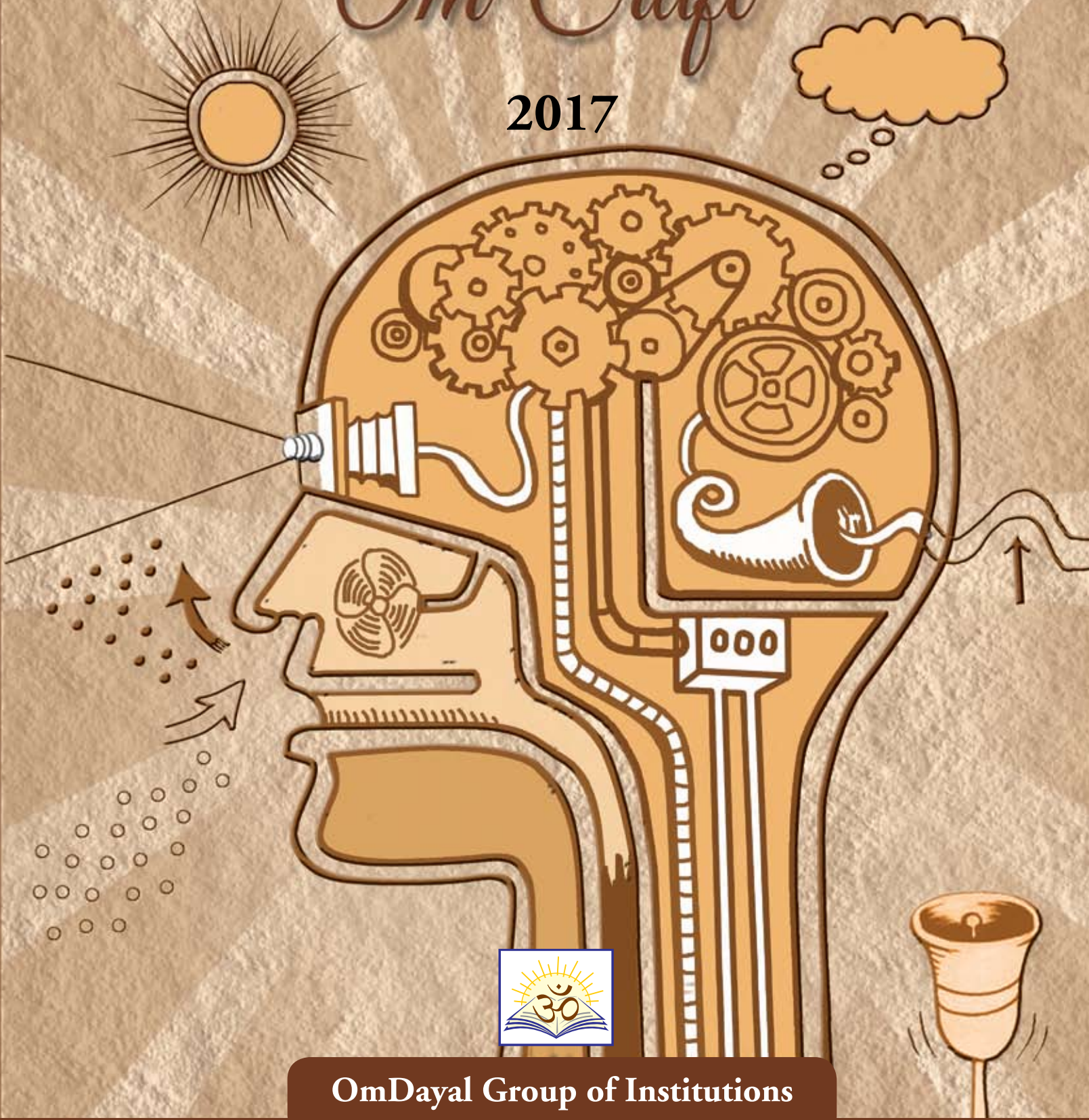
Vol. II

Om Craft

2017



OmDayal Group of Institutions

Uluberia Howrah

Editorial

Once again, it is our immense pleasure to bring out the second volume of OmCraft, the College Newsletter. As we all know, a newsletter mirrors a college- Its vision and mission. It also highlights events, activities and academic prowess and achievements. In this edition, we have tried to capture the excitement and activities of the last two years. We do hope that the newsletter encourages many more including students to use it as a platform to express their creativity. We sincerely hope that this edition makes for an interesting read.

