

February 2009

STRENGTHS

Cover Story....

We did it

to ourselves....

- Leadership of IIT Kanpur
 - Disaster Management & Earthquake Engineering
 - Guru ki Kalam se
 - India's Youth Energy Power & Potential
- and much more.....

Department of Civil Engineering

Indian Institute of Technology , Kanpur



Society Of Civil Engineers
Indian Institute of Technology Kanpur

20th-22nd February

CivERE

2009
Encouraging Research and Education

The fourth National Conference for
Civil and Environmental Engineering Students



Dear Readers,

Again we are back with STRENGTHS '09, "PITAARA" filled with lots of knowledge, fun and masti; touching every hot and cool corner of Civilian life at IIT Kanpur. This issue is sufficient to show, Why we are 'Zara Hat Ke' from others.

Inside this issue as the cover story 'We Did it to Ourselves' we have focused on the burning issues of global warming and economic crisis; connection between economics and ecology is also revealed and we try to question what is good and what is bad. Apart from this, we have showcased some of the Initiatives where our department has fulfilled its duty of leading the National Community. Along with this we present country's first ever five star green rated building before you i.e. The Centre for Environmental Sciences at IIT Kanpur.

Friends, we are happy to inform you that in this issue we have a special section, 'Guru Ki Kalam Se', to have an exact viewpoint of those Real path makers, our teachers. While turning the pages you'll communicate with each and every significant memory of this year i.e. Survey-Winter and Summer Camps, Stimulus'08, Civ-ERE'09. Keeping in wake the current scenario of Economic Crisis, we have caught up with the SPO Chairman for his valuable advice. Actually now everyone (Civilian @ IITK) of us has realized that STRENGTHS is evolving as the best platform for expression as well as exposure of thoughts. In case it has not then this issue will complete the rest part of the job.

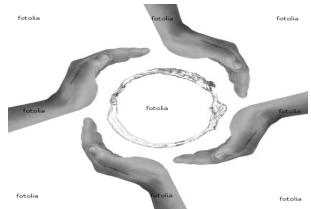
We would like to offer special thanks to our faculty advisor, Dr. Tarun Gupta who has been like a special pillar of Strengths, supporting us at each and every stage of this magazine and turned the work into nothing. We don't think that we can get a better place to convey our regards to our alumnus, who have been an inseparable part of our family. Also we are short of words for the appreciation of the efforts of the student community as this year the response has been tremendous greater than ever seen before. We promise that this issue will rock with all its features into your heart.

Thanking You All,

Editors,
STRENGTHS'09.



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Motivation — Keep Writing...



The world is passing through a major financial turmoil, and its effects are being felt everywhere. Civil Engineering industry is also experiencing the ripples of this economic meltdown. In these troubled times, students of civil Engineering need to be patient and optimistic. Surely the better conditions would prevail. The need of the time is to introspect and to test your emotional strength and self-belief. You should also seriously reconsider going for higher education to hone your technical skills. For our students, this option has been on the backburner for a long time. Strengthen extra-curricular and soft skills for enhancing your overall personality. These troubled times would surely give you immense strength and courage to face the world and come out with flying colors.

On behalf of CE faculty members, I also wish to convey our congratulations to the STRENGTHS team for bringing out another masterpiece.

Wishing you a very successful and eventful new year...

- **Dr. Onkar Dikshit**

In the age of internet, videogames, and satellite channels, finding time for reading and writing becomes quite precious. It is heartening to see a bunch of young souls so passionately involved in bringing out this issue of Strengths 2009. It was indeed a wonderful experience to interact with the Strengths team members. Again, this year I did no more than motivating them and providing a platform to weave their thoughts together. They took quite sometime to decide about the title theme. I do hope that you all will enjoy reading it.

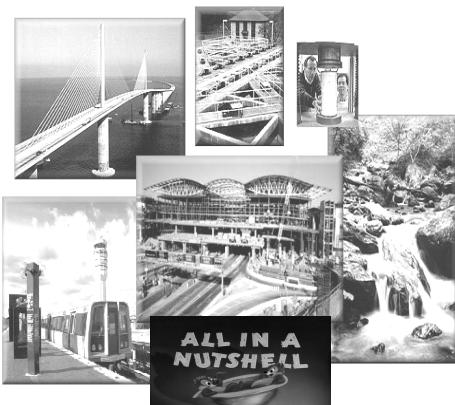
I must thank all the students who have contributed their articles, poems, photographs etc. for Strengths 2009. This year we got an overwhelming response right from the Y3 to Y8 batches. I hope many more students would come forward in the future also to express and share their thoughts with the Civil Engineering community. I would like to thank all the faculty and staff members who have helped us in various ways towards publication of Strengths 2009.

- **Dr. Tarun Gupta**

Civil Engineering – In a Nutshell

If I could have solved 6-7 more correct problems in JEE Is my rank good enough for an electrical or computers? Now the question was not, which department will I join but the great dilemma, which department should I join, was there to confront after having done with the "Exam" of a lifetime !!

Have you determined to be a hard core engineer ? Do you want to be a part of one of the oldest engineering professions of the world ? Or, do you want to serve the country, alongside the Army ? Then, what you have chosen is The Best, Department of Civil Engineering.



Ancient feats such as the building of the Egyptian pyramids and Roman road systems are the early achievements of civil engineering. A Civil engineer can be found in all areas of the society from small private contractors to municipal agencies, federal government organizations, and the military. Civil Engineering is everywhere –from the be seen in the form of multilane roads “bridging” the gap between two different regions, their people and culture. There is not a single moment when we do not come across the miracles of Civil Engineering; a profession which makes you think “*Man can do anything*”, smallest homes to the grand villas, admired malls and complexes.

If you have ever thought of CE as one of the trodden professions, apply some stress again to your mind. The dried and doomed CE department is back again and is better than the best, it has ever been. Now, it is amongst those departments which have stolen limelight of technology and there are no chances of change in this status as long as readymade homes, towns, roads, bridges and tunnels etc are not there in the scenario.

There's been a boom in the job prospects of CE and the renaissance has just begun to say the least. It'll probably last longer than expected because in India the demand of CE is going to be higher than the supply, call it the balancing act. It's high time that we as CE and presently fresh moulds of “concrete” harden without any external load of “superiority” or MBA or MS but with feeling that we are going to be the providers of one of the three basic necessities of life namely ‘*roti*’, ‘*kapda*’ aur ‘*makan*’ and no rewards for guessing which one !!!

The fact of the hour is that the investment banks which are considered to be the most important source of financial inputs to the IT companies are jeopardised because of the “bubble-burst” or in simpler words are either closing down or converting themselves to retail banks. No offence is intended when one says that the above has been a substantial reason for the IT sector downfall the consequence of which has been a steep fall in the intake of manpower and in many cases even to the extent of sacking current employees !!! CE is more than just a 4-year grilling. It comes as a complete package inculcating numerous qualities in the process. It is the first step towards transforming an under-graduate to a complete professional by the time he is a graduate. One of the most important words in a CE's life is “**OPTIMISATION**”. Unfortunately in everyday life a synonymous word “**bargaining**” is used whose importance all of us understand clearly. ***Caution:*** Optimisation is a word with a much coarser prospective and meaning bringing together conditions which may be poles apart and yet giving the desirable outputs.

Civil Engineering is one of those fields which gives you the satisfaction of having worked for the society at the same time quenching the intellect, being in direct contact with labours, machines, land and nature. It makes one to learn from facing challenges in real life. For all those who just don't want to get into core constructions and think CE is only about buildings, you have it wrong; perhaps you should look maybe Fire control engineering, systems !!

We, Civil engineers build so, we quietly shape the history cannot imagine life without con-public's health, safety and stan- engineers are creative, people-serving and problem-solving leaders who make our day to day life.

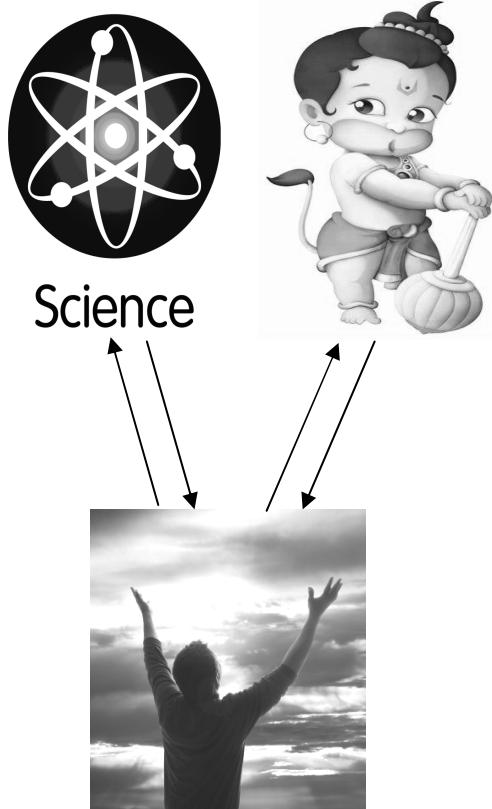
"Do you want to be a part of profession which has a history unsurpassed and a future uncontested ?"

at environmental engineering or or how about transportation sys-

the world's infrastructure. In doing of nations round the world. We tribution of civil engineers to the dard of living. Simply stated, civil

- **Smit Chandra**
B.Tech - 2nd

God Is Necessary



Lor' O my Great Lor',
See how the technological trinkets galore;
Isn't man striding too fast
And tampering with the Machinery of Your?

Bomb, pollution, automated loneliness:
Doomsayers abound in range;
Aah! But even Death now to man seems,
A mere molecular change.

When an apple fell and Newton
Exultantly gave the theory of Gravitation,
He but answered why the apple fell;
Did he ever bother who the One,
Was that made the fall, Who the Hell?

The Chaotic Boundary Principle defies God;
Stronger version of Anthropic Principle even more so,
God is still groping to find an abode in the T.O.E*,
Why is it that we think better we know?

By thinking we have all the answers,
We are nothing but chasing a mirage;
Only He is the supreme mentor,
The supreme scientist, the supreme sage.

That all I have said, a warning. Upon it
Give your mind some exercise,
Leave a little space for God,
For God does not play dice.

* T.O.E - Theory of Everything

- **Rohan Parakh**
B.Tech-2nd year

India's Youth Energy - Power & Potential

Energy, Power, Potential. Honestly remind me of the Kinetics I learnt in Physics at school. And then India's Youth. Now, that is but ME. So then, I have energy, power and potential in me, huh? Wow! But what to do with it? How to use? And where? Can't I just brush it aside, and go on? And if so, for how long? Fortuitous tides of thoughts sweep me into ecstasy...

"The young do not know enough to be prudent and therefore they attempt the impossible, generation after generation". Evidently fathomed to be adolescent but astute, reckless and yet responsible, the Youth community has hitherto been the least empathized and most disregarded of all, with every authority resting in frail, outworn hands. Not anymore. The World has now woken up to the fact that its lone savior, if there was one, is this buoyant and bounding pulse of flush, vernal enlouss eyelids of forlorn old-echoes of long-departed attitude with which they lems is the need of the conscious of its rights, have a stand on everything tion, political volatility, N- (read: Mumbai terror at-breakdown, for that mat- mettle across segments ranging from education, research and technology, industry, entrepreneurship to socio-economic transformation, rural development, entertainment, media and sports. Is-sues in impact areas such as gender equality, access to education, employment prospects, health issues, input into decision-making, religious tolerance and conflict resolution, all of which affect lives of the young population directly are being addressed. No wonder when the Queen calls upon the Commonwealth Nations to deliberate on boosting youth potential or when Janneh ennobles them as 'The best bequeath for the future'!



ergy, and not the pendula-
ge pining in mocking
youth. The intrepid, go-get
confront formidable prob-
hour. Today's youth is
power and privileges and
be it the crippling infla-
deal, heightened terrorism
tacks) or even LHC's
ter. They have proved their

mettle across segments ranging from education, research and technology, industry, entrepreneurship to socio-economic transformation, rural development, entertainment, media and sports. Is-sues in impact areas such as gender equality, access to education, employment prospects, health issues, input into decision-making, religious tolerance and conflict resolution, all of which affect lives of the young population directly are being addressed. No wonder when the Queen calls upon the Commonwealth Nations to deliberate on boosting youth potential or when Janneh ennobles them as 'The best bequeath for the future'!

And in this context, I fail to adduce a more fitting example than the Youth of India. The country, 61 years post Independence, boasts of 9% GDP growth, agricultural boom, tangible strides in technology and infrastructural growth, an upsurge in economy not forgetting the successful launch of Chandrayaan. Big deal! These statistics immediately get enfeebled against the deep waters the country is wading in. Plagued by poverty, beset with illiteracy, charred through corruption and raped by terrorism, these blatant truths have scorched the very face of Mother India. We celebrate the boom in economy, but what about economic equality? Isn't the distribution of assets becoming increasingly disproportionate when it should have been the other way round? Let it be driven home: This country is on its way to doom and there's very little to hope for; that is unless we call upon to tap fully the latent potentialities of the future of tomorrow in becoming full and active partners in the development process. Budding scientists and engineers, IAS officials, sportspersons, media persons, army personnel — these are the stalwarts who strive incessantly towards molding up the nation's prospective physique. Having made their mark on the professional front, youngsters are making large social impact as well. Giving up lucrative jobs and avoiding migrating overseas, they prefer to stay back and start off their own entrepreneurship, are fancying ISRO to NASA and choosing IIMs over Harvard.

With 30% of the world's illiterates coming from our country, illiteracy has established itself to be a principal handicap India is drawn against. Education acts as a refuge in adversity, It

empowers. If the development of a state is to be people-centric and the growth whole, the citizens should be stimulated through education. And the youth is cognizant of this reality. Initiatives like Teach India, Make A Difference (MAD) and Lead India, national youth organizations and NGOs, forums and movements speak up for how they are unanimously joining hands to improve the existing sorry state of affairs. All this, keeping aside dispiriting notions of secularism, regionalism and monetary returns, and instead allying collectively on one platform, one vision in mind. Reciprocally, there is a role the Government has to play too. To start off with, education at all levels should be made accessible to all and sundry, by increasing resource allocation to education and facilitate grants through the co-ordination of UNESCO. Analysis and review of formal education policies must be carried out through involvement of the youngsters as both creators and beneficiaries of good-quality schooling. Non-formal education needs to be recognized as complementary to the formal counter-cultural development of individual Ministries of Education with NGOs in emphasizing peace, human rights.

