

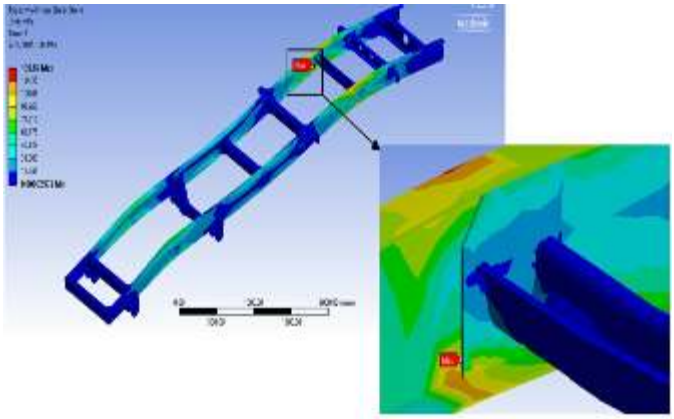

Figure 2 Structural Analysis for Static Load of The Model

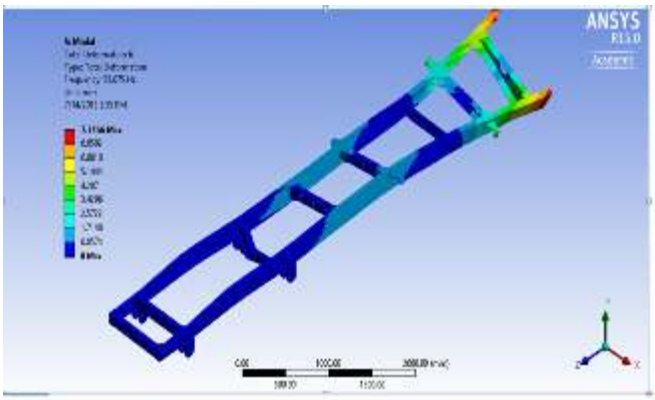

Figure 3 Modal Analysis for Static Load of The Model

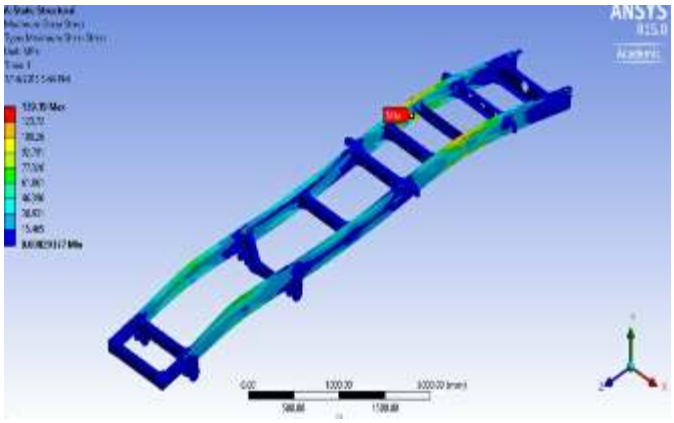

Figure 4 Structural Analysis for Static Load of The Modified Model with Additional Cross Member

DEVELOPMENT OF HILL CHART DIAGRAM FOR FRANCIS TURBINE OF JHIMRUK HYDROPOWER USING COMPUTATIONAL METHOD

Group Members: Mahesh Kandel, Prashant Neopane, Suman Sapkota

Email: juven.sumen@gmail.com

Supervisors: Dr. Hari Prasad Neopane, Assoc. Professor

Mr. Krishna Prasad Shrestha, Asst. Professor

Mr. Ravi Koirala, Research Fellow, TTL

Abstract:

This study presents the performance analysis of Francis Turbine by CFD analysis. The work is limited to computational analysis of Jhimruk Hydropower Francis Turbine under different operating scenarios. Prediction of the performance of turbine by plotting the performance characteristics curve and Hill chart is of primary concern. Performance of a turbine addresses several parameters such as efficiency, runaway speed, discharge etc. Francis runner along with stay vanes, guide vanes and draft tube are taken into consideration during the analysis. The best efficiency point of the Francis turbine is computed at guide vane angle 19.10º, flow rate 2.35 m³/s with 93.49%. The best operating scenario with vast operating regime is found at 12.54º. Specifically, the study is expected to provide a milestone for the study of performances of Francis Turbine at different loading conditions.