Principal's Message

Prof. Satyendranath Chattopadhyay

Dear Colleagues

It's nice to see the rebirth of 'OmCraft'. We all are very active, but we only know our activity. To let all others know about our activities, a similar platform is required. I only hope that the spirit to continue an active platform like our newsletter, to know ourselves, will be maintained. I congratulate the team who worked tirelessly to bring 'OmCraft' to light. Best wishes to all.

Dr. Prosenjit Sen

Vice Principal's Message

I am delighted to know that the second volume of our college Newsletter for B.Tech, carrying the campus news and the achievements of our staff and B.Tech students, who earn credits for the institutions, is being released. Our institution aims to promote and impart technical and professional education and advance the students with right attitude and requisite skills to escalate them into higher echelons in their respective field. I wish all the best to those who are responsible for bringing out this letter. I assume that it would definitely be an inspiration and motivation for the other students and staffs to perform better and add on their contributions in the forthcoming issues.

Congratulations to all the contributors.

Inside this Edition

Acknowledgement

I cannot express enough thanks to my committee for their continued support and encouragement. I offer my sincere appreciation for the learning opportunities provided by members. I express my deepest gratitude to those who have given their valuable concept as technical paper or as article. All the informants deserve a 'Thank You Very Much' for carefully providing diaphanous details. Completion of this newsletter could not have been accomplished without the support of Principal,Prof. Satyendranath Chattopadhyay and Vice Principal, Dr. Prosenjit Sen. Both of them gave valuable suggestions. Keeping a hope for this type of future endeavours, I sign out.

Mr. Pranab Biswas
Coordinator

About the College

OmDayal Group of Institutions is a self–financed institute, engaged in imparting technical education. It is approved by AICTE, and affiliated to Maulana Abul Kalam Azad University of Technology, West Bengal. About two decades ago, a group of enterprising socially responsible citizens from Kolkata got together and established OmDayal Education & Research Society. The campus is located about 40kms from Kolkata and is well connected by road and railway network.

The institute is committed to maintaining high standards of conducive academic environment, processes and procedures, quality of faculty members and technical infrastructure for effective learning and self-development.

Vision

To become an institute of repute and bring about a change in the sphere of technical education in Bengal by offering a full range of programmes of global standard, and to transform the students into globally competent personalities.

Mission

- To provide state-of-the-art resource required to achieve excellence in teaching-learning and supplementary processes.
- To provide faculty and staff with the required qualification.
- To motivate for their holistic development.
- To provide opportunity to the students to bring out their inherent talent.

College Facilities

Health Center:

Medical Facilities are available in college campus with qualified nursing staff and doctor on call from super specialty hospital from the vicinity. OPD on regular basis is run for campus inmates. In case of emergencies transport is provided by the institute in order to take the students/staff to nearby hospitals.

Hostel:

Hostel facilities are available for both girls and boys in separate blocks. Both the hostels are within the college campus and are well furnished and equipped with generators.

Library:

Central Library is located on the 1st floor of Main Building. Proper signage for Books, journals, periodicals and newspapers section has been marked. Books are categorized and arranged discipline-wise in wooden racks. Separate sections for Text Books, Reference books and New Arrivals are also well maintained. OPAC for browsing library resources has been installed in reading room.

Sports:

Academic excellence is the priority. But the college also believes in the overall growth students. Excellent facilities are provided in the campus for outdoor games like football, volleyball, etc. as well as for indoor games like table tennis, carom, and chess etc. Two separate rooms have been allotted as gymnasium with modern equipments for students as well as faculty members.

Events

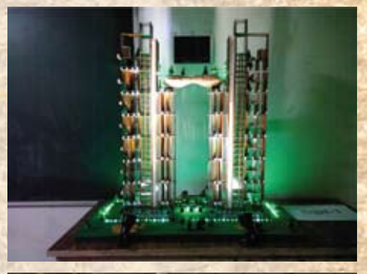
Parichay-2016

The College welcomed the fresh batch of session 2016-17 on 27th October, 2016.The programme was named Parichay meaning the acquaintance. Several events such as Dance performances (both classical and western), mesmerized the audience. Solo and group songs were also performed. The newcomers participated in 'Go as You Like' event. Mr. and Ms. Freshers were chosen by the jury members. The day was fun-filled and scintillating.