Okay now, pictorial billboard reading 'tressesque destinations', children, some lapping open sewers while their money being 'redistributed' to political activists or blown on some minister's foreign jaunt or better still, sucked into the black hole of hair-brained schemes like NREGS in the name of helping the poor. And then indifferently, we tend to marvel- Dude, where goes my tax-money? With the plucky media stepping in, transparency has, no doubt, enhanced, but is no way sufficient. Poverty still perseveres, corruption nonetheless persists. The young must be enabled to partake in decision-making at all levels, organize themselves in youth NGOs, student and trade unions, political parties and creation of mass media, thus touching upon political, economic, social and cultural life. Furthermore, imperative youth organizations, in collaboration with Government agencies, IGOs and financial institutions need to be established where they do not exist, and strengthen existing national and regional youth networks and agencies. Such agencies, autonomous in planning, decision making, and implementation, should act as monitoring bodies to evaluate national progress. Altogether with due consideration to the background of target groups, and appropriate training and follow-up should involve local community members. The platforms should respect each member organization's independence and operate based on the principles of solidarity and democracy, the very doctrines the Constitution is drafted upon.

From the past 2 years or so, terrorism has spread its claws through India illimitably, but we've been unable to zero in on it. We, the people, are left with only one mantra: Womb to Bomb to Tomb. No serious allegations intended but the substandard Intelligence system of India requires a proper overhauling. A trained task force consisting of security personnel, doctors and student volunteers, who want to do their bit for the country, should be bred, in every zone, and always kept on alert so that they can rush at the site of attack to assist the victims. No such emergency plan is available and the Government must earnestly contemplate over this. Let terrorism be thought of as fiercer version of repressive despotism. It's a shame that our soldiers are underpaid while the likes of Kareena usurp crores for doing an item number. Martyrs like Karkare, Salaskar, Kamte and Unnikrishnan, do stir up the gradually mounting sentiments of animosity amongst the youth and infuse passions of patriotism. Let this not just dissipate away. Provide



part, it being integral to individual and society. The could work in partnershiping universal concepts such and environmental protec-

ture this: Just alongside a 'Maharashtra-Land of pict-you witness half-naked (and few defecating) inside mothers 'wash' clothes in pose this: Your hard-earned

incentives to the recruits of physical security agents namely NSG, ATS, paramilitary force and the Army to egg in a plethora of young blood. Influx of capable young leaders akin to Rahul Gandhi and Jyotiraditya Scindia ought to be made through country-wide talent search campaigns, assessing each one's USP values, commitment and teamwork. Thus, we can amass diverse talents as one could be skilled at training, the other an efficient orator, another may be endowed with good managerial skills, and some may have a grasp of grassroots-level politics or understanding of bigger issues as their forte, and each one could contribute accordingly.

Talking of troubled seas, India hasn't yet been able to extricate itself out of the shackles of the seemingly perpetual social issues. Peccant woes of child-marriage, female feticide, dowry, xenophobia and population explosion remain to hinder progress. In the past decades, pollution & related greenhouse effect and wildlife protection have also surfaced up to be critical. Burdened with debt crisis fuelled by present financial catastrophe, the Youth itself is experiencing the consequences of the on-going cuts in government expenditure in human services, coupled with escalating youth unemployment. We keep hearing of frequent suicides amongst teens and in premiere institutes like IITs, but never cared enough to nip it in the bud. Real and sustainable solutions to these problems include reduction/exemption of external debt, trade agreements respecting right to work and decent working conditions, fulfillment of long-term plans, strengthening youth focal point institutions within the governmental structure and rightful access to information. Youth issues should not be treated in isolation, but mainstreamed into all policy-making deploying the cross-sectoral approach. Youth policies should be formulated via a thorough consultation process between the government and the national youth NGO platforms as well as other stakeholders as equal partners in that process. The youth can play a role by voicing against child-marriage, cold-shouldering dowry, proper domestic treatment to house-wives and shunning away from child-employment. Combat against the global warming, poaching and the subsequent perishing of wildlife should also form part of the national agenda.

Having emphasized on youth involvement all along, I won't hesitate to admit that we need the guiding hand and inspiration of our elders too. Devoid of their time-worn experience, rich skills and supreme vision of veterans like Dr.Kalam, we can't hope to achieve much. This calls for mutual reverence and our responsibility towards service to this experienced lot. Hence, it is vital that we build democratic leadership, civil society and social capital for the 21st century on the bricks that our forefathers have laid down for us.

**- Rohan Parakh
B.Tech-2nd**



“ijasanesa dda ipyaā vaorakogait tlfanal.
yah jalana ka jvaar calal]fnaatI pKr javaanal . .
yaak har jaatohMlaikna yaalana kBal na hara.
ek inainya kl baat nahIMyah icar sava-hmara. . ”

- Attalibhar vajayad

We did it... to Ourselves

- T.V.N Srinivas, B.Tech - 4th Year
Vivek Agarwal, B.Tech - 2nd Year

Since the good old days of wheel and fire, human civilization has been trying to move towards a better and more comfortable world. May it be for the quest of knowledge, curiosity of knowing the outer world or the desire of making the life better for the next generation, man has been playing with the things around without knowing what *else* his play could do to him. Gone is the era when we could have relaxed made mistakes and said well “mistakes are a learning experience.” Through this article, we bring to you, critically and comprehensively, two examples of climate change and present economic crisis, and emphasize that the tipping points may not be far ahead unless acted upon immediately.

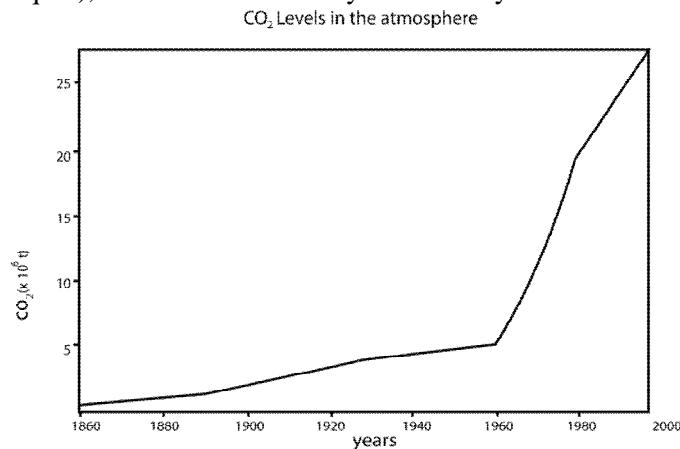
Man has been playing with the things around without knowing what else his play could do to him.

Climate change: Future could well be a thing of the past

The biggest issue with this problem is the rate at which it happens. From scientific studies we know that the ice ages have started in a span of just 10 years! The sheer rate of changes is so fast that we don't get time to think, reflect and then act, and this is attributed to our poor understanding of Climate Change. Take for example, recently it was understood that ice reflects 90% of light falling on it whereas water absorbs 90% falling on it. This very reason is responsible for exponential increase in warming.

What is the problem after all ?

We are altering the composition of the atmosphere by adding green houses in huge proportions, which are emitted from the vehicles that we drive, industries using old techniques (just because they are very profitable or simply because they do not have access to the new techniques), the “Great Oil Lobby” and many more such reasons. Not only is this melting the glaciers (mind you we have lost a lot of them in the last few years, and studies show that they will be completely off the map in the next 50-70 years) which are a source of fresh water (40% people survive on this water for drinking) but it is also melting the ice at the poles which would possibly submerge a good chunk of landmass which will force the maps of the world to be redrawn i.e. if someone survives. Not to mention the impact it is having on the ecological cycles of nature, chicks have started to hatch earlier, seasonal cycles have altered causing all sorts of problems ranging from resurfacing of many previously eliminated diseases to destruction of crops and vegetation. Permafrost thawing is causing buildings to fail. The temperature swings that we are witnessing now are far greater than those ever seen the entire history of the earth. The 10 hottest years in recorded human civilization have occurred in the last 14 years.



"As we predicted last year, 2007 was warmer than 2006, continuing the strong warming trend of the past 30 years that has been confidently attributed to the effect of increasing human-made greenhouse gases," said James Hansen, director of NASA GISS.

The “Great Oil Lobby” has already caused several problems (like terrorism, partially) and like those were not enough the problem of “Climate Change” due to emission of green house gases is also partially because of them. The problem is that, there is a great deal of economics behind reducing the green house gas emission. To do so, we will have to reduce the usage of Oil (at least that is what they think) which will obviously spoil the entire “Oil Politics”.

But the truth is, taking action on Climate change doesn't necessarily call for reduction in the use of oil! It calls upon for “cleaner oil” and efficient usage of oil. By adopting better practices we can better the situation.

Economics versus Ecology:

Well when I look at this “debate”, I actually think is there a debate? If there is no Earth there is absolutely no use of the Economy. However, reduction in carbon emissions doesn't necessarily call for an economic loss. Here is an example how it can actually better an economy. Consider the automobile industry in the US, the emission standards of the US cars are so bad that they do not meet the Chinese standards (!) and hence cannot sell their cars in China. Only if they managed to raise their standards they would be able to sell their cars in many other countries. Now I do not think I need to write about India.

Paddy fields release large amount of methane gas to the atmosphere, so do we even stop cultivation?

Having said this, stopping industrialization, motor vehicles etc is not a solution. Paddy fields release large amount of methane gas to the atmosphere, so do we even stop cultivation? Obviously, no, we need to devise simple techniques which do not stop our advancement and at the same time do not contribute to our end. Investing more and more money for new technologies may not be a solution to this problem. This is explained in our last sub article on prioritizing global problems. All that we have to do is make a few lifestyle choices.

- Buy Energy Efficient Appliances like neon light bulbs
- Change your thermostat, use clock thermostat for heating and cooling
- Weatherize your house, get an energy audit
- Recycle as far as possible
- If buying a car, buy a hybrid car
- When you can, walk or use cycle
- Where you can, use a mass transit or bus
- Switch to renewable sources of energy
- Contribute to develop greenery

These few changes in your lifestyle can make the difference. If we don't change things today then “Future might well be a thing of the Past”.

Economic crisis: A better example of human greed

The present economic crisis has led to devastation in all corners of the world. No country has been spared, though the birth of this crisis is confined to a few. The number of people

who lost their jobs is of the order of crores. There have been several crises in the past too. How can we forget the great depression of 1929? After all, if we have created these economic rules, then why do we face such crises?

Well, to answer this question, we need to dig some basic principles of economics. Unlike what we learn in physics since childhood that matter could neither be created nor destroyed, money can be created and destroyed. Let me give an example. Suppose you stay in a rented house for two months and escape without paying it, you are destroying the money. In actual sense, the money equivalent to the rent of two months must have belonged to the house's legal owner who is now deprived of it. This is different from theft. Note here that 'destroying' money does not mean tearing down the currency notes!

Earlier days, gold used to be the standard of money and the prospects of a country were measured in terms of the amount of gold it possessed. But after World War II, some countries fearing their downfall (as the former Soviet Union had loads of gold), changed the standard and made it the US dollar. Hence, US dollar and its associate, the UK Pound started ruling the world. People tried successfully to prove that markets will reach a level of optimum when left free with some pre-assumptions in a theory called the theory of Free Markets.

Deregulations of markets came into picture in 1973 in US and 1986 in UK. People started finding ways to make more and more money by introducing intricate theories of economic

transactions like futures, forwards, options, derivatives etc. These were the complexities initially introduced by some individuals for their personal profit which later spread their venom to the rest of the world. An average consumer could not see what these concepts had for him but still ventured into as it was bringing profits for everyone and prospects for all the countries. These combined with the policies of securitization, brought into the economic policy so much of opacity that no one knew what they were dealing with.



Let us move to understand the term being highly popularized of late, the Sub-Prime crisis. Sub-prime lending refers to the loans given to those who do not have sufficient credit worthiness. In easier words, it refers to the loans given to those who do not have enough resources to repay them. Housing rates in US began to rise in early 1990s. When the people approached the banks for housing loans, banks gave them instantly without analyzing the risk in such lending because even if they do not repay the loans, banks could sell the house to get back the money because the housing rates are rising. This belief made the banks give away more and more loans to increase their assets. Where did the banks get this lot of money? Banks actually took loans at much cheaper rates from several places to cater these loans which pay them higher interests and thus the bank could make more money. The NINJNAs- people with No Income, No Job and No As-

sets got benefitted enormously with such loans and the intermediate commission agents also got huge profits. Now as the banks did not actually know whom they were lending to, had no control

over what was going on. In fact, no one had any control over what was going on. Banks did not know what their assets were. But everyone was happy because the house rates were going up and up. Realizing that they have made a mistake, banks started selling their assets (loan securities) to other places and sometimes even other countries, thanks to the securitization policies brought in by the government. \$600B was involved in such loans by the end of 2006 and a total of \$23T was brought into the game. By then, because of the over ten year long boom in housing construction, the demand became less than supply and the prices fell down all of a sudden! Also, as expected, the loan borrowers could not repay them. The result, gargantuan amount of money was destroyed. Because of the extreme complex and opaque natures of the economic transactions, money was not just destroyed in banks but everywhere in the west.

But Indians are extremely conservative about taking such steps. As the RBI did not fully understand these policies, it did not entertain them in the Indian market. Then why did crores of Indians lose their jobs? This is because of the simple reason of connectivity. The countries in the world are dependent upon each other for many reasons and a significant change in one nation brings it to the other. As a simple example, more than three fourths of the revenue of Indian IT industries comes from the western countries which now cannot afford many projects because of the credit crunch. Due to this simple reason of connectivity, millions of Indians have lost their jobs in the imports-exports sector. Due to this very reason the GDP growth rate of the nation is slowing down.

Looking at this, if we have to ask who is responsible for all this, the answer would unanimously be 'WE.' So, should we not have messed with the economic policies? The answer would be yes and no. Yes because it is these very policies which brought it the prosperity to several nations of the world. No because it is the opacity of these policies which brought in the present crisis and made it almost impossible for the authorities to act decisively.

Finally, it has to be noted and understood that every change brings in some good and bad. Nothing comes for free. For example, a war booms an economy but would also destroy a lot of resources. We do not start off a war to boom an economy because we can directly see its implications. But what if we can not do so? Hence, whether to welcome the change has to be decided after working out its net worthiness. This is the hard irony of life. This principal is easier said than done in the context of economic policies and climate change as it often becomes impossible to quantify the goods and bads of it. As we try to emphasize, we never know when and where things tip. The question to be asked is, is it advisable to stop a nearer good in the fear of a farther bad?

We do not start off a war to boom an economy because we can directly see its implications. But what if we can not do so?

Prioritizing Global Problems

The world we live in is sailing through many terrible problems like Global Climate Change, Economic Crises, HIV, Terrorism, Malaria etc. In an ideal world we would wish to solve each and every problem at one go. But in this real world where we have *limited resources*, it becomes extremely important to prioritize our problems and then step ahead to solve them one after the other. On the same mission was set the Copenhagen Convention of 2004 where thirty of the world's best economists started prioritizing the top seventeen problems humanity is facing.

Why economists and not climatologists or malaria experts? This is because climatologists can answer what has to be done with the climate, a malaria expert would give the measures to be taken to control malaria but if the question is to prioritize them based on the available resources, none of them could answer. This is the job of economists.