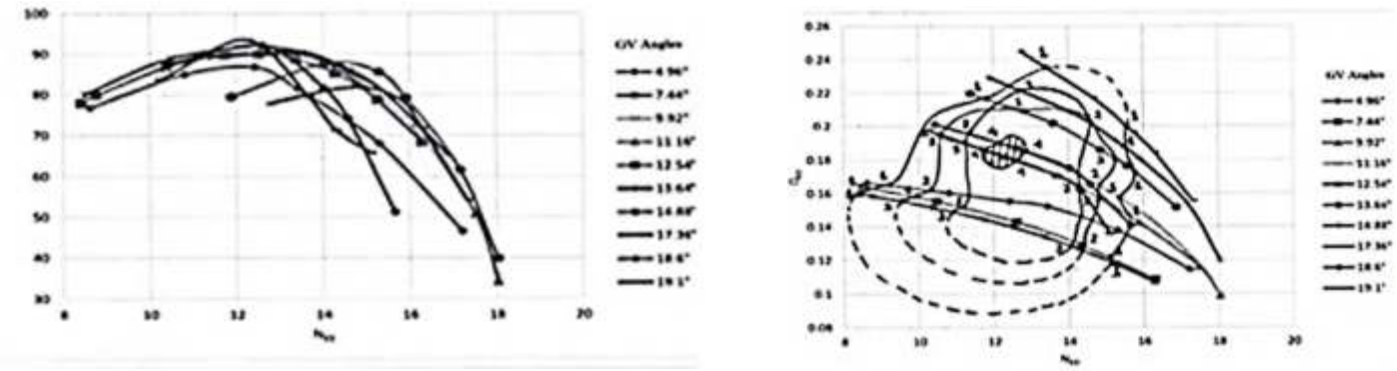

Figure 1: Velocity Streamline at GV Angle 12.54º at Flow Rate 2.35 m³/s

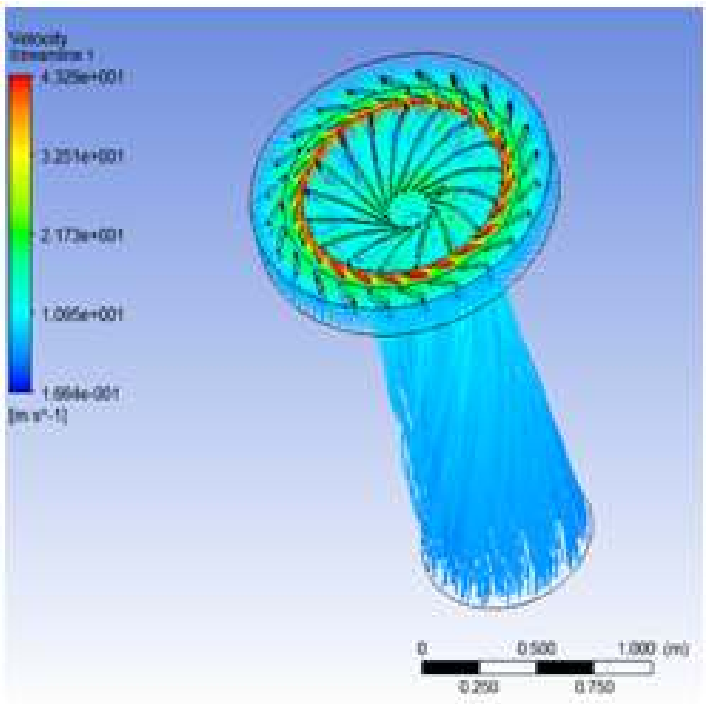

Figure 2: Hill Chart Plot

RESEARCH ON ENHANCING THE PERFORMANCE OF METALLIC IMPROVED COOKING BY BLENDING THERMOELECTRIC GENERATOR

Group Members: Chewan Dulal, Nabin Neupane, Robin Neupane, Sandesh Sainju

Email: robin.neupane@yahoo.com

Supervisor: Mr. Bijendra Shrestha, Lecturer

Abstract:

This work focuses on research in enhancing the performance of electricity generated from thermoelectric module and heating efficiency of Metallic Improved Cooking Stove. Thermoelectric generation module generates electricity from the waste heat through chimney during cooking. To generate electricity from waste heat, thermoelectric module is used. In the second phase of the work, research was focused on efficient electricity generation through thermoelectric generator. Three different experiments were performed out of which two were performed in pre-existing system and one in new fabricated system. The temperature versus time graph of all of 3 experiments were prepared. A voltage of 0.7 V and power of 0.2 W was produced after the new cooling unit was installed in new experimental setup.

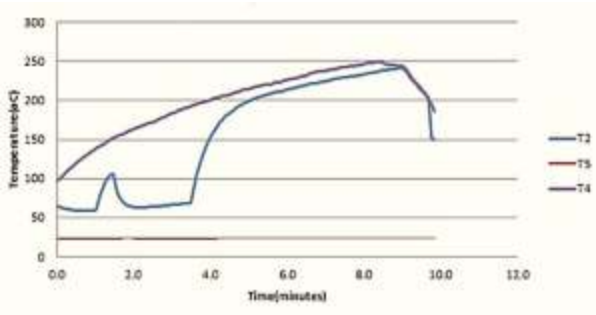

Figure 1 Temperature Vs Time Graph

Figure 2 Assembly of Cooling Unit

DESIGN AND FABRICATION OF REMOTE CONTROLLED CAMERA JIB OPERATING SYSTEM

Group Members: Kishan Maharjan, Laxman Bhatta, Priyanka Chauhan, Sajan Narasingh Suwal, Saroj Neupane

Email: bhattalaxman99@gmail.com

Supervisor: Mr. Pratisthit Lal Shrestha, Lecturer

Total Cost: Rs. 6,945/-

Abstract:

Camera jib head is a component of camera jib/boom system which mounts camera on it and assist to take difficult cinematic shots. This work deals with the design and fabrication process of the Remote Control Camera Jib Operating System. The Camera mounted on this system can rotate 360º both in horizontal and vertical axis. It has the capacity of supporting camera up to 1 kg. Speed of the motor vary from 5 to 10 RPM. The 3D space of the complete system is (450×400×150) mm. The required motor voltage ranges from 6 to 12 V. Computer Aided Design was used to visualize and analyze the mechanism as well as design of the system. EAGLE software was used to design wireless circuit. After the complete fabrication of prototype, tests were conducted to check the system and it met the requirement as per the objective.

Figure 1 Final Product

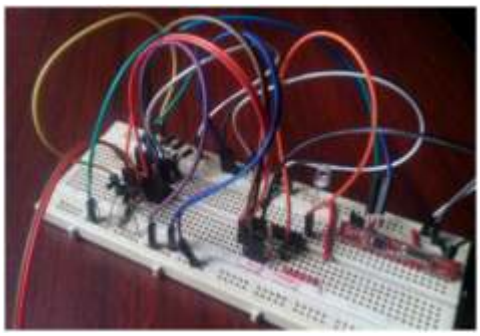

Figure 2 Receiver Circuit

DESIGN AND FABRICATION OF AMPHIBIOUS VEHICLE

Group Members: Anish Maharjan, Asish Timilsina, Asmit Upreti, Uren Amatya

Email: urenamatya@gmail.com

Supervisor: Mr. Gokarna Poudel, Senior Instructor, KUTTC

Total Cost: Rs. 15,690/-

Abstract:
The work discusses the design and develop of a prototype of an Amphibious Vehicle (AV) by applying the principles of engineering design process from concept to production. The vehicle is designed to navigate both land and still water. The work was improved by designing the product, analyzing and modification. Design of a seating system with front wheels extending to the sides in order to increase the stability and decrease the drag of the vehicle was preferred. The design requires the vehicle to have two front Y-frame elevated at the center in order to suspend the floatation device, and support the weight of an average adult person, light gears and the drive system.

Figure 1 Water Testing of Amphibious Vehicle

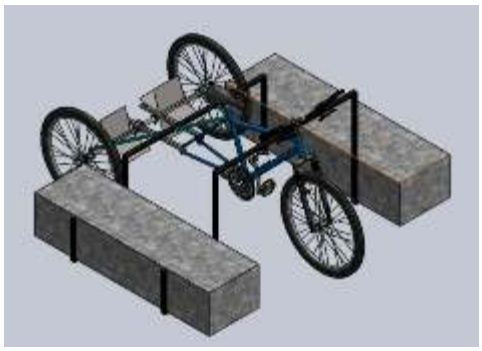

Figure 2 Solid Design

DESIGN AND FABRICATION OF TORREFACTION BATCH TYPE REACTOR

Group Members: Anish Silwal, Ankit Thapa, Asim Regmi, Rajesh Joshi, Shailesh Acharya

Email: ankitthapared@gmail.com

Supervisor: Mr. Malesh Shah, Lecturer

Total Cost: Rs. 8,000/-

Abstract:
Economic competitiveness and energy value has fast directed researchers into alternative raw materials like urban waste along with biomass byproducts. With growing environmental consequences, these can provide a valuable area of focus for energy role players. The research studies carried out in the past, to study the changes in physical appearances, energy yield and ash contents with respect to torrefaction temperature 150 ºC till 600 ºC with 50 ºC interval and less than 50 ºC/min heating rate, have proven groundbreaking in the field of alternative energy sources. This project is aimed towards designing and fabricating a Torrefaction reactor which would allow us to create torrefied pellets with higher calorific values out of urban wastes.