Voyage 2016

The OmDayal Tech Exhibition 'Voyage' was organized in the college premises from January 29 to February 1, 2016. A plethora of tech- models were displayed by the students. Students of all the engineering departments made the programme a roaring success through their hard work, dedication and creativity. Teachers of different departments gave their valuable suggestions and mentored the students in completing the projects. The exhibits ranged from smart solar energy driven models to the Segway PT which is a twowheeled self-balancing battery powered electric vehicle, water level detector, electronic letter box, laser security system and many more. Eminent visitors from the nearby industries witnessed and encouraged the students. Some more events like debate, group discussion, photography, poster making and innovative business idea were also a part of the programme.

Glimpses from VOYAGE



Annual Fest

Ullash 2016

The college celebrated its very first cultural fest **Ullash**, 2016 in the college premises. The two day jamboree included events like fashion show, face painting, debate, dance competition, singing competition etc. Underground Authority performed some groovy and popular numbers. The students danced to the tunes of Lakhichhara on the second day of the programme.

Ullash - Revolution 2k17

The second installment of the ODGI college fest **Ullash- Revolution 2k17** was celebrated from April 16 to17, 2017. The biggest attractions of this year were performances by Manish Karmakar, Revolution, DJ Teddy and DJ Suparna. Students of this and other colleges participated in competitive events like three minutes to fame, fashion show, quiz, debate etc. The programme was sponsored by Honda, Mio Amore and Decathlon. Winners were given token prizes. A gala event full of music, light, fun, youth and exuberance!

Annual Sports

In OmDayal Group of Institutions, sports play a significant role in developing physical & psychological health of the students. Every year two days are allotted for organizing college annual sports. This year (2017), the Annual Sports was organized on 13th and 14th February. The events included both indoor and outdoor games such as, carrom, badminton, chess, table tennis, cricket and football. Mr. Pritam Roy of CE, Mr. Dipankar Hazra of CSE, Mr. Palash Das of CE, Mr. Pranab Biswas of Physics, Mr. Sandipan Sinha of Architecture and Mr. Swapan Majumder of ECE departments were in charge of table tennis, chess, badminton, carrom, football and cricket respectively. Students showed unbounded enthusiasm in their participation in the events of their choice. The two day sports meet ended in celebration of the winners and the spirit of sportsmanship. Mementos were distributed among the winners and runners up by our respected Principal and Registrar.

The Winners

Cricket
Champion: ME
Runners up: ECE

Football
Champion: CE
Runners up: Arch.

Table Tennis (Male)
Champion:
Mohan Kukreja (Arch.)
Runner up:
Sk Abul Qasim
Azad (CE)

Table Tennis (Female)
Champion:
PrakritiBhattacharya (Arch.)
Runner up:
Pinky Jaiswal (Arch.)

Carrom
Champion:
Rahul Mondal (ME)
Runner -up:
Akash Nayak (CSE)

Badminton
Champion: Sk. Afridi and
Bhaskar Das(CE)
Runners-up: Ikbal Ahmed
and
Debaditya Maity (Arch.)

Chess
Champion:
Pankaj Kumar Jha
(Arch.)
Runner -up:
Tanay Samanta
(CSE)

DST sponsored INSPIRE Science Camp- Vigyan Manas 3 (11-16 JULY 2016)

The six day DST- INSPIRE Science Camp, sponsored by the Department of Science and Technology, Govt. of India, in association with OmDayal Group of Institutions, took off with a great inauguration ceremony and felicitation of the dignitaries present. The first Technical Session began by the deliberation by Prof. B.K. Saha, Professor, School of Oceanography, JU, on 'The Ocean as we know". The second technical session was a talk given by Mr. Amiya Kumar Kalidaha (DST, West Bengal). The topic was Idea, Creativity and Innovations. The first technical Session of day two was a lecture on 'Beauty of Plasma Physics and its Applications' by Prof. Mridul Bose of Jadavpur University. He enlightened the audience about how our planets revolve and that the Sun is in a plasma stage. The second session was delivered by Dr. Sabyasachi Poul , Scientist , Indian Centre for Space Physics who deliberated on the topic 'Groho theke galaxy o Mongole paari".