If we ourselves have to make such a list, it is an undeniable fact that majority of us would try to solve the Global Climate Change before approaching any other crisis. But surprisingly, the convention when prioritized the seventeen problems in the list, came up with climate change as the last priority.

1. Diseases: Control of HIV/AIDS
2. Malnutrition: Providing micronutrients
3. Subsidies and trade barriers
4. Malaria
5. Malnutrition: Providing new agriculture technologies...
17. Climate change

Now what possibly would have made them take such a step which would look extremely weird to a common man? The convention does not say that global warming is not happening or the climate change is unimportant. But what it tries to put forward is that, what we can do about it is very little with very high cost. For example, practicing the Kyoto protocol of 1997 would cost the world \$150B an year. Yet it would do very little good for the future. But for half that amount, UN estimates that we could solve all the other major basic problems like clean drinking water, education, basic healthcare to every human being on the planet. \$27B for next 8 years could help prevent 28million new cases of AIDS. 2 Billion people get affected with malaria every year. \$13B per year for 4 years will control malaria and bring it to half.

100 years later, Bangladesh (for example) would be very rich, not to mention, the rest of the world would be richer too. But now the actual question is that do we want to invest in something that would help a rich Bangladeshi 100 years later or in something that would help the poor Bangladeshi right now. So we have to ask ourselves whether we should spend a huge amount doing very little good or half the amount doing an amazing amount of good. Thinking back on 2009, a rich Bangladeshi might think this way, “How odd that they cared so much about helping me a *little bit* through climate change and cared so little about helping my grandfather and my great grandfather whom they could have helped so much more and *who needed* their help so much more.”

Hence it is *we* who have to decide whether to invest billions and trillions into such problem solving measures and still provide very less to the future generations or make some small changes in our lifestyle, needs and necessities and contribute greatly to our sons and grandsons.

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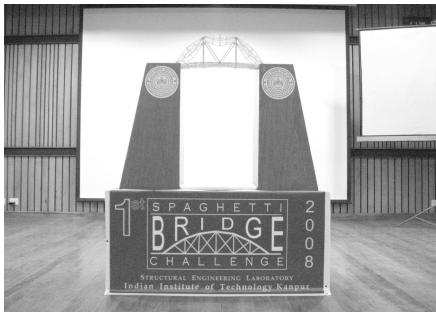
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Spaghetti Bridge Design Challenge



"A great bridge is a great monument which should serve to make known the splendor and genius of a nation; one should not occupy oneself with efforts to perfect it architecturally, for taste is always susceptible to change, but to conserve always in its form and decoration the character of solidity which is proper."

- Jean Peronnet

For the first time ever in the history of IIT Kanpur, the course template of CE 222 included a project, The Spaghetti Bridge Design Challenge. Thanks to the outstanding creativity of Prof. D. C. Rai, the students got a chance to personify their theoretical knowledge and learn the basic concepts of construction management.

The event was a test of our ability to strike a balance between the safety and economic aspects of structure designing. 'The Spaghetti Bridge Design Challenge' was an event of planning and innovation. It provided a stage to display our creativity, design, analytical skills & engineering aptitude! The aim was to design and build a bridge using spaghetti sticks and then test it for failure. And not only this, the complete analysis, bending moment diagrams and expected strength of the bridge were to be provided in the form of a report. The students had to analyze the whole project using SAP 2000.

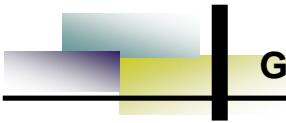
Sponsored by Computers and Structures Inc. India and headed by Prof. D. C. Rai along with the students under his mentorship, the event proved to be a hit. During the time, it was most talked about event in the whole of campus. After the whole semester of intense planning and lot of hard work, all the students (in groups of four), along with their bridges, technically sound, dimensionally perfect and innovatively designed, waited eagerly for the day, the day when the bridges had to take the final leap.

The testing was done in the Outreach building. Prof. C.V.R. Murty was the honorable chief guest for the occasion. The hall was full of students anxious to see their bridges perform to their capacity. The bridges were tested in the ascending order of their weights. The first team with the lightest of them all came, keeping the 200 gm blocks on the plank, everybody's heart was pounding as to what is going to happen next, the pile was rising and suddenly it gave away, the first bridge finally went out. All were cheerful. Even the chief guest liked it.

As the time passed, groups came and went, watching their creation getting tested to its ultimate capacity. There were all sorts of bridges ranging from truss to arch design. During testing of few, even Prof. Murty got excited and raised his arms in excitement. Some performed good and some not too good, some bridges gave away from decks and some from their trusses, one was even rejected for not fulfilling the dimension requirements of the clear height. There were all sorts of efficiencies ranging from 81 which received the first prize to 37. But eventually the event left everyone satisfied and happy.

The event proved to be a very big hit, to the extent that, this year the event was launched in Techkriti '09 as National Spaghetti Bridge Design Challenge, presided over by Prof. D.C. Rai along with the help of the Civil Engineering department, IIT Kanpur. We as students just hope that the event becomes a tradition and is further planned every year.

- **Archit Agarwal**
B.Tech - 3rd



Giving Back... What We Give To The Society

In the world where the problems are getting more technical and complex, it easily occurs to one that the best avenues in a country to deal with such problems are its top most academic institutions. With IITs being regarded as the pillars of Indian technical education, it is not too much to ask them to address such issues of national and international importance. In fact, it is one of the prime reasons why the IIT system had been introduced in India.

This article would present before you some of the most remarkable contributions made to the nation by the Department of Civil Engineering at IIT Kanpur in the last one year. In the first article, Dr. Bharat Lohani explains his vital role in the Chandrayaan Mission, one of the most celebrated and historic works in Independent India. In the second article, Dr. Rajiv Sinha explains the Kosi Mega floods of August 2008, the loss it brought to the country and the role of IIT Kanpur in the background research and technical advisory and in the last article Dr. Vinod Tare writes about the prestigious Green Toilets project and how it could revolutionalize the way we look at the waste recycling and disposal.

1. Chandrayaan-1: India's first mission to the moon

- Dr. Bharat Lohani, Karthik Nivas

Strengths: Please brief us on Chandrayaan-1 and its objectives.

Dr. Lohani: Chandrayaan -1 is India's first space probe sent to the moon. It is basically a high resolution data capturing vehicle sent to the lunar orbit. Its orbit is at an altitude of 100 km above the lunar surface and it has a life span of about 2 years. Its objective is to know about the physical, chemical and mineral composition of the lunar surface. For this purpose several sensors have been attached to the satellite. These sensors detect light in its various wavelength bands for example, in the visible, X-ray, gamma ray bands, etc. These sensors are of two types. First type is the photographic sensor and the other is the geometric one. The high resolution sensors installed in this mission are currently among the best in the world.

I have been associated with the LLRI project of the mission (which stands for Lunar Laser Ranging Instrument). Its purpose is to send laser pulses to the lunar surface which are then reflected back. From the time lag between transmitted and received signals, it is possible to calculate the distance of the point on the moon's surface from the satellite and map its coordinates in an absolute coordinate system. From this data collected, it is possible to study the topography of the surface, i.e., the presence of craters, rocks, etc. and hence on the whole to get a complete 3-dimensional picture of the moon's surface. This is a very important part in the whole mission.

IIT Kanpur's involvement was in the development of a simulator for the LLRI. It is used to simulate/replicate the topography of the moon's surface in the laboratory with the help of a model. The simulated data may help in understanding the actual data sent from the Chandrayaan-1. For example, the simulated data can help develop approaches which will be used to extract information (e.g., craters) from actual data. From our lab Prashant, Abhishek and Aditya worked in this project.

Strengths: Is the satellite a fully indigenous one ?

Dr. Lohani: Any satellite involves the use of very specialized and intricate instruments which are very difficult to be completely developed by a single country. Though most of the development of the satellite has been done by the ISRO, but certain necessary instruments made in foreign lands were used in this mission. As far as the development of the ground control systems, the maneuvering, control of the satellite and its design are concerned, these are completely indigenous. There has also been participation from the other nations in this mission. They have installed sensors of their own for conducting further research.

Strengths: What has been the most daunting hurdle in your experience in this mission ?

Dr. Lohani: The developed simulator needs mission data and moon parameters. But these very parameters proved a hindrance, as such details, for example, the moon's exact radius, etc, are not readily available. Another problem was the poor coordination between the ISRO and the involved project members which was apparently because of their being busy in the mission. This delayed the exchange of information.

Strengths: Dr. A.P.J Abdul Kalam was one of the first scientists in the country who encouraged industry-academia partnership for the simultaneous development of technology. What are your comments and where do you think there is scope of improvement in this regard ?

Dr. Lohani: The role of academic institutions in such massive projects like Chandrayaan-1 can definitely not be played down. As whenever R&D comes into question, academic institutes are better equipped to handle it as they have both manpower and newer ideas. In case of Chandrayaan-1, there has to be good interaction of ISRO with the academia, though I am not aware of the quantum of these.

Regarding the academia-industry interaction, in general, the interface between the industry and the institute has to be established on a partnership basis which facilitates more freedom for the institute to get involved with the market realities. Institutes in other countries enjoy more freedom and confidence of both the public and private sectors. In India, however, the drawback has been the lack of such initiatives on a larger scale. More participation in such projects would help to tap the potential and energy of young India which otherwise in many cases go unchecked. Moreover, the time frame offered by the industry to the institutes does not support the cause either. Institutes should be offered long term projects for better and more advanced research into the requirements in these fields.

Strengths: What are the opportunities in space research concerned with civil engineering ?

Dr. Lohani: The basic construction of launch sites, structure for the satellites and payloads and the special construction material used, involve various aspects of civil engineering. More importantly, a civil engineer should utilize the remote sensing data received from satellites in their problem solving.

Strengths: What is the ISRO-IITK cell and what are its objectives ?

Dr. Lohani: The ISRO-IITK cell is basically a unit which mediates between the ISRO and the faculty members who may be interested to work in such projects. This cell also helps in providing funds for such projects.

Strengths: What is your take on research at the UG level concerning such projects ?

Dr. Lohani: Yes, I feel that undergraduate students are capable of doing a good job in research. As there are about 2,500 undergraduate students living on campus, they form a big pool of untapped energy reserves. As the vision of scientists specializing in a particular field gets narrow over the years, the fresh ideas that undergraduate students carry around is definitely a boost.

But, my experience of such cases has had both its positives as well as negatives. In a very few number of cases, the students have been sincere and hard-working. In a majority of cases, the students come in with a lot of energy which starts to wane quite early. In some cases the students vanish without even informing the professor concerned. I don't know what has been the weakness on both the sides. Maybe they have many assignments to complete, but I feel the undergraduate students are a bit complacent as they do not get involved in such projects seriously as compared to students from other colleges who are ever-ready to simply grab such opportunities.

However, on the whole, the scope for research at the undergraduate level is very good with the bottom-line that the student must be prepared, hard-working and sincere in handing such projects.

Strengths: Finally, sir, what is your message to the readers ?

Dr. Lohani: *Work hard and enjoy life. Put the efforts on the thing which is of your real interest.*

2. Kosi floods: A Human Disaster

- Dr. Rajiv Sinha, Ravi Bohra, Puneet Chugh

The Year 2008 witnessed one of the greatest river disasters in recent Indian history when the Kosi river draining the parts of north Bihar shifted by over 120 kilometers eastward triggered by the breach of the eastern afflux bund at Kusaha in Nepal. This breach on 18 August 2008 was the eighth incident of its kind since the construction of the Kosi barrage and the first upstream of the barrage. Thousands of lives have been lost; a multiple of that number have been rendered homeless; homesteads, lands, livestock, and livelihoods have been destroyed. The *Kharif* crop has gone, and when the water recedes and if there is heavy sand-casting, the *Rabi* crop may also prove impossible.

The Indo-Gangetic Plains, drained by some of the largest river systems in the world are regarded as one of the world's worst flood affected region as almost every year monsoon flood bring misery to the inhabitants living on the floodplain. The available data suggest that during the last five decades, more than 2700 billion rupees were spent on flood control measures in India, but the annual flood damage increased nearly 40 times and annual flood affected area increased 1.5 times in this period. The Kosi river in north Bihar plains, eastern India is a major tributary to the Ganga river system and has long been considered as a dynamic river due to frequent changes in its course and extensive flooding.

Dr. Rajiv Sinha at the Department of Civil Engineering, IIT Kanpur has been working on the floods of north Bihar rivers for over two decades and also visited the site of the Kusaha breach in Nepal as well as the flooded areas in north Bihar in November, 2008. He has recently published a research paper on the flood risk evaluation of the Kosi River based on a GIS based approach using one of the multi criteria decision making techniques, Analytical Hierarchical Process. The basic aim of this research was to create easily read and rapidly accessible flood risk maps based on morphologic, topographic and demographic data.

A combination of different data sets such as remote sensing images, census data (1991), and topographic maps were used to derive a composite index of flood risk. Finally, all data was integrated in a GIS environment to prepare a flood risk map which not only defined the susceptibility of each area to inundation but also provided means for assessment of flood risk in terms of loss of life and property.

Repetitive satellite images show that the river has been moving towards the eastern embankment around Kusaha region at least since 1979 and a breach in the embankment at Kusaha was detected as early as 5th August, 2008. Dr. Sinha argues that although the August 2008 event in the Kosi has been widely perceived as a flood event in the media and scientific circles, this in fact marked a mega-avulsion of the Kosi river. It is true that a large area was inundated after this event but it is important to appreciate that this inundation was different from a regular flooding event.

Most analysts agree that the confinement of the Kosi within the embankment further worsened the situation and has caused significant aggradation within the channel belt. Further, the embankments along the Kosi have not only outlived but are also poorly maintained. This must have facilitated the breach at Kusaha, and the consequent avulsion and inundation. Therefore, unlike the previous movements and flooding history, this disaster seems to have a strong 'human' component in terms of our intervention and ill-planned, outdated river management strategies. If there is any lesson to be learnt from the Kosi disaster, we need to move towards a strategy which emphasizes on "river management" rather than "river control".

It is important that a 'system' approach to river management is adopted keeping in view the dynamic equilibrium of rivers. A process-based understanding of river systems and the coupling between river form and processes are needed to find long-term solutions to river dynamics and floods.

3. Green Toilets

- Dr. Vinod Tare

Conventional techniques for disposing human waste are built on the premise that the nutrients contained in human excreta have little value, and that waste is suitable only for disposal. Such techniques assume that the environment is capable of assimilating the waste, or they shift the burden to downstream communities. These assumptions lead to linear flows of resources and wastes. Consequently, the environment is polluted, nutrients are lost, and a wide array of health problems results.