Figure 1 Ceramic Heating Chamber

Figure 2 Assembly of Reactor

DESIGN AND FABRICATION OF STAIR CLIMBING WHEELCHAIR

Group Members: Biraj Dhakal, Manish Aryal, Rabin Pradhan, Sweekar Dhakal

Email: rayneal.007@gmail.com

Supervisor: Mr. Gokarna Poudel, Senior Instructor, KUTTC

Total Cost: Rs. 17,430/-

Abstract:

The design and fabrication of an electrically driven stair climbing wheel chair that helps the disabled people to climb the stairs, and avoid extra hands needed for wheelchair operation and mobility issues over uneven terrains; all by means of study and application of different engineering principles and mechanisms. Wheelchair has been a common requirement among people with physical disabilities, but normal wheelchair does not give solution to all the problems that a disabled man faces like stairs, uneven terrains or steep roads. Even with the assistance of other people it is very difficult to overcome this problem so most of the time, these disabled people have to stay at home and the lack of activities may affect their psychology and physiology. The most general wheelchair is driven by rotating the rear wheel or by pushing by the third party or nowadays there are electrically driven ones as well. Stair climbing wheelchair will be driven electrically. For this wheelchair to climb the stairs up and down it uses shrimp mechanism, it could climb the stairs double the size of wheels used. Our wheelchair is six wheeled where, rear two wheels are used for supporting the wheelchair while climbing up and down the stairs. The driving motors used are motors that have high torque to drive the wheelchair with a person on the stairs.

Figure 1 CAD Design

Figure 2 Wheelchair Climbing Brick Obstacles

SYSTEM DESIGN AND FABRICATION OF A PORTABLE CLEANING DEVICE FOR REMOVING DEBRIS FROM URBAN ROAD

Group Members: Aakashdip Adhikari, Sadeep Raut, Sailesh Gautam, Saroj Gautam

Email: sadeepraut43@gmail.com

Supervisor: Mr. Pratisthit Lal Shrestha, Lecturer

Total Cost: Rs. 15,000/-

Abstract:

Debris on the road side of urban area has been major factor causing air pollution as well as deterioration of beauty of Kathmandu Valley. The system operate using human effort. Collection of debris is done by the rolling action of the scrubber, which drives the debris to the storage tank from the surface. The work was successfully designed, fabricated and tested. The prototype successfully cleaned the debris and stored in the tank. The system consists gear mechanism, sprocket-chain arrangement to increase RPM of the scrubber. Small torque of the scrubber and heavy weight are the problematic issues of the work which could be eliminated using appropriate material and using proper gear ratio.

Figure 1 CAD Design

Figure 2 Final Prototype

DESIGN AND FABRICATION OF MOBILE ROBOTIC ARM FOR PICK AND DROP PURPOSE

Group Members: Ashish Pokhrel, Kapil Pandey, Nirajan Kumar Piya, Prabin Shrestha, Suyash Niraula

Email: nirajanpiya9@gmail.com

Supervisors: Dr. Bim Prasad Shrestha, Professor

Mr. Pratisthit Lal Shrestha, Lecturer

Total Cost: Rs. 25,083/-

Abstract:

Robots are the machines which perform the complicated and repetitive task faster and efficiently. The pick and drop purpose robotic arm features three arm manipulation input in between -60º to 60º from its mean position and carry up to the arc of 600 mm from its center. The end arm consists of gripper that can carry object of 2 N of width about 80 mm. The robotic arm can rotate about 180º with the help of the rotating base. The arm can be manually operated or by preloaded program. The arm can be further modified to feature wireless controlling, more sophisticated programming.

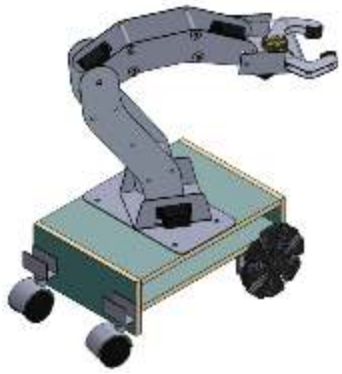

Figure 1 CAD Design

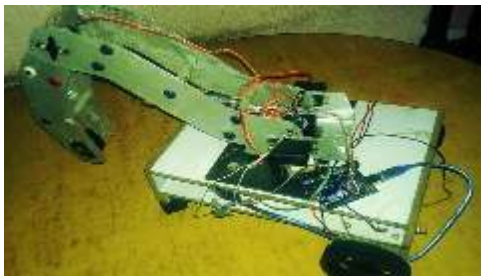

Figure 2 Pictorial View of Mobile Robotic Arm

CONVERSION OF COMPRESSION IGNITION ENGINE INTO SPARK IGNITION ENGINE FOR SYNTHETIC GAS

Group Members: Bishnu Dhakal, Kamal Sapkota, Sabin Bhattarai, Ujjwal K.C.

Email: Ksapkota2051@gmail.com

Supervisor: Dr. Bivek Baral, Assoc. Professor

Total Cost: Rs. 15,000/-

Abstract:

Synthetic gas can be used in usual Spark Ignition Engine, but the efficiency of engine is not so good because of diluents present in synthetic gas. Efficiency of engine is increased by increasing compression ratio. Compression ratio of Compression Ignition Engine is greater than Spark Ignition Engine. Hence synthetic gas can be used in Compression Ignition Engine to increase the efficiency. Synthetic gas has high self ignition temperature and temperature reached during compression is not sufficient to ignite the synthetic gas. Spark should be introduced by external means. Spark Ignition System can be used to ignite the mixture in combustion chamber. Injector of CI engine is replaced by spark plug. Air and fuel are pre-mixed and sent to combustion chamber as in SI engine.

Figure 1 Converted Engine

Figure 2 Meshing Distributor with Cam Shaft

DESIGN AND FABRICATION OF MOBILE ROBOTIC FIRE EXTINGUISHER

Group Members: Bipan Banjara, Sangam Mainali, Subhanjan Bista, Utsavraj Aryal

Email: autsavraj_aryal2049@yahoo.com

Supervisors: Dr. Bim Prasad Shrestha, Professor

Mr. Anup KC, Lecturer

Total Cost: Rs. 15,890/-

Abstract:

Logical unit controlled with arduino and operation controlled by bluetooth, this device automatically activates the extinguisher unit when fire is introduced within the range of flame sensor embedded with it. The body made with fiber glass makes it transparent and attractive. System has four metal geared dc motors of 40 rpm to mobilize robot in all directions and has two 10 rpm motors to operate the pan and tilt mechanism to control nozzle movement. Water is pumped through ½ HP pump from fixed water resources and the compression nozzle in system releases high velocity jet of water to extinguish the fire once the pump is made on by relay. Its target areas are open spaces, furniture and godowns and areas where access is easy.