Day three started with sesion by Prof. Sarbari Guha of St. Xaviers College on 'Albert Einstein and his Works'. The second session consisted of a demonstration on Chemistry by Prof. Arindam Rana (City College, Amherst Street, Kolkata). Day four was the day which everyone was looking forward to. The students were taken to Birla Industrial and Technological Museum, Kolkata. They saw different shows namely Eggcellent show, 3D show, Coal Mine and High Voltage show and many other scientific phenomena.

On day five the first Lecture was on 'Basics of Probability' by Dr. Alakes Maity of Vidyasdagar Metropolitan College. The second part of the day was the session on 'Nature of Foothills rivers- An Overview' by Dr. Mery Biswas. The final day opened with Quizience, the quiz competition. The competitive spirit of the students was ignited as the groups clamored to answer the questions. Prize and Certificates were distributed among the students. The contribution of the DST Committee members was acknowledged by Mr. Pranab Biswas, the Convenor of the programme and all were presented with a folder. The programme ended with the singing of the National Anthem by all present and valedictory.




DST sponsored INSPIRE Science Camp- Vigyan Manas 4 (6-10 February 2017)

February 6, 2017 was the grand opening of the fourth "INSPIRE SCIENCE CAMP".

The ceremony commenced with lighting of the lamp by the chief guest Prof. Subhansu Bandhopadhyay followed by the welcome speech by the Honorable Principal Prof. Satyendranath Chattopadhyay. The first session dealt with "Voice of cosmos- the gravitational wave" presented by Prof. Soumitra Sengupta,IACS. This focused on the huge spread of universe. The second session "Science is Fun" was conducted by Mr. Amiya Kumar Kalidaha (DST, WB).

On 7th February 2017, Prof. Tarasankar Pal (IIT, KGP) presented the first session with "Interesting Chemistry". "Derivative and its interpretations" by Prof. Guruprashad Samanta started from the basic gateway of calculus-limit and ended with the significance of derivative which was described with the help of 'Population Increase Model'.

On Day three, Prof. Mridul Bose, Department of Physics of Jadavpur University presented the first session with "Beauty of Plasma". The second session "Creativity, Choice and Career in Science" by Dr. Paromita Roy, Deputy Director of JBNSTS, focused on issues related to the psychological demands of youngsters.

On Fourth Day, The first session dealt with Elementary Biology- Biodiversity, by Sir Asit Bhowmick who took nice audio visual session .Mr. Debojyoti Lahiri Department of Mathematics, OmDayal College of Engineering, conducted the second session on Boolean algebra. The Mathematics Session was followed by a Group Discussion Session in which students of each school had to submit their write ups on "Science and Civilization" and had to present a speech on that topic.

On day five, Mr. Krishnendu Chakrobortty explained simple laws of physics using everyday things. The second speaker of the day was Prof. Alakes Maity, Department of Mathematics,Vidyasagar Metropolitan College. He delivered a lecture on "A Capsule History of Calculus".

On the concluding day Prizes and Certificates were distributed by the Principal Prof. Satyendranath Chattopadyay. A special prize was given to the Most Attentive Student by the convenor Mr.Pranab Biswas.







Departmental Overview & Activities




Department of Civil Engineering

Seminars and Workshops

Capacity Analysis of Uncontrolled Intersections

A seminar on traffic engineering was organized by Civil Engineering department on 29th August, 2015. Our own faculty Mr. Srijan Mukherjee presented the seminar. Most of the civil engineering students were greatly encouraged to study traffic engineering from this seminar.

A seminar on **"Insight of Modern Techniques in Civil Engineering & Its Sustainability"** was organized by Civil Engineering department on 31st March & 1st April, 2016. Prof. Gautam Bondyopadhyay, Teacher –In Charge highlighted the common concept and emerging requirements about the insight of modern techniques in civil engineering & its sustainability. Two Faculty Member has presented their technical paper that Mr. SubrataHalder, Assistant Professor, Civil Engg. Dept., ODGI, has presented the first seminar on Artificial Recharge of Ground Water with a very clear idea regarding different ways of recharge of ground water deficiencies and Mrs. Pampa Sen, Assistant Professor, Civil Engg. Dept., ODGI, has presented the topic on "Earthquake Resisting Structure and Seismic Retrofitting" with a very clear concept regarding to make the Building as Earthquake resistant and as well as to take the ways to minimize the effect of earthquake on an existing structure. Prof. Manasendu Banerjee, Ex. Professor of NIT Durgapur has enlightened our knowledge on "Advance Technology on Present Days Construction", Lecture on 'Modern Technology on Transportation and Highway Engineering' has been presented by Mr. BarunDam (Former. Chief Engineer of PWD-Roads, WB & Consultant to many Road projects) Mr. Kashinath Bose, Executive Engineer of WBIIDC, expert from the industry delivered presentation on " Sustainable Drinking Water from Roof Top Rainwater Harvesting" and Prof. Arun Chakroborty, Prof. of IIEST, Shibpur delivered presentation on "High Performance Concrete in Today's Construction Projects".