The other solution of conventional practices, generally pit latrines, has been widely adopted in developing countries, primarily because it is inexpensive and requires no infrastructure. Though material is not removed from the confined pits, they are prone to periodic flooding, causing them to spill their contents. Liquids may leach into the ground and eventually be carried off-site contaminating nearby wells and underground aquifers. This option also has shortcomings especially in densely populated areas where space is limited and is not feasible in areas with hard ground or high water tables.

An alternative to the present practice could be based on the wisdom of isolating the water bodies from human and animal excreta. The alternative practices based on minimum or no use of water for conveyance of waste to avoid entry of fecal matter into the water bodies are referred as dry sanitation or ecological sanitation (EcoSan). Ecological sanitation symbolizes a vision of sustainable sanitation systems based on a systematic material-flow-oriented recycling process of nutrients and water as a hygienically safe, circular and holistic alternative to conventional solutions. It recognizes the rational utilization of non-hazardous treated human excreta as a useful resource, so as to achieve the purpose of health protection of human beings and ecological balance.

The technology developed by IIT Kanpur adopts EcoSan philosophy and is aimed at principle of zero discharge. The toilets are identical to those in conventional water borne system. The solid and liquid matters are separated underneath the toilet seat itself by using a solid liquid separator. The separator allows formation of a thin water film that adheres to the surface of the separator and flows outwardly while most of the solids gravitate into the central retention compartment of the Retention cum Polishing (RCP) tank. The solids gradually disintegrate to form slurry, which is then evacuated from the tank under gravity. The liquid is passed through a micro filter and recycled for flushing the toilet; thus avoiding the excessive use of fresh water for flushing while no compromise is made on using the liquid for completely flushing the toilet pan. Specially developed microbial cultures are used to eliminate any foul odor.

The fecal slurry is converted into quality organic manure using activated aerobic composting and Vermicomposting for rapid and effective utilization of valuable organics and nutrients. The excess flush-water is evaporated using solar energy to obtain valuable nutrients present in human urine. The advantages of the proposed technology vis-à-vis traditional technology are:

- Saving of fresh water. The water requirement is approximately $1/10^{\text{th}}$ of the present requirement.
- Valuable by products in the form of organic manure and inorganic fertilizer in the powder or concentrated liquid form.
- Easy installation in congested localities with no sewerage system.
- No requirement of electrical power supply or motor driven devices.
- User comfort and hygienic conditions maintained at the same level as in conventional water borne systems.

Operated and maintained by the community generation of employment to local people. This technology has been successfully used on the IIT Kanpur campus and in Aligarh for a community. The system based on this technology is now ready for trials on Indian Railway Passenger Coaches and House Boats in Dal Lake at Srinagar. If exploited properly, it has the potential of revolutionizing the practices of sanitation, water pollution and water resource management.

Giving Back ...

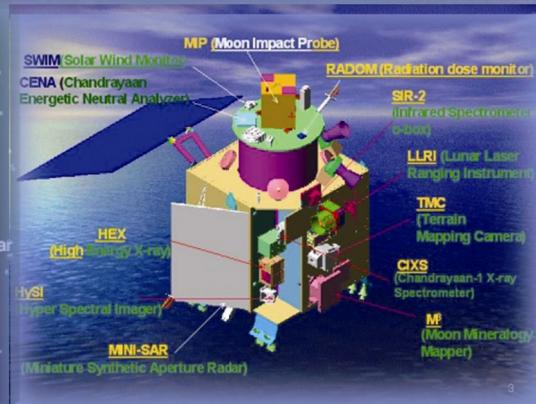
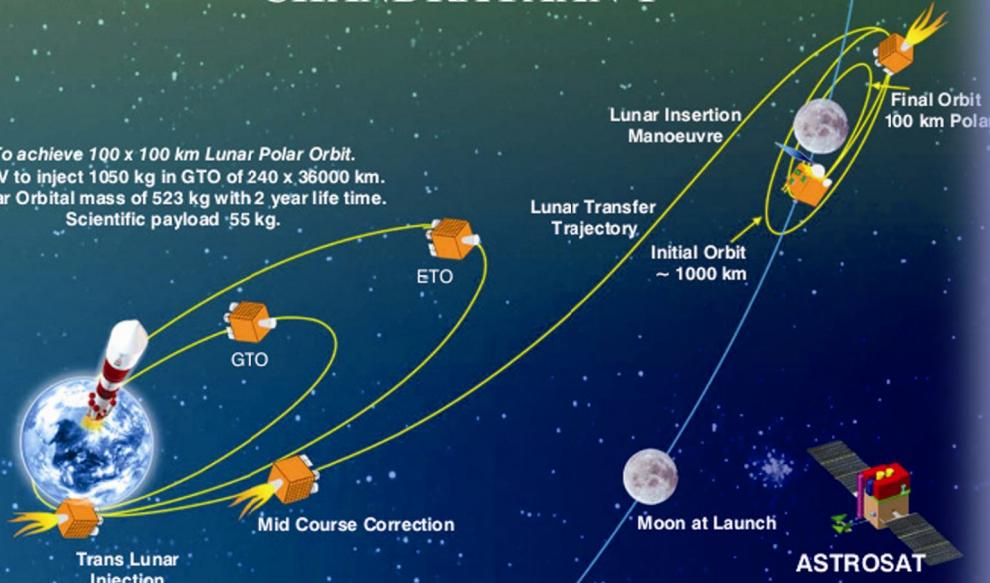
what we give to the society.



SPACE SCIENCE

CHANDRAYAAN-1

To achieve 100 x 100 km Lunar Polar Orbit.
PSLV to inject 1050 kg in GTO of 240 x 36000 km.
Lunar Orbital mass of 523 kg with 2 year life time.
Scientific payload - 55 kg.



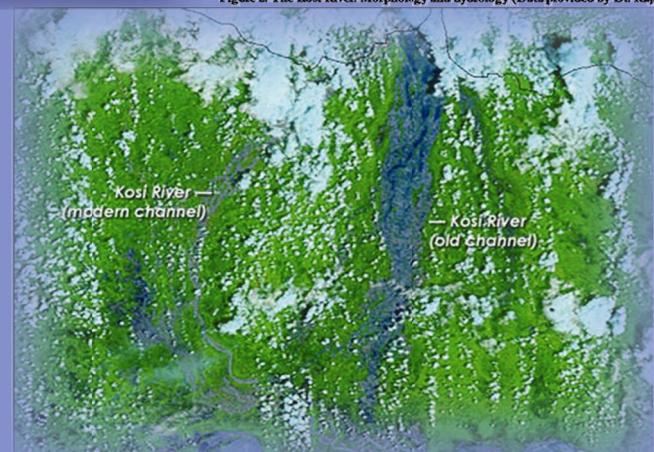
Expanding the scientific knowledge about the moon, upgrading India's technological capability and providing challenging opportunities for planetary research for the younger generation

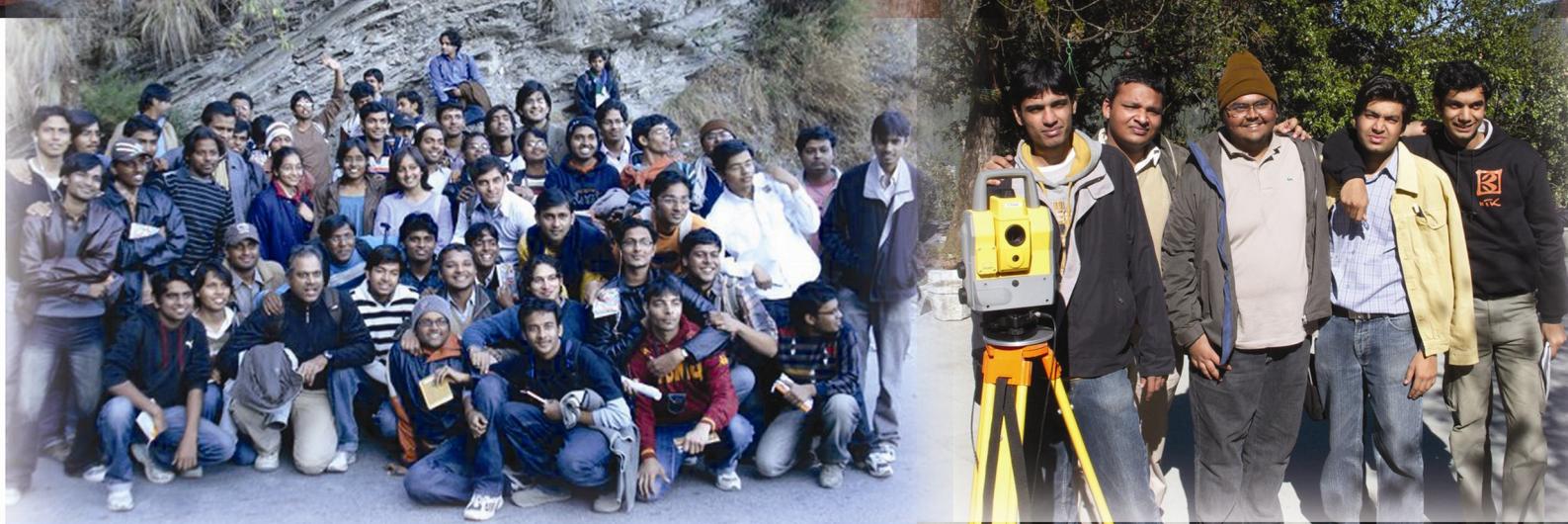


	Kosi	Ganga	Amazon
Catchment area (10^3 km^2)	101	1073	7180
Total length (km)	1216	2700	6518
Average Annual discharge (m^3/s)	2036	15,000	480,000
Annual sediment load (mt/yr)	43	1670	1000
Discharge/Area	20	14	25
Sediment yield ($\text{mt}/\text{y km}^2$)	0.43	1.56	0.14

Note: u/p indicates upland to plains area ratio

Figure 2. The Kosi River: Morphology and hydrology (Data provided by Dr. Rajiv Sinha)





Guru Ki Kalam Se



Friends, this time we are going to have a new and regular section in our 'Strengths' named 'Guru Ki Kalam Se'. In this section we'll have views, opinions, experiences and motivations shared by those who have been an inseparable part of our daily routine and have already played a fantastic innings that we have yet to start, our GURUS in real sense. They are always busy in shaping our futures and igniting our minds with their knowledge. This time we have Professor C. V. R. Murty, our Ex-GURU with a few but very significant droplets of his ink on the paper.

IIT students today need to work harder than those who graduated decades ago from the IIT system. This is because there are many more options for them after they graduate. These days students are more vocal and are "using" freedom to decide themselves what they want. This is fine, but at the same time, they need to do proper homework before choosing the "future" that they are seeking. Many of our recent graduates reached the next step (job, MBA, ...) and realized that they did not want that. This happened due to a complete lack of even basic information regarding that option (job, MBA, ...) before seeking out for the same. Only monetary aspects are deciding the fate of all choices to be made by the next generation, thanks to a number of ill-founded reasons, including some undesirable pressures from parents.

The IIT students need to know that IIT graduates will always be the top cream of the world even in terms of monetary status. Money is essential, but satisfaction is more essential than that. Medical expenses for the aged are increasing, and old age homes are expensive (younger people are lately not seen to be taking care of their old parents, and hence you have to plan your retirement.). Students need both of these for themselves in their old age. Hence, much against the perceptions of today's youth, money is more essential at old age, than at young age. So, students should think of the needs at the end of their careers than those at its start.

But, a more substantive need than all the above is that IIT students need to grow up to be HUMAN - grow up into graduates with a social consciousness. This does not mean that while at the Institute you will hold meetings and talk about the problems the society faces. Remember you can help, only if you are strong yourself. So, first you need to become good students - be empathetic, kind, giving and loving, in addition to being good at studies. The question then is how do you develop this side of yourself. Yes... this is not taught in any HU101 course. Keep your eyes open, you will see the humanity conduct itself in front of you. You don't have to solve the problems of the world while you are the Institute. But, as you graduate and take up a career, please apply the knowledge imparted to you through the degree programs for the good of humanity. Ensure two things on each day of your life: (a) that you have learnt something everyday, and (b) that you have been helpful to someone everyday.



Technology Development for a Cleaner Environment



(Based on an interview with Prof. Mukesh Sharma)

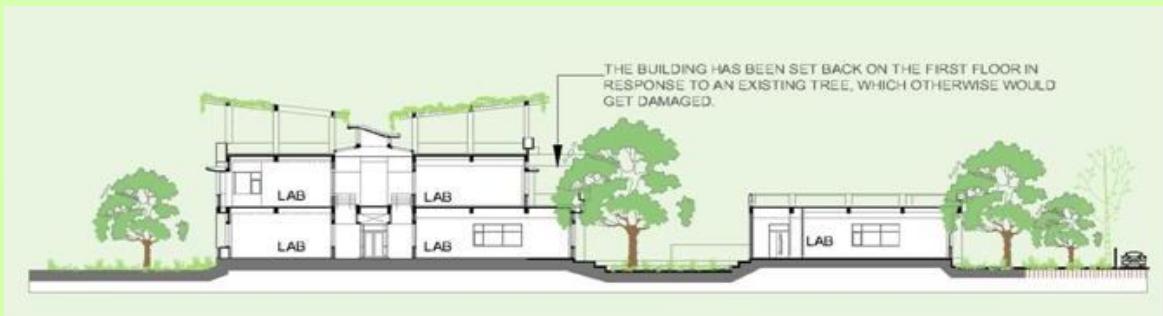
Keeping up with the trend of exploring into the various frontiers of natural sciences, the Department of Civil Engineering at IIT Kanpur right from its inception has focused on education and research in the field of Environmental Engineering. This discipline has grown several folds as environmental issues are becoming more interdisciplinary and complex. As a leader in this field, the institute has now come up with a new State of the Art facility, Centre for Environmental Science and Engineering, to encourage technology development for pollution control and for sensing environmental changes. In this article, Prof. Mukesh Sharma, takes us on a journey of this new facility explaining its need and salient features.

The Center for Environmental Science and Engineering at IIT Kanpur

Environmental issues/problems have become increasingly interdisciplinary and complex, and hence the solutions to these problems will require a combined effort from scientists and engineers from different disciplines. To this effect, a unique and broad-based interdisciplinary Masters Programme in Environmental Engineering and Management is offered at the Department of Civil Engineering at IIT Kanpur. The vision of this programme is to meet the growing human resource requirements of high quality to provide leadership in various new sectors including conventional environmental engineering. These sectors include: policy and planning, implementation and legal aspects, sustainable industrial development, environment-friendly infrastructure management, resource cleanup through remediation of land, water and air resources.