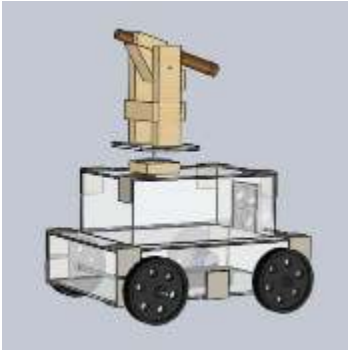

Figure 1 CAD Design

Figure 2 Completed Model of Robot

DESIGN AND FABRICATION OF OBSTACLE DETECTING CAR

Group Members: Aashish B.K, Kush Kuikel, Sarik Amatya, Sudish Gyanwali

Email: kushkuikel@gmail.com

Supervisors: Dr. Bim Prasad Shrestha, Professor

Mr. Anup KC, Lecturer

Total Cost: Rs. 9,770/-

Abstract:

This work is intended to introduce a basic design model of self-controlled car that uses Arduino micro-controller as its brain. The main focus of the work is to produce an obstacle detecting model car which may be very useful to explore the places around and to spy others. This work presents the navigation of an autonomous vehicle in real-world environments. Due to base on sensing the uncertainty in the environment, a complex decision based mechanism is required for path tracking environment and controlling the robot under different conditions. The autonomous vehicle consists of ultrasonic sensors mounted at the front. Several test cases are considered to take into account different situations like different types of obstacle and the position of obstacles. The robot makes its decision using if-else conditions and the speed is varied for smooth navigation.

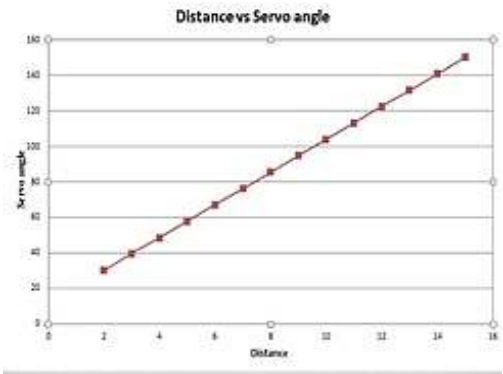

Figure 1 Distance Vs Servo Angle

Figure 2 Complete Fabrication of The Body and Circuit.

PERFORMANCE ANALYSIS OF DIESEL ENGINE WITH BIODIESEL

Group Members: Abinath Thapa, Apurba Dahal, Bipeen Bhandari, Ram Bahadur Ale

Email: abi.thapa1993@gmail.com

Supervisor: Dr. Bivek Baral, Assoc. Professor

Total Cost: Rs. 3,550/-

Abstract:

This work was targeted to study the conditions that would enable to the introduction of ethanol in a diesel engine without any spark plug for ignition. Problem of the supply of the fuel in developing countries has mainly motivated for the initiation of this work. Ethanol-diesel blending has been selected as an alternative fuel source for diesel fuel. Through the literature survey it has been found that the engine power, torque and fuel efficiency tend to be lower while using biodiesel. A biodiesel was prepared from waste vegetable oil by the transesterification process. The quality of biodiesel produced were tested to meet the standard specifications and was blended with commercially available diesel fuel. Performance analysis of the diesel engine with different biodiesel blends were obtained. The emission of diesel engine with biodiesel yield less carbon dioxide content and more oxygen content which is regarded as environment friendly. The overall analysis has shown that biodiesel has potential as an alternative fuel in conventional internal combustion engine.

Figure 1 Biodiesel Production with Glycerin

Figure 2 Heating Oil to Remove Water Content

DESIGN, FABRICATION AND TESTING OF COOKING STOVE AND CHECKING POSSIBILITY FOR SECONDARY COMBUSTION

Group Members: Ramanshu Jha, Sujan Thapaliya, Ujjwal Shrestha

Email: romeoshrestha.shrestha@gmail.com

Supervisor: Mr. Bijendra Shrestha, Lecturer

Total Cost: Rs. 17,000/-

Abstract:

Improved cooking stove is a device that is used to cook food with less fuel consumption, reduced smoke emission and more efficiency. Through this work design, fabrication and testing the cook stove for achieving higher combustion and higher efficiency was conducted. The work also checked the possibility of secondary combustion thus producing high temperature (blue) flames. The stove was fabricated using mild steel of 1.5 mm thickness. Fire Brick insulates the combustion chamber which has thermal conductivity of 1.34. The stove was octagonal in shape with each side 300 mm and height of 700 mm. It consists of primary and secondary combustion chamber which has conical cross sectional area. The upper cone diameter was 300 mm which is same as that of pothole and lower cone diameter was 100 mm. The two cones were arranged as nozzle and diffuser as shown in figure. Average thermal efficiency of high power cold start test was 17%, low power hot start was 21% and simmering test was 7%.

Figure 1 Completed Stove with Insulation

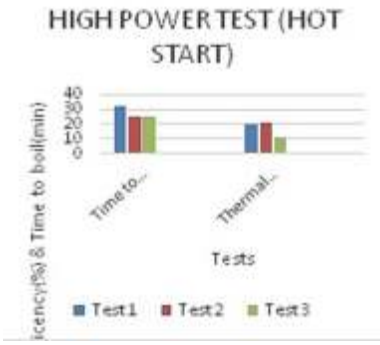

Figure 2 Efficiency of ICS in Hot Start Test

DEVELOPMENT OF HEAT TRANSFER EDUCATIONAL PACKAGE BASED ON MATLAB

Group Members: Aashish Ghimire, Prabesh Devkota, Niraj Satwal, Umesh Neupane

Email: prabeshdevkota9@gmail.com

Supervisor: Dr. Bivek Baral, Assoc. Professor

Abstract:

Among many exceptional computer tools available MATLAB is preferred for this work. MATLAB, being a mathematical software package can relate the students to conceptual and practical aspects regarding heat equations. It also helps the students to visualize the heat transfer and explore the effects of changes in geometry, properties and operating conditions. Awareness and ability to apply programming skills to solve heat equations would be of great advantage for us students to tackle the real life problem when we later work as professional engineers. Hence this project tries to create a bridge between theoretical aspects of heat transfer and computational analysis using MATLAB.