Techniques of Concrete Testing, Chimney Design, Soil Investigation & Solid Waste Management in "Urban Planning & Its Sustainability" A seminar on "Techniques of concrete testing, chimney design,soil investigation & solid waste management in URBAN PLANNING & ITS SUSTAINABILITY " was organized by Civil Engineering department on 4th & 5th of October, 2016. Prof. Supravat Chattopadhyay, highlighted the common concept about techniques in Civil Engineering & its sustainability. Lecture delivered on 'Geotechnical Investigation & important Testing' by Prof. J.J. Mondal (Professor, Civil Engg. Dept., NITTR, Kolkata). Lecture delivered on 'Solid Waste Management is yet to establish its Priority in Urban Planning' by Mr.Tapas Ghatak (Former Head of Department-Environment Cell, Urban Development Department, Government of West Bengal, Urban Planning Advisor, GOI, GIS Expert, Member of many Professional Socities) .Lecture delivered on 'Design Challenges- Tall Chimney' by Mr. SuddhabrataGangopadhyay (Former Senior General Manager– Development Consultants Pvt LTD/Kuljian Corporation – Philadelphia,USA). – Lecture on 'Destructive & Non Destructive Testing of Concrete' has been delivered by Dr. Madhusudan Chakroborty(Former Reader of Civil Department Jadavpur

University, Former Director National Institute of Technical Teachers' Training & Research Kolkata.

Two internal faculty members Mr. Shouvik Sarkar& Mrs. Pampa Sen (Assistant Professor, Civil Engg. Dept., ODGI) has delivered lecture on the 'Use of Industrial Waste Materials in Road Construction" and 'Low Cost Housing'.

Staad Pro Workshop

A Technical workshop organized at our college on STAAD PRO software in association with IIT- PATNA and Robo Edutech India Pvt. Ltd. on 26-27th of August, 2015. The workshop was held at our college as the zonal center of this workshop. The goal of this workshop was to encourage undergraduate Civil Engineering students to have a wide area of vision in the field of Structural Design by using the Structural Engineering software STAAD PRO.

Konark Cements and AIMA presents Aadhar Quiz 2015

On behalf of All India Management Association and Konark Cements (Bharat) Ltd we are pleased to invite students of civil engineering of your college Quiz conducted across East-Central India in over 50 prestigious colleges including yours for an awareness building. It was held in our College on 06/02/15 In this Quiz students appeared at a written Test and attended quiz contest conducted by AIMA &KONARK Quizmaster at your college. This Quiz will only take about 30-45 minutes in all. All participating students awarded certificates of participation.

Our two students (Sri Priyank Patel & Sri Amarjit Nag) of 4th year attended zonal competition at Bhubaneswar.

Survey Camp

The camp site was at Durgapur, an Industrial hub of West Bengal and it was conducted from 23rd Jan'16 to 25th Jan'16. The survey work was involved for the roads, buildings on DPS and New Airport area. The terrain is undulated and Total Station used for the survey. The total team divided into several groups. Each group entrusted with various tasks like long section& cross section leveling, preparation of topo-map, total station survey, road profile preparation. Instruments used during the course are Compass, Plane Table, Auto Level, Theodolite and Total Station. The students got hand on practical experiences on survey work on undulated terrain and a lesson towards 'Building Team work'.

Industrial Visits

We take up industrial visit as part of curriculum. One such was a visit to the L&T's Metrorail (New Garia to Kolkata Airport) Via Duct Project, New Town – Kolkata on 3rd April, 2017, Students gathered details about metro rail girder, pile, pile cap, pier, pier cap, portal beam, segment and alignment change of rail and correlating the cast member with the respective drawing. We also visited the pre-cast beam yard where casting and pretensioning carried out. Students also gathered the knowledge of the viaduct erection methodology and post tensioning. The team understood the via-duct precast methodology step by step at L&T's Viaduct Pre-cast Yard site at Barasat.