The main areas of current research in environmental engineering are water and air quality monitoring and modeling, pollution control technologies, aerosol science, and exposure and health risk assessment. Facilities for research in the Environmental Engineering are of highest quality with the state-of-the-art laboratory. The sophisticated instrumentation facility that the department has acquired can measure any organic or inorganic compounds present in air, water, sediment, sludge or even in body fluids at very low levels at parts per trillion (ppt) concentration. This helps in precisely measuring the amount of such harmful substances present in any material and develop technologies of international standard. The research in this area is supported by funds received from the UN, the World Bank, the DRDO, the Ministry of Environmental, Central Pollution Control Board and many other organizations and countries like France, UK, US, Sweden and Japan. The faculty members in this field have published several quality papers including top journals like, Nature and Science.

In addition to the vibrant and active program in Environmental Engineering at the Civil Engineering Department, there has been a growing recognition within the institute and amongst the environmentalists in the country that environmental engineering education and research must address more complex problems posed by nature and human-induced changes (both at local and global scales) in the Earth's environment. In this context, it was decided that IIT Kanpur must respond to current concerns of environmental education and research and take lead to meet the growing human resource requirements of high quality to provide leadership in various new sectors. It is further necessitated that the research should also focus on new emerging areas, which can respond to the varying societal environmental concerns and provide services to industry and regulatory agencies in the country. This urgent need to push environmental engineering research, the institute decided to create a world class research facility in the form of Centre for

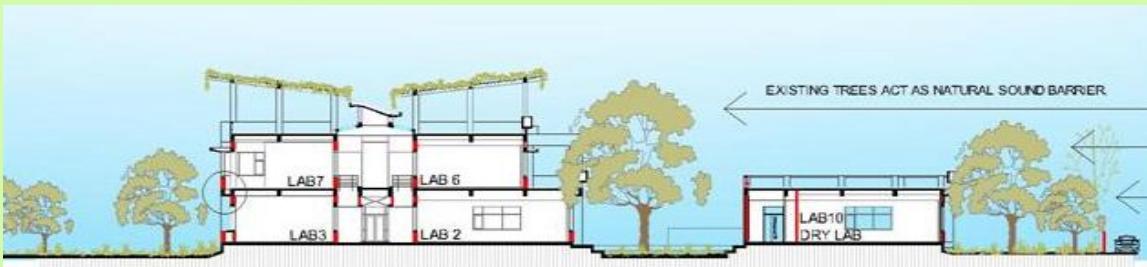


Environmental Science and Engineering (CESE) which has been conceptualized, designed and constructed as an environmental friendly “building in the garden.” The architectural design approach is holistic, with an aim to create a facility that is not merely functional, but also innovative in its response to issues of sustainability and energy efficiency. The spatial configuration juxtaposed within the natural setting results in visual transparency and facilitates a free flow of earth, air and water in the built environment.

This facility has been awarded a 5-star TERI-GRIHA (“The Energy and Resources Institute” - Green Rating for Integrated Habitat Assessment) building certification and is the only such structure so far in India. This facility has been realized by the combined efforts of several faculty members across many departments. The centre has been generously funded by the MPLAD funds pledged by Dr. Arun Shourie, MP, Rajya Sabha.

The special structure of the building and its other facilities are:

- Existing landscape are largely preserved and protected. The caterpillar shaped building has been taken through the inter tree space rather than cutting the trees for the required space.
- Architectural design is optimized as per climate and sun-path analysis, achieving reduction in energy consumption.
- Rain water from the building and surrounding area is collected and routed through a sedimentation tank to water body for AC cooling. Overflow is led to a groundwater recharge pit.
- Using efficient lighting controls & fixtures, optimization of the HVAC system, integrating earth air tunnel with HVAC, using efficient equipment and controls.



It is expected that application of these technologies will increase significantly and this initiative will help the country in taking a lead in this field. Also such pioneering projects have started attracting many students to specialize in this area and become leaders in their respective professions.

The new mantra focuses on the 4-'R's i.e., Recycle, Reuse, Recover and Reduce. The future plans of the department, which has already been coordinating with various institutions, is on making the young generation more equipped for practical adversities and real time problems like cleaning up of the Ganges and many others. So, in this way the department is constantly monitoring the academic courses for imparting cutting edge technology

- **Karthik, Ravi and Pranjal**

Survey - Geology Camp – *Haseen Yaaden*



Keeping up with the old tradition of the department, this year our young and in-the-making 3rd year civil engineers took a plunge into the sea of practical aspects of basic survey techniques in the gorgeous valleys of Nainital district which is situated in the Kumaun foothills of the outer Himalayas. The camp constituted of two major portions viz. Survey camp led by Dr. Bharat Lohani and the Geology camp led by Dr. Javed N. Malik.

The party reached Nainital via Lucknow and Lal Kuan, to stay in a beautiful place which was called the Aurobindo Ashram, which was basically 3 km away from the town mainland. Surrounded by the Oak forest and lots of beautiful peaks, the Ashram provides food and shelter for student camps and is a centre for fun activities during the summers and winters.



Nalinji, the caretaker of the Ashram, shared lots of experiences with the students, somewhat entertaining them occasionally. The management of the Ashram was led by Jayanto Da, who told that the Ashram was built by Scottish people, to stay and embark on their mountaineering adventures. And after them, the locals took charge of the place and bought more land nearby and turned it into the place which we have today.

During the thirteen day stay at Nainital, the students were supposed to acquaint themselves with the techniques and functioning of Total Station and GPS, as a part of the survey camp and with the local rock type and the topography, as a part of the geology camp. Also there were lectures about the advanced surveying techniques like LiDAR. As far as students were concerned, it was an experience of a lifetime which included fun, masti, nerd stuff and then the special ‘Bonfire’.



The day the students landed there, there was a trip arranged to a peak called the ‘Dorothy Seat’ which left many of the students very exhausted as most of them were in the habit of sticking themselves to the bed and watching movies. The next day onwards the real stuff began. The students were supposed to prepare a map of the Ashram using the total station, also they had to prepare a road profiling map of the road near the ashram and to traverse and prepare two different routes through the heart of the city, using the GPS.

It took a lot of courage to handle such sophisticated instruments but the tension and pressure was released by the very knowledgeable and experienced staff of the GI lab including Shitlaji, Mauryaji and Susham sir. All of them worked very hard along with the students to make the camp a big success. After the 7 days of furious work, the students were joined by Prof. Dr. Javed Malik. He took them to various places showing them instances of landslides, steppes, MCT, HFT and various other folds & faults thereby exposing them to the real world of Geosciences.



Following Albert Einstein, who once said, ‘Try not to become a man of success but rather try to become a man of value’, the students and faculty members had to wash their own utensils and each day one group was supposed to serve the food to the whole batch. This added a flavor of humanity and community service in the batch and everyone tried to serve the others in the best possible way.

Apart from the academic part, the camp included a whole lot of fun including two bonfires. The spine-tingling chill was eased by the warmth of the fire and singing enjoying students. One of the groups proposed to traverse the highest point in Nainital i.e. The Cheena Peak. The proposal was accepted and they went to Cheena Peak instead of traversing the township. It was a grueling experience full of stoned roads, high rising trees, thick forests and steep slopes, but the incentive was worthy of it, a view of the entire Nainital from the Cheena Peak. Awesome!



Not only this, the students enjoyed themselves by going to various places nearby like the Dorothy peak, Land's end, Tibetan market, snow view, boating in the Naini lake and sometimes just sitting to themselves in the night seeing the sky and admiring the beauty of God's creation.

The camp came to an end and all were happy to return back to their homes. The professors felt happy on the smooth run of the camp and for the fact that no one was hurt. In totality the camp was a wonderful experience and such camps should be held two times in the whole curriculum if possible. The best part of the camp is that it helps to unite the whole batch which is a very important virtue.

For future references and for outsiders the .kmz files of the work sites have been made and along with the pictures they have been uploaded on the camp website.
<http://home.iitk.ac.in/~abhinavg/surveycamp>)



Camp Bloopers!!!

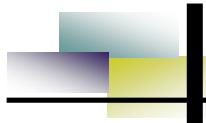
- *The word ‘Abe’ was used about a thousand times on the first day itself.*
- *Ranikhet turned out to be the Dark Continent.*
- *The daily hoaxes of leopards roaming in the ashram premises previous nights.*
- *Staying without bathing for 13 days at a stretch.*
- *“Agar BUS Gir Jati..To Ek sad article aur add Karna Padta (Sabke Pics Aur MAALAON k Saath..[:P])”*



STIMULUS

THE DEPARTMENT DAY





StimuluS'08 —The Department Day

Life is a journey, more you interact with the people, the better it is. Students @ IITK are provided various opportunities to interact and compete with other students as well as people from outside. Well, if you get a chance to participate and compete with your teachers, are you going to miss it, obviously not? But many people will ask "Does anyone get opportunities like this?" The answer is YES, StimuluS'08, the first Department Day of Department of Civil Engineering. It was an impressive attempt to increase the Student-Faculty as well as the Student-Student interaction. In fact, the day February 23, 2008 was the first department day of any department ever celebrated in the history of IIT Kanpur.

StimuluS'08, as the name suggests, was an event which aroused the action and the inner fire among all the people. Though it was the Department Day for Civil Engineering but students from almost all the departments actively participated in its events. Whole day was divided into subparts as below:

- Clay Modeling
- Sketching
- Interaction Session with Seniors
- General Quiz with Sudoku and Crosswords
- Dinner
- Inspirational Movie

The events started around 2 PM with Clay modeling and Sketching. Faculty members encouraged students to participate and they themselves along with their families eagerly participated in clay modeling and sketching. The enthusiasm towards the event can be judged from the fact that Head of Department Dr. C.V.R Murty (now director of IIT Hyderabad) himself came to participate in sketching and was present throughout the day participating actively in the events. He was center of encouragement for all the students. As the day proceeded, the event headed towards Interaction session which included an informative talk by fourth year students on career prospects of civil engineering, placements, internships and some other interesting topics too.

It was already 4 'o' clock evening and everyone was keen to have some snacks. Just after the snacks the face of the event turned towards quiz. The pattern of the quiz was again having involvement of both, the students and the faculty members. Teams from both students and faculty members participated. In the final round, a wild card entry was given to one of the teams from the faculty members, which really turned the show into a good competition. Although it was a tough competition but as usual there is only one winner. The team of students won. Sudoku and Crosswords continued along with the quiz for the audience. Right after the quiz followed the prize distribution ceremony, distributing prizes to the people who really proved that they had something different inside. Also on the occasion Strengths'08 was released, in addition to that for the first time Civil Department T-Shirt, for which the people have been waiting for all these years, was released.

After all this fun and frolic, it was the time for dinner. The dinner was followed by an inspirational movie—"The Freedom Writers". The response of everyone towards the event was overwhelming which can be signified with the fact the Quiz itself attracted more than 250 people!! The competitions were not meant to decide who is the winner or loser but to encourage everyone to come together and spend a day with the people around them.

Events like this are very much needed in today's scenario where young students do not understand how important really it is to interact not only with their fellow students but also with the faculty members. It brings out the feeling that after all, all of us are the members of one united family called Civil Engineers. Such events must be encouraged and organized in all the departments for a healthy and interactive environment in the academia.

- **Salil Goel**
B.Tech-3rd Year

A Walk Down the Memory Lane



Raushan Kumar Singh, Rajil Jain and Abhinav Garg are from the Y4 batch and would be among the first dual degree students to graduate in Civil Engineering from IIT Kanpur. Raushan is doing his thesis in Structural Engineering under the supervision of Dr. S.K. Jain while Rajil is in Environmental Engineering under Dr. P.Bose and Abhinav is in Geoinformatics under Dr. Onkar Dixit. The next few paragraphs are an attempt to sum up the lovely time they have spent at campus (we know we would fail) and some valuable advice to the juniors.

Raushan was a little confused about why he had opted for a dual degree initially, but now after having finished 4.5 years he realizes the importance and value of what he had chosen, and strongly believes that it has given him greater insight about what to do. Abhinav on the other hand, was pretty confident about his decision to opt for the dual degree program, though he also felt that the picture wasn't very clear until the third year. He appreciates the academic system and at the same time the cultural activities which were really absorbing. Rajil has an interesting viewpoint; he believes that IITs don't prepare one for a particular field but helps in developing a general and versatile aptitude, which would come very handy in any working environment. He firmly believes that success is not just moving up but also moving laterally.

Rajil feels that the department has become more student friendly and the interaction between students and faculty has improved. The concept of Class Committee, he feels was a novel idea and gives the perfect forum for one to put forward their views from appreciation to constructive criticism. Abhinav also second Rajil's view. However Abhinav feels that Cancellation of internship though rational was a welcome move, but he strongly feels that the B Tech projects should not be done away with (as there has recently been some speculation about it) since they give weaker students a chance to improve their overall performance. Raushan feels that the quality of academic system has declined sharply as many of the brilliant and highly experienced professors have left the institute. He also notes that there has been a decline in the SOCE activities, but there has been a rise lately.

Raushan recalls that the topic of discussion in most of the CE 251 classes used to be the absence of Rajil from the classes. Also, once Dr. Amit Prashant overheard Rajil yelling out his frustration after a surprise quiz and said, "Yaar, bataya toh tha!" He also recollects the incident when they were on a departmental trip to Goa and Bombay and were suppose to find some structure related to Civil Engineering, and they discovered a marvel – a revolving bridge! One of its only kinds in India. Rajil recalls the winter camp, where they actually came to know their fellow civilians. He also recalls how they used to have virtual gymkhana elections (the actual results varied though!), he certainly cannot forget the experience of travelling to Spain and Italy without a Visa, he however, advises all of us not to get so adventurous (We wonder why, why should you have all the fun :)). Abhinav cannot forget when most of their batch mates were caught on account of having copied their assignments by D. C. Rai Sir, and were asked to confess! They did so in pairs (although the group was much larger!) which however resulted in a reduction of marks.

Raushan believes that the courses should be more industry oriented than plain theoretical. Abhinav also feels the same and also wishes that the gap between what we was taught and what a company expects could be bridged by simply including the project for the degree program into the grading system. Rajil feels there should be some kind of reservation to increase the number of girls in the department (we all are also for it ;))

As an advice to the students still deciding whether to change to a dual degree program, Rajil says that in Crunch situations (like the ongoing recession) companies prefer dual degree candidates over the B.Tech candidates, besides dual degree students get more time to reflect and far greater time to pursue their interests since they become aware of the same only by the end of third year. All this plus a year saved over the conventional 2 years M.Tech program, making the dual degree an unmatchable option.

However, Raushan is quick to add that if one is inclined towards doing an MBA or IAS (s) he should not take up a dual degree since that would be a waste of the specialization. Abhinav feels, a dual degree is best when one is not sure about the future, that extra one year gives one the extra little time to think about it. He also feels that MBA, IAS, etc are pretty tough for an IITian to crack, because of the time constraints and the course load.