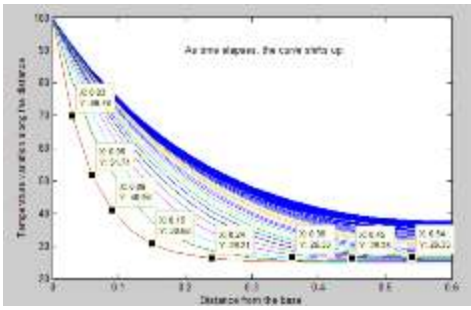

Figure 1 Graph of Temperature Vs Distance from Base in 1 d Fin

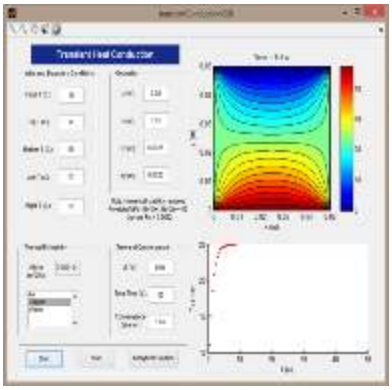

Figure 2 Temperature Distribution for Copper as Material

DESIGN AND FABRICATION OF HYDROGEN GENERATOR FOR PETROL ENGINE

Group Members: Kunjanath Upadhyaya, Sagar Chand Thakuri, Sneha Shrestha

Email: sneha_shrestha1995@gmail.com

Supervisor: Dr. Bivek Baral, Assoc. Professor

Abstract:

In this work, we designed and fabricated the hydrogen generator for the production of the hydrogen gas from electrolysis of water was carried out. Electrolysis is an electrochemical process in which electrical energy is the driving force of chemical reactions. Substances are decomposed, by passing a current through them. The most important part of the construction of electrolysis units is to use adequate electrodes to avoid unwanted reactions which produce impurities in the hydrogen gas. A way of improving electrolysis unit efficiency is by increasing the process temperature which lowers the voltage required to electrolyze the water, but also requires more expensive materials. At elevated temperatures (800-900 °C) the electric power consumption is approximately only 3 kWh/m^3 of hydrogen. Process is affected by heavy energy losses in form of heat during the process which was found to be 23% of total energy supplied .The process was also accompanied by other losses which seem to remain unknown. Therefore the overall resulting efficiency of the designed generator was however found to be about 66%.

Figure 1 Experimental Arrangement for First Electrolysis

Figure 2 Froth Formation due to Impure Water Affecting Hydrogen Production

DESIGN AND FABRICATION OF SOLAR STEAM GENERATOR

Group Members: Animesh Bachan, Dal Badadur KC, Dinesh Dahal, Raman Banjara, Shyam Shrestha, Utshav Pandey

Email: ddahal1995@gmail.com

Supervisor: Mr. Pratisthit Lal Shrestha, Lecturer

Total Cost: Rs. 7,310/-

Abstract:

Solar Steam generator is a device which converts water at room temperature to a steam of high temperature. It uses line parabolic concentrator for focusing distant rays onto a single line i.e. heat receiver tube. It has manual tilting mechanism so that parabolic dish reflector can be tilted on desired angle according to orientation of sun. On average sunny day, the device produced high quality of steam of 110 ºC from water of 17 ºC at an efficiency of 32%.The device comprises of stainless steel as parabolic reflector, solar tube as water flowing system and mild steel frame.

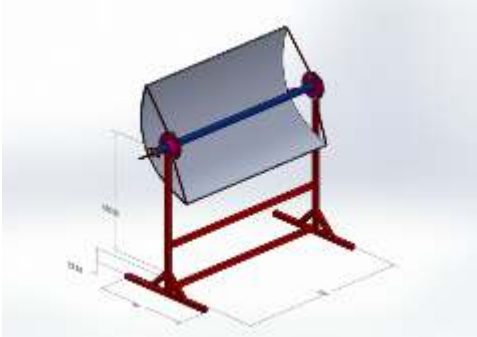

Figure 1 CAD Design

Figure 2 Final Model of Solar Steam Generator

DESIGN OF WATER-DRIVEN WATER LIFTING SYSTEM FOR IRRIGATION AND FABRICATION OF ITS PROTOTYPE

Group Members: Abinish Kumar Dutta, Bibhor Shrestha, Janak Shahi, Vijay Kumar Chaudhary

Email: abinishdutt@rocketmail.com

Supervisor: Mr. Pratisthit Lal Shrestha, Lecturer

Total Cost: Rs. 7,383/-

Abstract:

The 'Water-Driven Water Lifting System' is a system that requires no external source of energy but a flowing stream of water. The system allows water to be scooped up and pumped towards a location up inland, making it an ideal solution for farmers situated near rivers and canals that require continuous access to water for irrigation. It's a more sustainable and economical alternative to other irrigation solutions such as diesel and solar-powered pumping. A basic design like ours induces virtually no operation or maintenance cost and is much cheaper than other irrigation solutions. With ample water resources available all over the country, its use could become ubiquitous and entirely feasible. Since it is a fairly efficient equipment, the use of Water-Driven Water Lifting System can cause no serious loss to the farmers and prove to be a boon instead. It is efficient in the sense that it reduces the tiresome labor to carry the water to the higher lands and allows portability due to its concise design. The basic design of the system consists of an undershot wheel run by the flowing water, which causes a pump to reciprocate through motion conversion using a crank shaft. The pump then ejects water which is transported to the desired location using a pipe.

Figure 1 The Final Assembly

Figure 2 Side View of The Assembled System

DEVELOPMENT OF A PRODUCER GAS ENGINE FROM A SINGLE CYLINDER DIESEL ENGINE

Group Members: Pradeep Baral, Pragati Poudel, Raju Paudel, Sudhir Thapa, Suraj Thapa

Email: pragati.poudel37@gmail.com

Supervisor: Dr. Bivek Baral, Assoc. Professor

Total Cost: Rs. 7,600/-

Abstract:

The work is about the modification of an existing diesel engine to a spark ignition producer gas engine. For this conversion, a shaft was to be designed for the magneto. The shaft needs to be free from any kind of wobbling, hence two shafts were designed and were then connected. For the spark ignition, a circuit was designed and prepared and spark was installed. Spark plug was installed into the system through a hole which was bore in the system. The design of the representative circuit for the same was carried out.

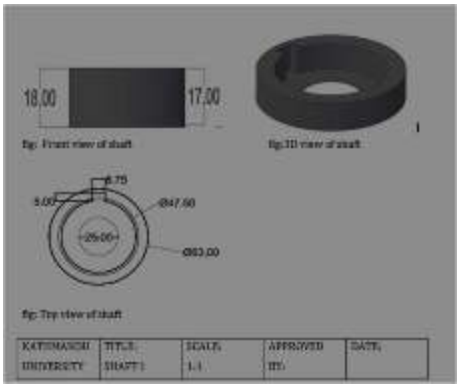

Figure 1 CAD Design of Shaft

Figure 2 Converted Producer Gas Engine

DESIGN AND FABRICATION OF COMPRESSED AIR ENGINE

Group Members: Abidit Kadel, Ashim Khadka, Bimal Raj Khatri, Samir Khadka

Email: someair18@gmail.com

Supervisor: Mr. Malesh Shah, Lecturer

Total Cost: Rs. 4,500/-

Abstract:

A compressed air engine is a type of engine which does mechanical work by expanding compressed air. This work discusses the design and fabrication of Compressed Air Engine. This engine is based on inversion of single slider crank mechanism called oscillating cylinder engine. It consists of piston, cylinder, crank wheel, flywheel, base and upright. The engine discussed in here is single acting cylinder arrangement. It generally converts the compressed air energy into mechanical work by converting reciprocating motion into rotary motion achieved by means of crank. The efficiency of the engine was considerably low when tested.