A two day Educational Trip from 02/10/16 to 03/10/16 to JAJHRA COAL FIELD VISIT for Understanding the Geological Data, Civil and Structural Details, Seepage of Shaft etc of Underground Coal Mines under the guidance of Prof. (Dr.) Somendra Nath Roy and Prof. Pampa Sen was successfully conducted by the department.

A One Day Educational tour to Water Treatment Plant to Dakshin Roypur, South 24 Parganas, West Bengal under Public Health Engineering Directorate, South 24 Parganas Water Supply Circle, Govt. of West Bengal was arranged on : 3rd October, 2016 (Monday) for final year students of Civil Engineering (7th sem) department. The Engineer In-charge of the plant from P.H.E.Dte shared some useful information regarding different treatment plant units and their functions respectively. Students also visited the different units of treatment plant such as intake, alum dosing unit, clariflocculators, sludge ponds, filtration unit, chlorination unit, clear water reservoir etc. of the running project. Then, we visited the 2nd unit of water treatment plant which is under construction. L&T is the EPC (Engineering, Procurement & Construction) contractor for this 2nd unit.

Future Plans

- Enrichment of the laboratory with the advanced equipment.
- To train students towards the quintessential leap from the course curriculum to the challenges in the field.
- Propose innovative technologies for the improvement of teaching learning process
- To give students & faculty an experience in small research projects and papers
- To increase the participation in Open Online Courses for advanced learning at zero cost and to acquire new skills and improve their knowledge
- Increase MOU with industries
- Promote partnership and tie-ups across the globe with other world class Universities and institutions to explore different domains of engineering.

Department of Computer Science Engineering

Activities

1. A seminar is held on "Recent Trends in Computing" on 3rd March, 2015. Three guest speakers gave lectures of different topics. Dr. Debashish De (Associate Professor of WBUT) presented a lecture on "Mobile Cloud Computing". Mr. Soumen Knarar (Scientist at Veheretech) gave presentation on "Counter Terrorism by Efficient Computing- Case Study Voice Analysis'. The third lecture was on "Cloud Computing" by Mr. Vinayak Bandyopadhyay (Regional Operational Manager-TCS). A poster evaluation competition on "Recent Trends in Computing" was also arranged on that day.

2. A workshop is held on "Android Application Development" on 9th June, 2015 to 13th June, 2015. Students of CSE department participated and developed applications on Android software.

3. A Robotics competition named RoboTryst-2016 organized by Robosapiens Technologies Pvt. Ltd. in association with IIT, Delhi held in college.

4. Mr. Dipankar Hazra (Assistant Professor) attended "IEEE Smart Tech Workshop-2015" presented by IEEE Bangalore Section & IEEE Region 10 (Asia Pacific) on 25th and 26th September'2015 in Bangalore.

5. Mr. Suvendu Chattaraj (Assistant Professor) has presented (published) papers in international conferences like ICECE, 2014, Dhaka and the IEEE First International Conference on Control, Measurement and Instrumentation, 2016, Kolkata.

6. Amit Rauth presented a paper tited "Design and Evaluation of Text Preprocessor" in International Conference on Advances of Science and technology (ICAST 2017).

7. A workshop on "Introduction to Sensors" for students of CSE department is held on 10th October, 2015 by faculties of the department, Mr. Saikat Pahari (Assistant Professor) and Mr. Subhojit Roy(Assistant Professor).

8. Faculties of the departments are participating in a training program on SAP.

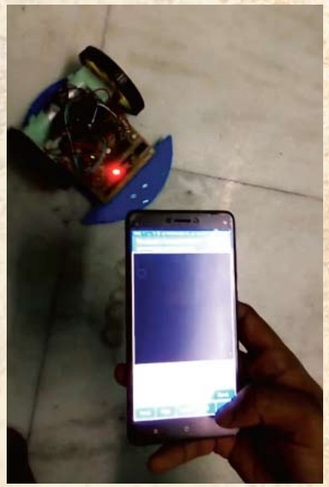
9. Mr. Dipankar Hazra and Mr.Saikat Pahari attended a 3 day workshop on "NBA accredation" conducted by Centre for Personal Transformation held in Jadavpur University.

10. Ms. Kusumika Dey participated in a 1-day seminar on "Indian IETF (Internet Engineering Task Force) Capacity Building Program" organized by ISOC Kolkata chapter and approved by Deity, Government of India.