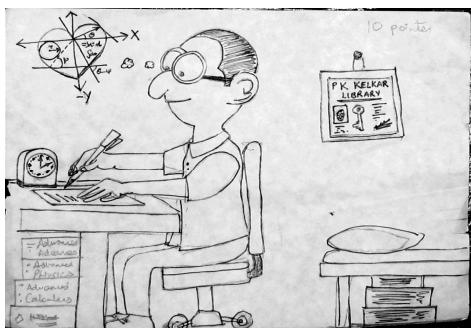
Like every other IITian, all three have big dreams for their future, Raushan says he would decide his future course on the basis of his experience in the first year of his job and then choose between another year or PhD and then about his future ventures. Abhinav would want to work in such a way that after say 4 - 5years of service, his work and decisions are respected and liked. Rajil would want to work for a year or two after which he might think of switching over to another job depending on his satisfaction level or go for an MBA from Stanford. Plan B would be a PhD and plan C would be IAS. Expecting a difference in capabilities and abilities of his co-workers he hopes for the best and prepares for the worst!!

Rajil wishes that the “junta”, no matter what it does, it should do it with the utmost interest and dedication. Also, the sooner the junta realizes their interests the better it is. Abhinav feels that everything here is well and good. He wishes to see new events in Techkriti and both students and faculty working together for a better interaction. Raushan says IITK has taught all of them a lot...It has shown and prepared them for the competitive side of life. He would advise the junta to keep their goals in mind and give their best in striving to achieve them. He would also love to see greater participation in SOCE activities and appreciate the quality of events conducted by it.

All the three of them wish to thank the professors, seniors and juniors for their love & respect and IITK as a whole for whatever it has given and taught them. IITK rocks !!!!

We on behalf of the Strengths Team want to thank them for sharing their experiences with us, and wish them all the very best in their lives and future endeavors.

- Smit Chandra , B.Tech - 2nd Year
Mahak , B.Tech - 2nd Year



Two Stages of IITK Campus Life





A Lab Report

Stability. That's precise," remarked Saurabh, as I looked on blankly. Really, the entire experiment thing had been so boring for me, as for me it was just, I would not say unimportant, but precisely uninteresting. All the sciences seemed to be vague, all the studies just summed up to zero, and I was an open question to myself: "What was I doing on a planet which is so uninteresting?" Somewhere, before my days of technical education, in the early, clean shaved, soft skinned days, I had written an essay titled, "My ambition in life". And that was it, that was when everything had started to haunt me; not in the manner of the marks I got, or the manner in which it was so stereotypically unmatched: I was not a doctor, I never wanted to become an engineer, I was no lawyer, nay, I was not, in short, someone conventional. What I wanted to be was a person of my own dreams, who could speak his heart out to the audience. I was confused to be a story-teller by the people who said they loved me, but more often than not I saw in their eyes the image of a self obsessed child who was obstinate enough not to follow, what others called, *A LIFE*.

"Shashank, that's stable, see?"

Ah, and he did shake me out of my uncomfortable state, to take me to another, more uncomfortable one.

"Yeah," I sighed, "That is precise. Can we go now?"

"Dude, we have to finish the lab report before we go, this is an assignment."

"Not our first," I said, taking out the calculator and notebook from my bag.

"Have you always been like this, or is it something you have become after coming to IIT?"

"Perhaps," I said, as I noticed Saurabh not even waiting for my answer and going, most probably to arrange the copy of the report prepared by the toppers of the batch, the people who 'stereotypically' did everything right. Or perhaps, my conscience cried, it was the case of the grapes being sour to me; the only fact being, what to do if I didn't like grapes at all – be it sour, sweet or salt? I love apples, and you are giving me grapes? Ah, I wanted to be something akin to a lobbyist, not the legislative one (my interests are choosy), but a more convenient (and convenient also!) business oriented one. And that was one thing which never got encouraged; at least I needed two excellent degrees from two excellent institutes, and a few excellent ransoming salaries to pursue my own un-excellent interests. So, I came to the IIT, thinking that it might help. But it bored!

"Here," said Saurabh, in breaths slightly heavy, as if escaping the eyes of the professor in charge had tired him, "copy them down. I am rearranging the apparatus. Just finish the thing quickly!"

"Saurabh, what if..."

"Listen Shashank, we decided this beforehand. This was the toughest assignment, and I did the entire experiment. You make the reports."

"What if, we don't make the reports?"

"Well, what else? You wish to make a fish out of me like you have made out of yourself at this place? What do you think, surviving is an easy thing over here? Or, is life poetry for you? I find no music here to rhyme with it, dude."

"What's the use of making copied reports?"

"Then make one yourself, next time, when you are handed an assignment on your own and not in a team with me. And for that, you better resurrect your dead grades; do one thing, try writing stories and shit stuff on something like 'the advantages in engineering' and the 'ethics in engineering' or 'success in engineering', and you will discover that the second thing, Mr. Ethics, becomes a big pebble in the way of Mr. Success."

"And we find success in getting marks, Saurabh?"

"I do, and I am quite sure you would also. Did you go boozing yester night or what? Just do the work, dammit!"

"Yeah, sorts of. This place lacks creativity."

"And you are the only one who owns it," exclaimed a disgusted Saurabh, as he snatched the reports from me, and started copying. And right then, right there, my '*problem*' started. The same *problem* which had carried me to IIT despite my wishes being against it. The same problem which made me study for the entrance exam of the IIT's. It is, well, quite unmanly for sure, but emotional. I could not bear people hurt because of me. And my definition of 'hurting someone' is too broad. My 'ambition in life' hurt my parents, my relatives, and now it was hurting my friends at IIT.

"Give it to me, Saurabh, I will do it."

In my neat and clean handwriting, and without a word more, the report was done. It got 9.5 out of 10. It was brilliant enough to get an A indeed.

- **Shashank Kumar**
B. Tech-3rd year

The Kingdom of Twilight



Twilight brings the sorrow
When man is set alight
Thoughts he does borrow
Full of his fears and fright
Of agony and anticipation
In the race called his life
Hopelessly lacking action
All but a hackneyed strife:
A conflict what to do and not
A compromise always to reach
Freedom as a child he sought
But life's there with a breach:
A demise of all his dreams
A collapse of his owned desires
Morbidity shadows and seems
In those soft emotional pyres
Scornful are the best of times
There's no harmony or charm
Nothing with which life so rhymes

Nothing, nothing but material
A world of stranded hollowness
Nothing, nothing heavenly real
In this dystopian heaviness
What's existence in a coma?
What's struggle on a deathbed?
What's imaginative in a trauma?
What's exaggerative in what's said?
Smile, laugh, frolic in sarcasm
And you'd go not thinking about
This is truth as night turns dark
Twilight will come again and sprout
Such questions you'll hauntingly hark
And as if with spark, they'll all fade
Like your emotions or things equally raw
You'd move on in a harrowing shade
Ignoring what you just heard and saw
And this way you'd just end one day
In a silent collapse of everything
My poem ain't lovely or needs a say
But in your last breath, this song you'll sing:
That twilight had brought the sorrow
When you, the man, was set alight
Thoughts you, the man, had then borrowed
Full of your manly fears and fright:

'In this kingdom of twilight'

- **Shashank Kumar**
B. Tech-3rd year

A tête-à-tête with the SPO Chairman



Dr Bharat Lohani has been the Chairman of the Students Placement Office for two consecutive terms. He has brought some significant changes in the process giving a boost to the overall placement scenario at IITK. With the global meltdown & recession having its effect felt round the world, the Strengths team catches up with him to discuss how the SPO is getting ready to tackle this situation & also clearing some doubts which students have regarding placement with special reference to the opportunities in Civil Engineering.

Strengths: Sir, This is your second consecutive term as the chairman of the Students' Placement Office. How have your experiences been by now ?

Dr. Lohani: The experience so far has been great, I would like to divide this experience as interaction with the three different sections as below:-

1) Students: We have a large team of students with Overall Placement Coordinators, Automation Coordinators and Department Placement Coordinators, they are from both UG and PG levels and play a key role in the functioning of the SPO, their zeal provides me a lot of energy.

2) Companies: This has also been quite good and I have now formed good bonds with many companies.

3) Institute: It plays a very important role in the overall supervision of the SPO work and has been very supporting.

Strengths: A general trend has been observed that students prefer a job as compared to pursuing higher studies. What are the main reasons behind this trend ?

Dr. Lohani: This trend can be attributed to the following reasons:-

1) It is due to our tough academics and also partly due to lack of motivation from the society which evaluates job more than research as jobs are more lucrative as compared to the research field.

2) In our country, we don't have facilities and labs for research and those which exist are in the government sector. In Indian industries we just acquire technology from abroad and master in its operation but this situation is fast changing and we expect more research opportunities in the private sector in the coming future.

Strengths: What was proportion of students getting placed in Core, IT, FMCG, and Finance sectors last year ?

Dr. Lohani: Last year we had an overall placement of 96.5 %. Sector wise it was about 61 % - Core, 11% - Finance, 7.5 % - IT, 3.8 % - FMCG. As we can conclude from this data the trend is tilting towards core sector which is a very good sign and the students have many options to decide where they should advance.

Strengths: How many companies are coming this year? How many core companies are coming for our department ? Why the number of core companies for CE is quite small as compared to the other departments ?

Dr. Lohani: Last year 131 companies visited the campus for placements but this time we have a target of 150. 115 companies have already registered and this number is going to increase. This seems tough keeping the global economic crisis in mind but we are trying our best and this time we are thinking to extend the placement session to the 1st week of March as compared to February each year. The number of core companies for Civil is 8-11 but it's increasing with the boom in civil engineering and shift from IT to the Core sector.

Strengths: What is the reason for the field jobs in civil engineering being not as lucrative as compared to the office executive jobs ?

Dr. Lohani: In civil core companies , the work is basically in the field and consists of supervising labor and looking after the overall turnout of the project ; now this can be done by anybody be it a IIT grad or a NIT one as no special skills is required which is why the initial packages are low. But if you have strong fundamentals then your rise in a core company is quite fast and in just 2-3 years you will be able to equal or cross what a person working in IT is paid. So if you as a Civil engineer are ready to dirty your hands, stand in the sun and bear the nuisance of the unskilled labor and public then you surely have a bright future ahead.

Strengths: What is basic difference in the job scenario for a B.Tech and M.Tech student in civil engineering ?

Dr. Lohani: Not much difference exists in the companies which recruit the B.Tech and M.Tech students, even the average packages are almost the same. It's just that the M.Tech students are employed in the more specialized fields the B.Tech. For the first Civil Dual this year, it is expected that they will jobs as compared to the B.Tech or advantage of having trained in IIT

"If you as a Civil engineer are ready to dirty your hands, stand in the sun and bear the nuisance of the unskilled labor and public then you surely have a bright future ahead."

of civil engineering as compared to degree batch which is passing out be offered better and higher paying the M.Tech students as they have the for the longest duration of 5 years.

Strengths: Abroad some of the students graduation start their own startup engineering but here in India startups in so ? Is it a failure of the students or

Dr. Lohani: As previously IT boom in plenty of numbers for new core they can come up with the only limitation not only requires years of experience which is not that freely avail-

dents just after graduation or post-consultancy companies in civil engineering are not encouraged why is it the education system or both ?

was there so opportunities were not companies in CE but now surely

civil engineering fields need new tools whose development needs civil engineering knowledge, so a

civil engineering company working on development of civil engineering softwares can surely come up as a great startup and can flourish with time.

Strengths: Do you think the location of Kanpur is really hampering our placements ? If yes, what facilities is the placement office providing to foreign companies to facilitate their selection process and convince of them of coming here ?

Dr. Lohani: Had IIT Kanpur been situated in Delhi we would have better scenario of placements. Its true that location and poor connectivity of Kanpur has affected our placement to some extent. But as our essential part of duty we provide companies all sorts of facilities like telephonic interview and video conferencing to help in their placement process. Even we contacted the Federation of Industries in Japan to form better ties with the companies there to facilitate placement here at IITK.

Strengths: There is a talk about a Noida placement center for IITK, what is its progress and when is it going to become operational ?

Dr. Lohani: I don't know about its present status but what I can tell is that it is a 5 acre outreach center which is meant for all kinds of purposes like conducting conferences, meetings, seminars and short term courses and not just as a center for placement. It is impossible to take the entire batch to Noida during the entire placement season. It is only if a company is unable to come to Kanpur and wants to take interviews at the Noida center, we can send the short listed candidates so that their interview could be conducted there.

Strengths: As the present economic crisis has led to the closure of many top banks and financial firms and some of them come to IITK for placement regularly. We think that this is the most challenging situation in the history of SPO. So, what kind of efforts you are making to tackle it ?

Dr. Lohani: This economic crisis is definitely going to take its toll on our placements as we are not in any way immune from what is happening in the international markets. The following impacts will be seen this year:-

- 1) Some of the regular companies for placement have refused to come.
- 2) They might offer lesser packages.
- 3) They may take in lesser number of people.

But as I said our placement is growing horizontally, we are trying to extend the opportunities available to the students with calling in more core companies and even inviting universities for hiring our students. Thus job opportunities in education sector are also being explored by SPO this year.

Strengths: Will the economic crisis affect the number of core companies coming for placement ?

Dr. Lohani: Only Finance and IT sector is the prey of the economic crisis while it has negligible effect on the core companies, even I think because of this more core companies maybe be coming this year as compared to the past years.

Strengths: What other difficulties have you faced in your tenure, what actions have you taken to counteract them and what changes have you brought out which have helped in the placements ?

Dr. Lohani: One of the major problems which I have faced is that I think the students here don't make smarter and better choices; they usually go for the companies offering big bucks without even thinking about their future job profile and prospects. To tackle this problem we have introduced a placement guide in which the Alumni share their personal experiences with their company and give an impartial overview of the company and its profile. Apart from this regular meetings are also called in the quad of hostels to clarify the doubts of the juniors about different companies from their seniors.

Companies usually report that IIT Kanpur students are fundamentally very good but are poor at software and communication skills so we are trying to improve the situation by conducting a number of workshops which will be quite helpful for the students. From next year we will be starting a new initiative in which the alumni will address the 3rd year students so that within time they get to know about the different com-

"IITians are meant for giving jobs not taking them."

panies and how to prepare for them.

Strengths: Any final words or

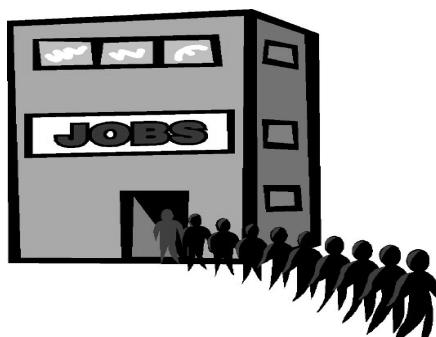
Dr. Lohani: I just feel we

here which are not being prop-

message for the students ?

have a whole ocean of resources

erly utilized, one of which is the



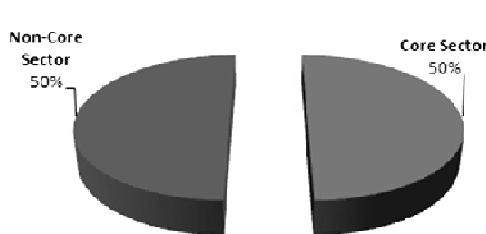
- Abhinav Gupta , B.Tech - 3rd year
Pranjal Prateek , B.Tech - 1st year

"PPO Apnayall hanjagari Gat Jayam ."