Figure 1 CAD Design

Figure 2 The Final Assembly of Compressed Air Engine

RATIONAL DESIGN AND FABRICATION OF HOG PLUM (LAPSI) SHREDDER

Group Members: Basanta Aryal, Niraj Joshi, Prajal Koju, Prajwol Luitel, Tanka Pd. Gyanwali

Email: tgyanwali@yahoo.com

Supervisor: Mr. Pratisthit Lal Shrestha, Lecturer

Total Cost: Rs. 5,000/-

Abstract:
This work includes design along with final picture of model and different parts of hog plum shredder. Advantages and uses of hog plum shredder are also highlighted in this work. This machine is able to overcome the conventional hog plum shredding methods to certain extent. Theories, calculation and testing regarding this machine are also properly illustrated. A field visit at Sanga was conducted and the viscosity of Hog plum and water, mixture in ratio 1:1 was determined. Furthermore, the machine was designed with new processing idea, which contain two roller with helical groove on surface of it. The machine is able to separate pulp and seed which was the major goal.

Figure 1 Solid Modeling of Lapsi Shredding Machine

Figure 2 Final Product Outlook

STUDY AND FABRICATION OF SHREDDER

Group Members: Anuj Acharya, Bijay Lama, Kritish Jung Karki, Nabin Khadka, Nischal Chaulagain

Email: kjungkarki@gmail.com

Supervisor: Mr. Pratisthit Lal Shrestha, Lecturer

Total Cost: Rs. 6,120/-

Abstract:
Shredder machine is used for shredding i.e. converting kitchen and garbage waste products into small or micro easily decomposable form, which can be used as organic manure. Also for shredding papers containing valuable information. Two circular grooved cutting shafts are interlocked (with small clearance) with each other which helps to shred the materials.

Figure 1 Final Design

Figure 2 Cutting shafts

DESIGN AND FABRICATION OF SOLAR POND (SP)

Group Members: Adarsha thapa, Bibek Bhetawal,
Girish Chandra Pokharel, Prithvi Thapa

Email: prithvi.thapa13@gmail.com

Supervisor: Mr. Malesh Shah, Lecturer

Total Cost: Rs. 10,490/-

Abstract:
A Solar Pond is a large area solar collector that uses water pond between one to four meters deep as a working material for collection of radiant energy and its conversion into heat, storage of heat and transport of thermal energy out of the system. Solar energy will warm a body of water, but the water loses its heat and rises unless some method is used to prevent this process. The salinity gradient in SPs prevents convection currents, thus making a SP much more efficient in solar heat storage than a body of water of the same size. A portable SP was fabricated in this work. The materials mainly used are wood, paints, corks, thermometers and thermocouples. A truncated square shaped pyramid made up of wood was used as the tank to store the heat (thermal storage).

Figure 1 Completed System of Solar Pond

Figure 2 Water Tank

STUDY, DESIGN AND FABRICATION OF ENSILLING MACHINE

Group Members: Anir Maharjan, Biraj Khanal, Linus Shrestha,
Rohini Khyen, Shuvam Paudel

Email: aristo.maharjan@gmail.com

Supervisor: Mr. Pratisthit Lal Shrestha, Lecturer

Total Cost: Rs. 7,000/-

Abstract:
Feeding the livestock in agricultural regions has always been busy act for farmers/villagers and often may get exhausting to manage enough feed during off-seasons. They have to search for feed enough to sustain their livestock. A feed block has been quite a good solution to this problem. A feed block is a feeding product to animal when and where feeding problem arises. This work is concerned to the study, design and fabrications of the same feed block and to upgrade the system with possible modification to the pre-existing procedure based on study if feasible according to the resources available.

Figure 1 CAD Design

Figure 2 Final Assembly of Ensilling Machine

STUDY, DESIGN AND FABRICATION OF MANUAL PLASTIC POUCH SEALING MACHINE

Group Members: Bibek Gupta, Dhirat Raut, Prarora Koirala, Rupesh Dangol, Subarna Basnet

Email: dangolrupesh2015@gmail.com

Supervisor: Mr. Pratisthit Lal Shrestha, Lecturer

Total Cost: Rs. 6,500/-

Abstract:

Sealing machine is used to seal the packages made up of thermoplastics which are in the form of sheet and sealing them with Impulse heat sealing method by using the lever mechanism. It has heating elements (one or two) of Nichrome placed between a resilient synthetic rubber pad and a fabric (Teflon cloth). The heating element is not continuously heated. Heat is generated only when current flows. When the plastic is placed between the heat sealing mechanism, it is held in place by pressure between the two flaps. There is a use of foot pedal for the application of force for the sealing based on lever mechanism. The difference between this model and the traditional model is the use of foot pedal to seal the packages airtight. This mechanism reduces human effort and is cost efficient.

Figure 1 CAD Design

Figure 2 Front View of The Model

DESIGN AND DEVELOPMENT OF PROTOTYPE OF MECHANICAL GRASS CUTTER FOR ELEPHANT GRASS

Group Members: Akshay Gautam, Ishwor Acharya, Nikesh Bhandari, Rajendra Dhakal, Sunil Dev Dhakal

Email: dhakal14@gmail.com

Supervisor: Dr. Bivek Baral, Assoc. Professor

Total Cost: Rs. 67,709/-

Abstract:

Invasive species adversely affect the ecology and habitat of the existing species in a particular land and Elephant grass (locally called *Dhadda* and scientific name *saccharum ravennae*) is a perennial grass similar to sugarcane which is rapidly occupying the grassland and decreasing its area. This species has high biomass rate of production i. e. 40 tonnes/hector/yr and is often found in swamp land. It is a large grass with very tall stem which can grow up to 15 feet tall. This work focused on design and fabrication of a prototype of a mechanical grass cutter that can be suitable for cutting this invasive species (Elephant Grass) found in the Nepalese Jungle which is deteriorating the grassland rapidly, mainly in Chitwan National Park. The new design is based on the slider crank mechanism for the reciprocity motion of the blades to cut this species. The reciprocity motion by slider crank mechanism is obtained using an electric motor to move a shaft connected to the crank which rotates at three different speeds to obtain the variable cutting speed. The crank speeds are 175 rpm, 350 rpm, and 550 rpm and the corresponding cutting velocity of the slider are 0.93 m/s, 1.86 m/s and 2.77 m/s respectively.