11. Mr. Subendhu Bhattacharya, Ms. Megha Didwania (3rd year students) guided by Mr. Suvendu Chattaraj published papers in "International journal of Innovative Research in Science, Engineering and Technology", Volume 3, Issue 11" on November, 2014.

Department of Electronics and Communication Engineering

Workshops



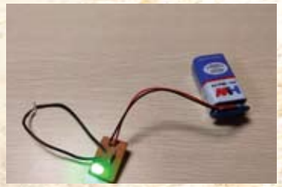
Workshop on Mobile Phone Controlled Robot using AVR Microcontroller, "MOBILEBOTICS" The Department Electronics and Communication Engineering organized a two-day workshop entitled Mobile Phone Controlled Robot using AVR Microcontroller, "MOBILEBOTICS" in collaboration with Dalvik Apps on 19th & 20th May, 2017.

In this workshop the students had learnt the basic building blocks of Robotics as well as Bluetooth communication technology and developed a variety of autonomous and wireless controlled Robots powered by an Atmel's AVR series' microcontroller. While building it, students successfully interfaced a serial Bluetooth module with PC, microcontroller and using an Android Bluetooth App controlled the Robot maneuvering.

Workshop on "LABVIEW Based System Design"

A three day workshop was organized by Electronics and Communication Engineering department in collaboration with AdLabt Solutions and was powered by National Instruments from 10th February to 13th February, 2016. This workshop was divided equally into six sessions. On the first day students learnt about LabVIEW, Virtual Instrumentations, Real time signal handling with DATA Acquisition Cards. On the second day they learnt how to use MYRIO as Power on Execution of deployed program, Wireless Data Acquisition and Control, Multisim similar to Pspice for Circuit Simulation, VLSI design and Signal Processing Techniques.

On the final day students had to do a project in groups. They did projects on:



1. Development of Barcode Scanner with webcam,
2. Development of LabVIEW based Light Intensity oriented Automated Switching system,
3. Development of colour based object sorting system using LabVIEW,
4. Development of Pattern recognition based object sorting system using LabVIEW,
5. Development of Human Skin Temperature & Muscle Fatigue monitoring system using LabVIEW,
6. Development of Smoke Detection system using LabVIEW,
7. Development of Wireless monitoring of Soil moisture and automated watering system control in agricultural field,
8. Development of Motion identification & Alarm system,
9. Development of Smart Temperature sensing system,
10. Development of In-vehicle acceleration & vibration monitoring system.

Workshop on Robotics titled 'RoboTryst-2016'

A 2-day workshop on Robotics titled 'RoboTryst-2016' technically supported by Robosapiens Technologies Pvt. Ltd. in association with IIT Delhi was jointly organized by ECE and CSE Department on 22nd and 23rd December 2015.

Expert first explained its theoretical background and then demonstrated how to make an elemental robot. Students were divided into groups and each group was given the task of making a robot which would have linear motion and could stop at an edge of a way. It was the making of the robot that not only involved assembling of hardware components but also software programming to suit ones choice.

Industrial Training

Industrial training helps the students to build their practical knowledge about the vast field of Electronics.

Students of ECE Department are given in-plant training from recognizedOrganizations like-

National Small Industries Limited. • Eastern Railway • Jadavpur University • Prasar Bharati

Department of Mechanical Engineering

Seminars and Workshops

- Two days seminar on "Overview of Industrial Design and Carbide Cutting Tools" was organisedon 1st and 2nd September, 2016 by Mechanical Engineering Department. Mr. Shyam Sundar Mukhopadhyay, Executive Director (Engg.) of EMT Megatherm (P) Ltd. was present to deliver his lecture on design practices and standardization existing in Industrial design of equipment and machineries. Mr. Saranath Bhaduri, Vice President (Manufacturing) Ceratizit (I) Pvt. Limited delivered lecture on manufacturing science and carbide tools.

- Workshop on 3-D drafting named "Overview of Solid Works" was organized by ME department on 15th March, 2017 to make students aware of the drafting practices in the existing industries and use of design software like Solid Works.

- A workshop on Non-Destructive Testing was organized with the aid of "Institute of Non Destructive Testing" on 23rd September where dye-penetration test, ultrasonic test and X ray test on welded surface was demonstrate

Industrial Visits

Regular Industrial visits on yearly basis is conducted by ME Department to industries like Mani's Baking (P) Ltd.(Parle-G) to give an idea about the product and process (quality control) in food industry.