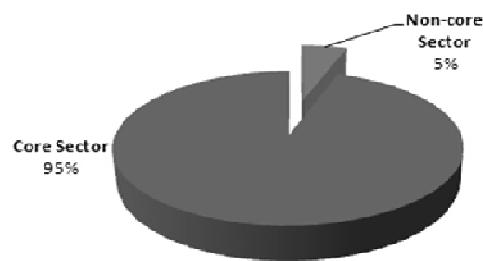
makrlipsa hanika sabaaAsana eva saniyat trilka . "

Placement Statistics

Sector-Wise Breakup for Undergraduate



Sector-Wise Breakup for Postgraduate



The following pie charts show the distribution of the students placed in the core sector and the non-core sector for the placement session of 2008-09. For the distribution of undergraduate students, the data is of the 18 UG students, who had got placed as on 7th February, 2009. For the distribution of the PG students, the data is of the 19 PG students, who had got placed as on 7th February, 2009. It is quite clear that the core sector dominates the PG student's choice with the non-core sectors like IT, Finance etc being reduced to a minority but for the UG students its a still a 50-50 situation.

Some of the Core and Non-Core but Technical Engineering companies in which the students were placed as on 7th February, 2009 are mentioned below :-

Core	Technical
Schlumberger Asia, Mumbai	Indian Oil Corporation Ltd.
DAR Group, Pune	Jindal Steel & Power Limited
TCE Consulting Engineers Ltd	MECON Limited
ERM India	Finmechanics

-Courtesy: Students Placement Office, IIT Kanpur

Note:-

1. All the statistics which have been presented only represent the placements which have taken through the Students' Placement Office, IIT Kanpur. It does not include those students who might have got off campus offers or might have gone to pursue higher studies.
2. Undergraduate includes the B.Tech students and Postgraduate includes the B.Tech-Dual, M.Tech and the M.Tech EEM students.
3. All the above data is subject to change with the placement session extending till May, 2009 this year.

Disaster “After” or “Before” Management



(A review of what happened in Bihar this year and what has not happened for many years.)

“More than three million people in over 1,000 villages were rendered homeless and over a million cattle affected by the floods.” Headlines like these have almost become too common for the common man. It is not that the mighty Kosi River has changed its path for the first time, it has been doing so from time immemorial.

Even after two months after the floods until October, at least 3,611 people were missing and to manage this situation *better* the State Disaster Management Department just opened a lost and found cell !! The same incident happened in Mumbai too. Even after the massive flooding on July 25th 2005, which claimed at least a thousand lives, the administration is still in its deep slumber. Well, I don’t know if the government has done its bit or not, but this incident made public coming together and making the difference. This time Bihar Flood showed that now people are not bothered about the government and its efforts as they have moved on from a dedicated critic to a dedicated citizen.

The time has come when we as civil engineers need to take a step forward. All the time the blame has been passed on to poor maintenance. However we know very well that we didn’t perform to our capacity. It is impossible to restrain river Kosi or Mumbai Rains, but have we done our part? Disaster management is good and is totally necessary since right now we are not well equipped to handle these natural disasters. Disaster management can be taught as a subject in the Secondary and Higher Secondary Schools. Disaster Management has already showed some results. One such example is of the Tsunamis. Though (luckily) no other tsunami has struck ever, the 2004 Indian Ocean Tsunami that claimed countless lives was followed up with brilliant efforts which ensured that whenever there is the slightest indication of one, the news will spread like fire and people can be evacuated immediately in an ordered fashion.

But, what about management before disaster? Not all the incidents are likely to happen due to the one and most common reason that they are beyond our control. There are many instances where structures have failed due to engineering miscalculations and negligence on the part of the engineer, etc. These are the things that fall in our domain; this “Hippocratic Oath” designed by the UK government’s chief scientific advisor Sir David King puts things in the right perspective. I believe it should be taken by every Civil Engineer.



"I shall: Act with skill and care in all scientific work. Maintain up to date skills and assist their development in others. Take steps to prevent corrupt practices and professional misconduct. Declare conflicts of interest. Be alert to the ways in which research derives from and affects the work of other people, and respect the rights and reputations of others. Ensure that your work is lawful and justified. Minimize and justify any adverse effect your work may have on people, animals and the natural environment. Seek to discuss the issues that science raises for society. Listen to the aspirations and concerns of others. Do not knowingly mislead, or allow others to be misled, about scientific matters. Present and review scientific evidence, theory or interpretation honestly and accurately."

- Vivek Agarwal
B. Tech-2nd year



"Are you polluting the world or cleaning up the mess? You are responsible for your inner space; nobody else is, just as you are responsible for the planet. As within, so without: If humans clear inner pollution, then they will also cease to create outer pollution."

- Eckhart Tolle

taphlna jagadSara kr jaba kpl ivaiQa kI Bajayam
ihlaqaoAitz Aisqar)d ikyaa Ava\$dua salma kao .
jalayaMEant kiNzt @laant nana kI BalYna jvaalayaM
ikyaJalkt Amakotar hahakar galYna ko .

]sao@ya &at yaomanava samajakka basara h0
Sam@htl sada A&at]sam@tap gahra h0 .
ivalaata kopAND pkap ka ya@na ganal-h0
pa\$Ya kI papl saZama ka Alla ganal-h0 .

kvaca A&anata ka @yalphna koGanta bando
tUivaiQa kaoAnQa AspYTI kIalkt isadla krta h0 .
jara saa Jalkt AprakarnamalKokibastamal
javabaaMka]mDta jvaar [k gabaar laa dgaa. .

iksanaokha qaa tUrho [na Saaimyaanaahm
canma kogailastamkan lagaata Aaga Gatho tU .
caar kaDI m@pkrt kaballa tk Dalaa.
ivalaata @ya [saoAihD, samJa kr maf kr dgaa. .

haMhMdabal h@Mhka svar yakayak gal@ pDta h0
glaina evanvalnaa sao~st)dyahm .
kr@Abaya naya@ Aagaja, [na bahtl bayaraMsao
ivalaata kobadna pr Aba kBal na dalia mZ, d@o .

*klitmaa
snatk/t@lya v@la*

Earthquake Technology - Need and Development

Earthquakes are natural disasters. Humans cannot change the nature for their successful survival but can make some arrangements which are more compatible with nature. All structures are designed for various loads that may occur during their life time but among all other loads, earthquake loads are most damaging and one major problem with them is that there is a lot of random variation with time and space. Also till now there does not exist any method which can convey precisely that when an earthquake may occur, where it may occur, of what magnitude it may occur and for how long it will be there. So unlike other loads, mathematics of seismic loads is more complex and provides a big treasure for research and development in this field. One of the recent and major examples of this disaster is the Bhuj Earthquake, 2001. For a developing nation



The powerful earthquake that struck the Kutch area in Gujarat at 8:46 am on 26 January 2001 has been the most damaging earthquake in the last five decades in India. The 7.9 Richter quake caused a large loss of life and property. Over 18,600 persons were reported to be dead and over 167,000 injured; The estimated economic loss due to this quake was placed at around Rs.22,000 Crores (~USD 5 billion).

The design of structure to resist earthquakes poses problems of different kinds. The problem in earthquake resistant design is purely technical, which includes determination of the desired strength of the structure, the choice of structural arrangement and materials, the method for framing and connections, the allowable stresses and strain. The seismic hazard varies from place to place because structures and facilities vary in importance, cost, length of life of structure, ease of repair, material of construction and consequences of failure, special knowledge and judgments is required for earthquake resistance design. Now the question arises what should be the economical and safe design strategy for earthquake resistance. Answer to this is performance based design which calls for low repairable damage under minor earthquakes to prevent collapse of building under strong earthquakes. Performance requirement of any structure is decided after various considerations. For example hospitals must be designed for higher loads as compared to other buildings because after the earthquake hospitals must remain functional. The structures whose failure may cause secondary disasters must be designed for even higher seismic loads such as dams and nuclear power plants. Unlike gravity loads which have one fixed direction that is along the vertical, earthquake loads may occur in any direction, so there is always a possibility of stress reversal phenomenon. Design should account for this by providing proper reinforcement on all the faces of the beams and columns. We also know that ductile behavior is safe as compared to brittle behavior of a structure which can be taken care by providing a ductile detailing. Ductile detailing is nothing but a proper arrangement of reinforcements in the beams and columns such that the structure has a large deformation before it collapses and there will be enough warning for the people to vacate the building. It is very obvious that if a column shall fail in a building, there will be more damage as compared to a beam which on failing may cause only local failure. So the columns must be made stronger as compared to the beams, this philosophy of design is termed as the weak beam strong column design.

It is very important to have a proper design of the foundation of the structure as all loads have to go to the foundation. Failure of the foundation will be harmful from the stability point of view of the whole structure.

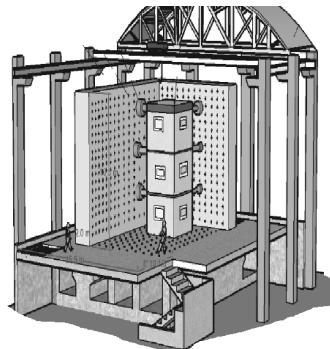
(We know very well that even when loads are not applied there may be generation of stresses in the frame structure due to settlement of supports. So the foundation settlement may be somewhat similar to this model)

During earthquakes, due to ground motion, saturated soil deposits get distorted and cause the collapse of loosely packed group of particles. The granular layers behave like a viscous liquid which is called liquefaction. The occurrence of liquefaction has been long recognized as a major hazard during earthquakes, and the recent earthquakes including the one in Gujarat in 2001 continue to exhibit liquefaction behavior. The phenomena of liquefaction describes the behavior of loose saturated sand which reaches a liquefied state when subjected to cyclic loading , heavy temping or ground vibration due to the earthquake.

IIT KANPUR EFFORT

Today, IIT Kanpur has the state-of-the-art experimental facilities and analytical tools to conduct research and development in the area of earthquake-resistant constructions. A modern earthquake engineering research laboratory is being constructed, which has equipment for studying both prototype structures in the field as well as the scaled-models in the laboratory. In the past sixteen years, IIT Kanpur has been awarded a significant number of sponsored research projects by various national agencies. These projects include studying the crustal structure of the Earth by field measurements, identifying the possible earthquake faults using remote -sensing data, measuring and studying earthquake ground motions, experimental studies on prototype and scale-model specimen, probabilistic studies of damage in structures subjected to earthquake shaking, and development of seismic codes. Amongst the most significant professional contributions made by the faculty members of the Institute are the development of Indian Standards for improved earthquake constructions, and the training of professional engineers on seismic design of buildings and bridges. Very recently, efforts are being made to set-up the National Information Center for Earthquake Engineering (NICEE) at IIT Kanpur.

Model of Pseudo Dynamic test facility at IIT Kanpur (Structure being constructed in backyard of Structural Engineering Laboratory)



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- Jain, S.K .“The Republic Day Earthquake in the land of M. K. Gandhi, The Father of the Nation”.

- **Shashank Pathak**
B. Tech - 4th year

Pamella – A Short Story



It was a sunny cold afternoon. Rambling along the streets, I reached by chance to the woods on the bank of the Ruhr and sat on a wooden bench. Gradually night was coming with her icy touch. After a long constant staring at the water when I turned my gaze towards the forest I saw her. She was surely an angel to my eyes. She was Pamella.

Next she sat beside me on the same bench. She was hardly fourteen-fifteen years old. After a while it could be seen that we are talking in such an ease as if we knew each other for a long time. I now wonder how I became so easy with a lass of a different culture and different language so quickly. In the next few minutes we started sharing our personal thoughts, personal happenings and personal life mutually. I had nothing special to share because I assumed the tiny lady to be sufficiently incapable of understanding research work. But, she had a lot of emotional gems in her chest of mind. She told me the sweetest happening of her life. She stayed in the country-side of Linich and was in love with a handsome lad named Tobias. Coming October 15th they will come to the Juelicher Church for marriage. Gradually night was coming and she swifited as Tobias was waiting for her outside the woods for a long time. Before leaving she did not forget to invite me to the Juelicher Church to witness their marriage.

On October 15th I waited in the Juelicher Church for a long time and then returned to my apartment worriedly without knowing the reason for the postponement of Pamella's marriage.

In the next weekend I went to the Linich to enquiry but nobody could give me information of Pamella's whereabouts. I felt very anxious. In the evening finally I came to know from an ancient lady that she knew a Pamella in her childhood who madly loved someone named Tobias. But Tobias abandoned her and shifted to the city of Aachen marrying the daughter of an Egyptian gold merchant only to be rich. Little Pamella could not find any reason to continue on this Earth and hid herself in the water of the Ruhr.

I could not stand there anymore and I am sure I will bear this melancholy forever in my mind.

- **Ujjal Chattaraj**
Senior Research Scholar

“ij andgal ko Khr Aaf kyanatankl Khaainyaankl @ya imsaala dM
Ksan kdrt kl Bal hmarl Kuwataaao TU jaayaa krtl hM .
na jaanao@yaaniklakarl saoSas kr koiksmat poqam dM Agar ta@
hr kba#t kl kba#tl ‘K’ saoSas haako ‘K’ pohl \$k jaayaa krtl h0 . ”

- **klitma**



Summer Camp



"Some beach somewhere...

There's a big umbrella casting shade over an empty chair

Palm trees growing, warm breeze blowing

I picture myself right there, on some beach somewhere..."

Well, post the grueling end-sems that was how I wanted to spend my summer vacations *ideally*. However, *practically* speaking, I ended up being even luckier by getting selected for the prestigious SUMMER CAMP for UG Civil Engineering students at IITK, which was indeed a life transforming experience.

The exciting annual four-week technology camp which is conducted by the Department of Civil Engineering at the *Indian Institute of Technology Kanpur* in association with *Tandon Consultants Private Limited, New Delhi* each summer since 2001 for the second year undergraduate civil engineering students from across the country, began on 3rd June, 2008. Getting shortlisted for this coveted four-week all-expenses-paid Camp was indeed a matter of pride for me as I was all set to meet leaders of the civil engineering profession in India: construction engineers, design consultants, academicians ... who have excelled in their own fields in the domain of civil engineering, and are today role models to emulate. Even greater was the thrill emanating from the thought of uniting with the brilliant students of Civil Engineering fraternity of the nation.

On the evening of the registration day, campers had an orientation session where we were briefed about the rules and regulations of the camp and were introduced to the volunteers. The hour long orientation session was enough to make us believe that the camp was indeed "physically" and "mentally" demanding and aimed at holistic development. Each of the campers was expected to exhibit exemplary discipline.