Figure 1 Fabricated Product

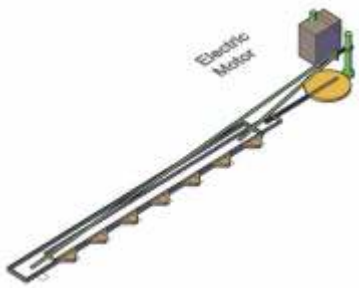

Figure 2 CAD Design

DESIGN, FABRICATION AND PERFORMANCE ANALYSIS OF SMOKE HOOD IN RURAL COMMUNITY OF NEPAL

Group Members: Kushum Dhakal, Rishi Raj Tamang, Shishir Dahal, Subash Titung Tamang

Email: shishir819@gmail.com

Supervisor: Mr. Bijendra Shrestha, Lecturer

Total Cost: Rs. 5,800/-

Abstract:
Smoke hood, a hood placed over a traditional fire or stove, and the cook can access the stove through a front opening. It is a hood model which is used to remove the smoke more efficiently and effectively from the indoor household during cooking. With simple design and easily available resource and raw material used it can replace traditional chimney as it is more efficient in removing the indoor air and hazardous smoke from the surrounding. It uses the principle of buoyancy where the hot air is less dense than the colder air. So the hot air rises up which gets passed through the flue towards the exit removing the smoke and the indoor pollution.

Figure 1 CAD Design

Figure 2 Testing of The Smoke Hood

DESIGN AND FABRICATION OF MECHANICAL DUAL CAN CRUSHER

Group Members: Dipak Khadka, Kushal Karki, Manju Tamang, Manoj Rai

Email: samuelchronic111@gmail.com

Supervisor: Mr. Malesh Shah, Lecturer

Total Cost: Rs. 7,300/-

Abstract:
This work discusses the development and fabrication of mechanical dual can crusher for portable purposes that provides a step forward with the same motive for the re-utilization of the used aluminum products and also to prevent the environmental degradation. This device is an environment-friendly device that crushes two aluminum cans at a time. This device utilizes the mechanical strength of the steel to crush the aluminum. A metal shaft is connected to the circular metal plate which in turn is connected to the sprocket system so that the torque produced by the motor is imparted to the sprocket. The sprocket thus moves rotating the circular plate and thus providing linear motion to the metal shaft that crushes the cans. This device uses the automatic-feed mechanism so that the cans are continuously fed to be crushed. This device if given a proper platform, then can reduce the environmental expense of degradation to some greater extent.

Figure 1 Final Assembly of Dual Can Crusher

Figure 2 Can Crushing Unit

DESIGN AND FABRICATION OF TILT AND TURN TRI-CYCLE

Group Members: Kanchan Acharya, Prakash Prasad Dahal, Rohan Maharjan, Rupan Giri, Sujan Budhathoki, Umesh Thapa Magar

Email: mrj_rohan@yahoo.com

Supervisor: Mr. Binaya KC, Asst. Professor

Total Cost: Rs. 8,970/-

Abstract:

The Tilt and Turn Tri-cycle is basically a three wheeler cycle working on mass shifting phenomenon. Unlike conventional bicycles, it has three wheels, and the turning phenomenon is accomplished by the transfer of weight of the rider instead of the handle. The balancing of the tri-cycle is explained by the pendulum analogy and the steering mechanism by "Ackerman turning mechanism". Considering the advantages of recumbent cycle for ergonomic performance, this vehicle presents an excellent mode of transportation for short to medium distance commuting. The cycle is an excellent means for commuters to reduce energy consumption, low traffic density and maintain physical fitness.

Figure 1 Final Fabricated Tri-Cycle

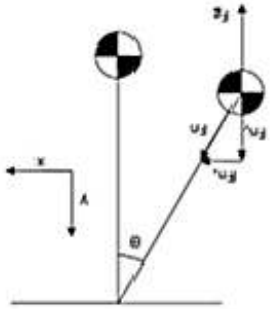

Figure 2 Pendulum Analogy

DESIGN AND FABRICATION OF BOX TRANSPORT MECHANISM

Group Members: Aashish Adhikari, Dibyank Kumar Singh, Prabidhi Adhikari, Rajeev Pandey, Sunil Kumar Mahato

Email: prabidhiadhikari16@gmail.com

Supervisor: Mr. Gokarna Poudel, Senior Instructor, KUTTC

Total Cost: Rs. 4,950/-

Abstract:
This work aims for the utilization of kinematics synthesis (type, dimensional and number) to fabricate a working physical model of an eight link transport mechanism. The mechanism to be developed in its simplest form would perform the function of transporting boxes/articles which are being fed onto two rails and are moved ahead one by one. The eight bar mechanism allows moving more than one article as compared to its four bar counterpart and its application lies in manufacturing, assembly and packaging.

Figure Fabricated Box Transporter

FABRICATION OF RECHARGEABLE BATTERY POWERED LAWN MOWER

Group Members: Aashish Karki, Ganesh Giri, Manup Khanal, Ranjeet Kafle, Tapan Gautam

Email: kafleranjeet65@gmail.com

Supervisor: Mr. Anup KC, Lecturer

Total Cost: Rs. 5,199/-

Abstract:
The design objective is to come up with a mower that can be operated on both AC as well as DC source avoiding the consumption of fuels like petrol and diesel. The heart of the machine is a battery-powered DC electric motor so that no other engine is involved. The charging unit comprises of a 12 V alternator. High lift blade is chosen so that the clippings could be bagged. Since a rechargeable battery is taken as a source of energy, it highly focuses on operation at conditions like power cut. It exemplifies the concept of green energy.

Figure Fabricated Lawn Mower

FABRICATION OF A WORKING MODEL OF AN ESCALATOR

Group Members: Prashanna Bajracharya, Prasil Adhikari, Rajesh Dhungana, Rijan Niroula, Saurav Adhikari, Saurav Bhattarai

Email: its.prashanna2013@gmail.com

Supervisor: Mr. Pratisthit Lal Shrestha, Lecturer

Total Cost: Rs. 3,500/-

Abstract:
Climbing stairs has always been difficult task for old generations. Nobody likes it when it comes to climbing stairs repeatedly. Escalators have been quite a good solution to this problem. This work has been concerned in study, design and fabrication of a working model of an Escalator. This work focuses on study of chain drive system for working of the Escalator. The chain sprocket system is fitted in the wooden shaft which in turn is driven by the help of motor.

Figure Fabricated Escalator

WASTE BLENDING MACHINE

Group Members: Aditya Malla, Anjan Raj Kharel, Ishat Nepal, Ritesh Pathak, Sarad Basnet, Subrat Giri

Email: ritesh.pathak1821@gmail.com

Supervisor: Mr. Pratisthit Lal Shrestha, Lecturer

Total Cost: Rs. 5,000/-

Abstract:
The core part of the product is AC motor of 1/12 HP so that it can blend large pieces of kitchen waste. Clip blade is used in angle making cross shape with upward and downward pointing, rotating the waste towards the center of blade for efficient blending. It is fabricated to promote the green energy. It helps to accelerate the process of composting, resulting in efficient green manure and can be used to produce the paste for production of bio gas. It can take input of 40 liters of kitchen waste and is handy for daily use.

Figure Waste Blending Machine

FABRICATION OF MECHANICAL COUNTER METER

Group Members: Ashutosh Kumar Verma, Avinav Aashish, Divya Darshan Tiwari, Prajan Shrestha, Ram Chandra Oli, Siddhartha Baral

Email: abhi.aashish13@gmail.com

Supervisor: Mr. Anup KC, Lecturer

Total Cost: Rs. 2,735/-

Abstract:
The Mechanical Counter Meter is used for making counting easier. It consists of numbered wheels marked from 0 to 9, rotated by the help of gears that enables us to count up to the highest 3 digit number. However, the number of digits it can count relies upon the number of numbered wheels used. It is basically made up of Ply-woods and soft woods, wheels put together by metal shaft and the framework by using nails and screws.

Figure Fabricated Counter Meter

MECHANICAL WASHING MACHINE

Group Members: Harisharan Chaulagain, Jenish Malla, Krishna Bista, Rishabh Thapa, Sagar Dangol, Shantam Malla

Email: rishabh.thapa95@gmail.com

Supervisor: Mr. Krishna Prasad Shrestha, Lecturer

Total Cost: Rs. 4,500/-

Abstract:
Mechanical Washing Machine was fabricated to provide easier way to clean clothes by using chain drive mechanism to transmit power. Rotating the pedal of the cycle rotates the driven sprocket rotating the cylinder to clean clothes placed in it. This work includes the details of fabricating the washing machine and the materials used for fabrication.

Figure Fabricated Washing Machine

FABRICATION OF CONTINUOUSLY VARIABLE TRANSMISSION MECHANISM

Group Members: Aayushman Pariyar, Anish Shrestha, Kritika Bhandari, Nearoj Upreti, Pratikshya Tiwari, Rachan Puri

Email: kbhandari522@gmail.com

Supervisor: Mr. Netra Jung Karki, Instructor, KUTTC

Total Cost: Rs. 12,500/-

Abstract:
Continuously Variable Transmission (CVT) helps the engine to maintain ideal RPM regardless of the speed of the vehicle. It provides quicker acceleration simultaneously delivering superior fuel economy hence reducing emissions. The work fabricated, demonstrates the working mechanism of CVT used in automobiles. It helps to understand how the CVT actually varies the transmission ratios and maximize the performance just by varying the diameter of the pulley.

Figure Fabricated CVT

WORKING MODEL OF VERTICAL WINDMILL

Group Members: Amul Dahal, Dilip Kumar Sigdel, Sanjaya Rayamajhi, Sujan Khanal, Suman Neupane

Email: sanjay.rayamajhee80@gmail.com

Supervisor: Mr. Gokarna Poudel, Senior Instructor, KUTTC

Total Cost: Rs. 3,000/-

Abstract:
The work discusses on the fabrication of a vertical axis wind turbine with savonius rotors, which works on the principle of differential drag force. The vertical windmill has very low efficiency relative to other windmill of the same size, but is much more convenient in terms of cost and reliability.

Figure Fabricated Windmill

DESIGN AND FABRICATION OF PEDAL POWERED HACKSAW

Group Members: Abishek Kafle, Bipendra Basnet, Pradeep Rai, Rajan Dhital, Rishab Dhungel, Yuyutshu Karki

Email: yuyutshukarki@gmail.com

Supervisor: Mr. Netra Jung Karki, Instructor, KUTTC

Total Cost: Rs. 4,850/-

Abstract:
Hacksaw machine is operated by pedal which can be used for industrial applications and household needs in which no specific input energy or power is needed. This work consists of a sprocket arrangement, the crank and slider mechanism and the chain drive. Chain drive is directly connected to the hacksaw for the processing of cutting the wooden blocks. The work aims is to reduce the human effort for machining various materials such as wooden blocks, steel and Polyvinyl Chloride Pipes.

Figure Fabricated Hacksaw

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Thank You for your assistance in the making of Aviyantaa'15. We are really exhilarated and like to express our gratitude for your help and support. We believe that we will receive the same kind of response from you in the future endeavors.

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Rishab Thapa (2014)
Saurav Bhattarai (2014)
Yuyuthsu Karki (2014)

Inspiring body, creative head, jovial soul & helping hand




the MENTORS of Aviyantaa

Pratisthit Lal Shrestha

- B.E. in Mechanical Engineering, Kathmandu University (2004-2008)
- Worked at DoME as Teaching Assistant (2008- 2010)
- M.Tech in Thermal Power Engineering from National Institute of Technology, Tiruchirapalli, Tamil Nadu (2010-2012)
- Degree research was on vapor absorption refrigeration system (VARS) with nanoparticles blended base fluid (DMAC)
- Serving DoME as Lecturer since 2013

Anup KC

- B.E. in Mechanical Engineering, Kathmandu university (2006-2010)
- Worked at a Hydroelectric project for a year as Site Engineer
- Master's in Mechanical Engineering from Korea Maritime and Ocean University, S. Korea
- Degree research was on Computational Fluid Dynamics and flow features of Francis Hydroturbine
- Serving DoME as Lecturer since 2013

Malesh Shah

- B.E. in Mechanical Engineering, Kathmandu University (2004-2008)
- Worked as Research Assistant on Solar and Wind based rural electrification for rural communities
- Master's in Environmental Engineering) from Kongju National University, S. Korea
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- B.E. in Mechanical Engineering, Kathmandu University (2006-2010)
- MS by Research in Mechanical Engineering from Kathmandu University (2010-2013). A part of research was completed in Lucian Blaga University Sibu, Romania, under Erasmus Mundus Scholarship
- Degree research was on Improved Cooking Stove (ICS) with focus on upgrading the performance of the metallic stoves by troubleshooting the problems incorporating additional faculties on cooking, room heating and water pasteurization for drinking
- Worked as a part time teaching faculty at DoME during master's degree research and has done several national and international projects on waste to energy technology like Biogas, bio-electrification, ICS.
- Serving DoME as Lecturer since 2013

Aerial View of Kathmandu University Central Campus taken from UAV

Photo Courtesy: Prof. Dr.-Ing. Ramesh Kumar Maskey, 2015

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