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A usual day at the exciting morning exercises started at 6:00 am with a lecture session began at 9am. The lectures not only distinguished people from industry. The lectures not only covered technical topics but social issues as well. Quite frequently CE games were organized along with technical hands-on activities which included Earthquake Antakshari, Dumb Charades on Civil Engineering terms (concrete, sand...), Group Discussion on Civil Engineering related issues, Situation Reaction exercise, Constructing a Retaining wall using thin papers and sticks, Extempore on Civil Engg. Structures (Bridges, Flyovers...), Block Building, Constructing Bridge with plastic sticks. The campers also gave a project presentation on a major construction work in their locality. After tea break at 4 pm, campers were ready on the sports field at 4.30 pm as a

camp started at 6:00 am with a lecture session began at 9am. The lectures not only covered technical topics but social issues as well. Quite frequently CE games were organized along with technical hands-on activities which included Earthquake Antakshari, Dumb Charades on Civil Engineering terms (concrete, sand...), Group Discussion on Civil Engineering related issues, Situation Reaction exercise, Constructing a Retaining wall using thin papers and sticks, Extempore on Civil Engg. Structures (Bridges, Flyovers...), Block Building, Constructing Bridge with plastic sticks. The campers also gave a project presentation on a major construction work in their locality. After tea break at 4 pm, campers were ready on the sports field at 4.30 pm as a



part of the fitness regime, all set to play variety of games including Football, Basketball, Volleyball and Cricket. The dinner at 8.00 pm was followed by some great fun time from 9.00pm to 10.30pm, where the campers interacted in an informal environment.

An added attraction was a two days long Personality Development workshop by Mrs. Rashmi Datta, which was indeed very beneficial and refreshing. For most of the campers it turned out to be a self realization session where they got to know a lot about typical human traits, thought processes and lateral thinking. A couple of days were also dedicated to visit the various labs in the institute, where they actually performed the experiments on sophisticated instruments.

But the best part according to me was the 5 days long Delhi trip, where we enjoyed to the hilt. We had field visits to various construction sites including DMRC and Commonwealth Games Village. Viewing Lotus Temple, Akshardham Temple and India Gate from Civil Engineering point of view was another high for all campers. Icing on the cake was the fun time at some of the hangout spots of the national capital. The fooding and lodging at IITD made everyone feel at home.



The 28 day long camp winded off with a cultural night where the campers showcased their talents and pledged their commitment towards the field of Civil Engineering. The valedictory function on the last day of the camp saw a gamut of emotions ranging from mirth and excitement of winners in various disciplines of the camp life to the grief and parting tears of the camp participants who had developed great bond in such a short span.

I consider my self intensely fortunate to have been a part of this once in a life time experience. Summer tans have faded by now, but memories indeed will remain for ever. While Bryan Adams croons of Summer of '69, for me summer of '08 would always be the best phase of my life.



**- Gaurav Kumar Singh
B.Tech - 3rd year**

Students, alumni, faculty, research scholars, associates & individuals are invited to *create technology having global impact with sustenance*.

Promotion of Work Experience and Research (PoWER)

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Awards and Honors

During the past one year the Faculty and Students have done the department proud several times by showing excellence on academic as well as extracurricular fronts. Some of these laurels which deserve a special mention are as follows:-

- Dr. Ashu Jain of Hydraulic Engineering received the 2009 Endeavour Executive Award.
- Dr. Tarun Gupta of Environmental Engineering has been selected for the "IEI Young Engineers Award" in Environmental Engineering discipline by the Institution of Engineers (India), Kolkata.
- Sagnik Dey, Ph.D. Student, under the supervision of Professor S.N. Tripathi has been given the INSA Young Scientist award for 2008.
- Shefali Dubey, M.Tech Student, under supervision of Dr. Tarun Gupta won the best poster award at the International Congress of Environmental Research 2008, held from December 18 - 20, 2008 at BITS, Goa.
- Lokender Singh, Mukesh Agarwalla and Pyiush Kumar Chaudhary, B.Tech third year students, under supervision of Dr. Mukesh Sharma presented indigenously developed software "CHEMTOX" (Model for Chemical Toxicity and Risk Assessment) at the National workshop of the Indian Association for Air Pollution Control and were greatly appreciated for their efforts through a citation and cash award of Rs 2100/- each.
- Akanksha Gupta, B.Tech final year student, won the best swimmer award with five individual medals in 100m freestyle, 50m freestyle, 50m backstroke, 50m breast stroke and 50m butterfly events in the Inter IIT Sports Meet'08 held at IIT Madras.
- Rahul Sharma, B.Tech-Dual Degree student, was member of the Institute swimming team which won the Bronze medal in Water polo in the Inter IIT Sports Meet'08 held at IIT Madras.

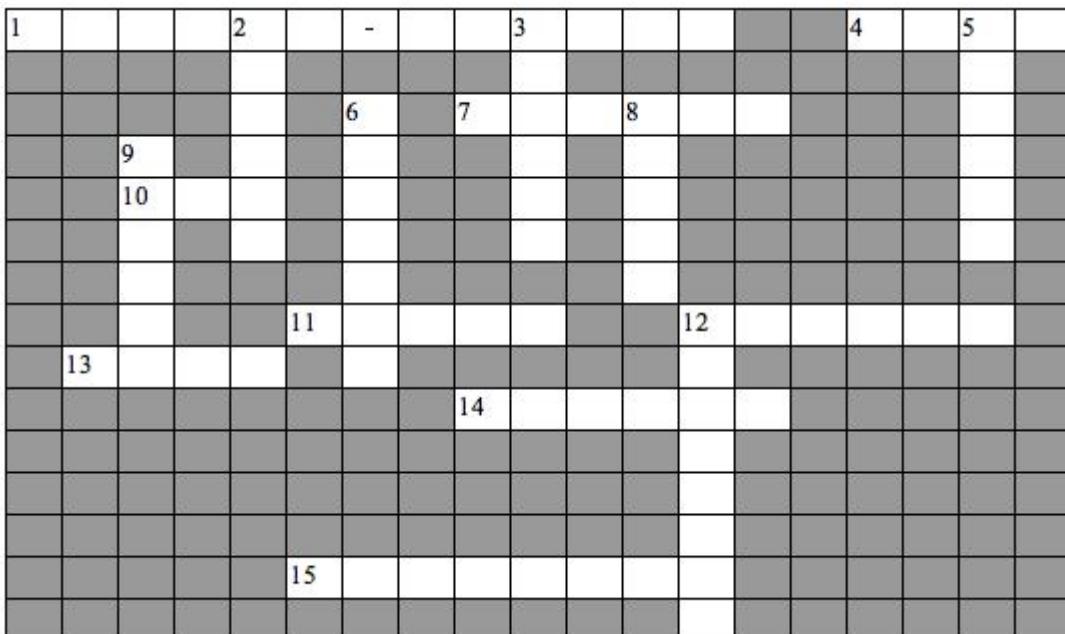


Departmental News

- Dr. S.K Jain has been appointed as the Director, IIT Ahmedabad.
- Dr. C.V.R Murty has been appointed as the Co-Chair, IIT Hyderabad Task Force.
- Dr. Partha Chakraborty has been appointed the Dean for Student Affairs (DOSA), IIT Kanpur.
- Dr. Onkar Dikshit has been appointed the Head of Department.
- Dr. Sudhir Mishra has been appointed the Convener, Senate UG committee (SUGC).
- Dr. V.K Gupta has been appointed the Chairman, Senate PG committee (SPGC).
- Dr. Rajesh Srivastava has been appointed as the Chairperson, Senate Scholarship and Prize Committee (SSPC).
- Dr. Priyanka Ghosh has been appointed as the Faculty Advisor, SOCE (Society of Civil Engineers).



Mega Structures

**ACROSS →**

1. It is longest of its kind and hangs mid air in the land of the rising sun.
4. The Beckham's bought a villa on this island.
7. It floats in water and houses birds.
10. This hotel is made year after year after year !
11. If you were in Uttarakhand and you were talking of tallest structure you would be at ?
12. It brings together the two biggest water bodies.
13. I am the roof of the world and I m still rising higher !
14. Not many people like me because I stink and I am the biggest of my kind :(
15. You sit in me and I'll drive you crazy and I am the fastest of my kind !

DOWN ↓

2. This "Boulder" stands between the Arizona and Nevada.
3. It changes water to electricity and is the longest such structure.
5. In what city is Her majesty if she is standing on "The Tower" ?
6. It's a tunnel below the channel
8. It put the World trade centre to shame, what tower is it ?
9. France's pride is floating mid air !
12. We make Malaysia proud.

ANSWER KEY

A	K	A	S	H	I	-	K	A	3	I	K	V	O	4	P	A	5	L	M
1	E	R	N	H	E	N	T	E	1	E	H	R	I	1	P	A	N	M	A
2	I	N	G	D	A	K	A	N	2	I	N	G	D	A	I	N	K	I	S
3	O	R	B	R	E	N	R	N	3	O	R	B	R	E	N	R	N	O	O
4	D	A	N	M	A	A	N	M	4	D	A	N	M	A	A	N	M	A	S
5	M	V	H	I	I	E	S	A	5	M	V	H	I	I	E	S	A	M	I
6	O	C	T	K	A	N	S	A	6	O	C	T	K	A	N	S	A	O	O
7	T	I	E	N	S	A	I	N	7	T	I	E	N	S	A	I	N	T	E
8	O	N	R	E	N	R	O	N	8	O	N	R	E	N	R	O	N	R	O
9	M	V	H	I	I	E	S	A	9	M	V	H	I	I	E	S	A	M	V
10	I	C	E	A	P	A	D	D	10	I	C	E	A	P	A	D	D	I	C
11	E	N	U	R	O	O	N	N	11	E	N	U	R	O	O	N	N	E	N
12	P	A	N	M	A	A	N	M	12	P	A	N	M	A	A	N	M	P	A
13	A	N	M	A	A	N	M	A	13	A	N	M	A	A	N	M	A	A	N
14	P	U	E	N	E	N	T	E	14	P	U	E	N	E	N	T	E	P	U
15	M	A	S	H	I	-	K	A	3	I	K	V	O	4	P	A	5	L	M



STRENGTHS '09 Team

L to R: Mahak , Agrim Gupta , Smit Chandra , Vivek Agarwal , Kirtiman Mishra , Abhinav Gupta , Dr. Tarun Gupta , Salil Goel , Ravi Raj Bohra , Puneet Chugh , K Nivas Ramdoss , T.V.N Srinivas

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Editors : Kirtiman Mishra , Abhinav Gupta , Salil Goel (UG , 3rd Year)

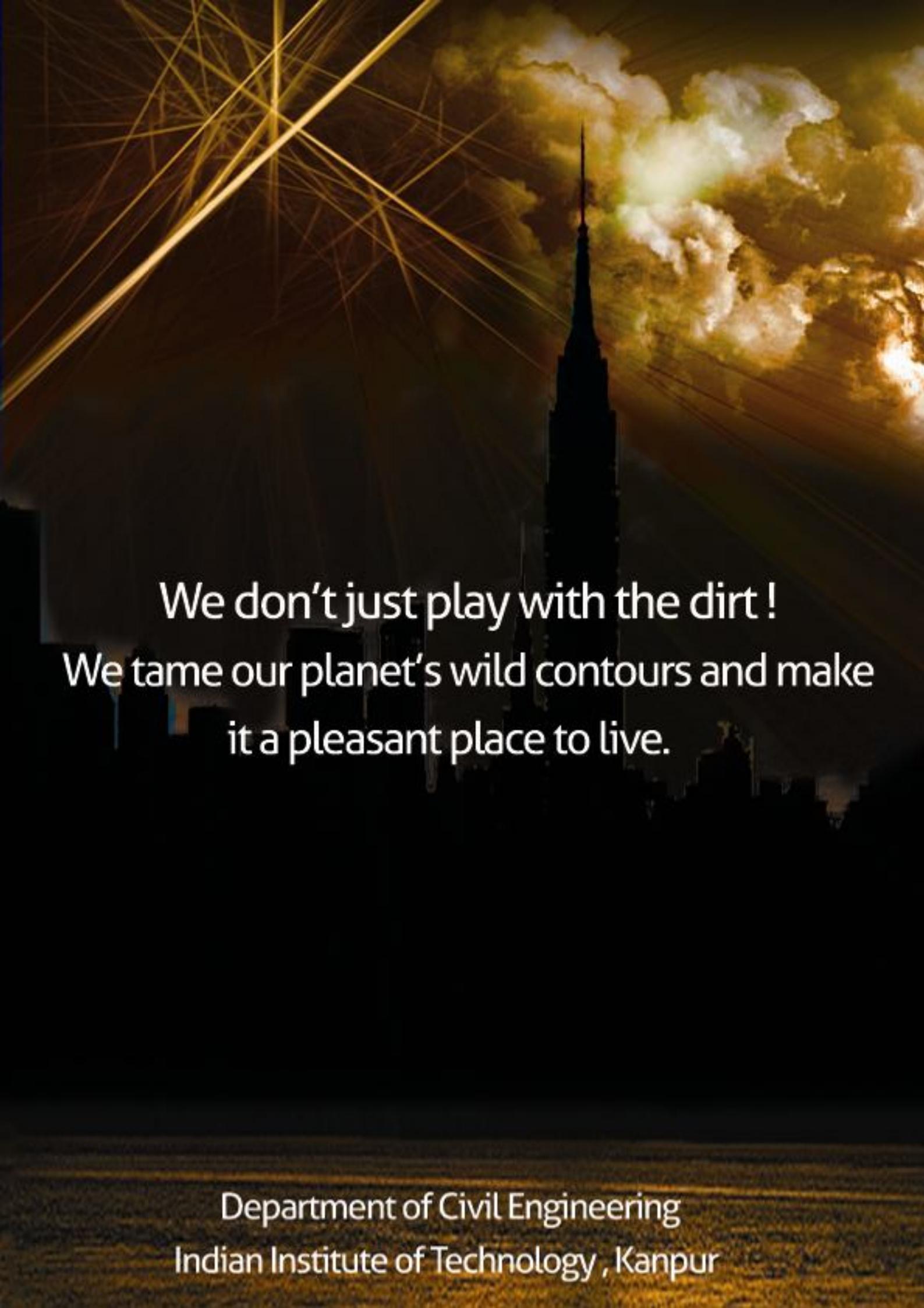
Core Team : T. V. N Srinivas (UG , 4th Year)
Archit Agarwal (UG , 3rd Year)
Vivek Agarwal , Smit Chandra , Mahak (UG , 2nd Year)
Puneet Chugh , Ravi Raj Bohra , Pranjal Prateek , K Nivas Ramdoss (UG , 1st Year)

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Indian Institute of Technology, Kanpur