Industrial Training

Regular industrial training for the 5th and 6th semester students is organised to reputed industries like

• BURN STANDARD Co. LIMITED, • IOCL • WPIL • BRIDGE AND ROOF(INDIA) Co. LTD • SIMPLEX INFRASTRUCTURES LTD • SINTEX and other companies.

Awards & Achievements

At OmDayal Group of Institutions we strive for excellence. Our faculty members as well as our students put in their best efforts in every field possible to live up to the standards of the institution. Following is a list of the achievements of our teachers and students, along with their exposure to different activities.

1. Students from CE department made their department proud by participating in a Green Building Seminar organized by IIEST, Shibpur premises in 2015.
2. Ritwik Das (CE) participated in 'Bridge Design Challenge' in association with Technex'15, IIT (BHU) Varanasi organized by Civil Simplified at Kolkata on 5th Jananuary'15 and awarded with'Best Design'.
3. Mr. Saikat Pahari (faculty, CSE) has received appreciation certificate from Texas Instruments for mentoring a student project in "India Design Contest'2015".
4. Dr. Dhrubajyoti Ghosh (faculty, CSE) got best paper award in Computer Engineering in IEEE CALCON 2014, National Conference on Electrical, Electronics, and Computer Engineering.
5. Students of department of CSE developed "Ultrasonic Sensor Based Power Control System using Microcontroller". This system can automatically provide power supply to the electrical devices depending on existence of person within the room.
6. Debjit Karar, Soumyajoti Mukherjee & Sounak Mondal, student of ECE, 2nd year participated in Robo-soccer competition of Karmatek 2017, Robo-race competition of Karmatek 2017 and Electrostuck competition of Paridhi 2016.
7. Mr. Swapan Majumder (faculty, ECE) has been authorized to use the title 'Chartered Engineer (India)' by virtue of qualification, professional training and corporate membership of The Institution of Engineers.
8. Mr. Swapan Majumder (faculty, ECE)participated in one week Faculty Development Programme on 'Physics and Application of Electromagnetic Wave Propagation' technically sponsored by IE(I), financially sponsored by TEQIP-II and organized by ECE Department of RCCIIT, Beliaghata, Kolkata during 4th-8th Jan 2016 at the Institute
9. Ms. Swarupa Ojha (faculty, ECE) attended TEQIP sponsored short term course on "EMBEDDED SYSTEM DESIGN" during 20- 24th June, 2016 at IIT Kharagpur.
10. Ms. Poulomi Das (faculty, ECE) attended TEQIP PHASE II sponsored one day workshop on "EMERGING PROSPECTS IN WIRELESS SENSOR NETWORK", organized by department of Instumentation and Electronics Engineering, Jadavpur University on March 10,2017.

- Attended TEQIP sponsored short term course on "EMBEDDED SYSTEM DESIGN" during 20-24th June, 2016 at IIT Kharagpur.

11. Partha Das, Anirban Sarkar, Soumyadeep Halder, Debasish Kundu, Sudipta Ghosh (faculty, ECE) , Sauvik Das Gupta, "A Novel Approach towards detecting Faces using Skin Segmentation and Template Matching", Accepted for oral presentation at the Second International Conference on Signal Processing and Integrated Networks (SPIN – 2015) & subsequent publication in IEEE Xplore Digital Library.
12. Partha Das, Annesha Mukherjee, Aniruddha Dey, Debasish Kundu, Sudipta Ghosh (faculty, ECE), Sauvik Das Gupta, "A Hybrid Color Plane approach towards Color based Object Detection and Modeling of a Real-time Gesture based Intelligent Virtual Aid using Artificial Neural Network",Accepted for oral presentation at the First International Conference on Computing, Communication, Control And Automation, & subsequent publication in IEEE Xplore Digital Library.
13. Ms. Sangeeta Jana's (faculty, ECE) paper on "Comparative Study of RF performance of DDR IMPATTs Based on Group IV-IV Materials at W-Band", Presented and Published in Proceedings of International Conference APMC (Asia Pacific Microwave Conference) December, 2016, New Delhi, sponsored by IEEE Microwave Theory and Techniques Society (MTT-S).

- Participated in a Short Term Course on "Advanced Wireless Sensor Network" at the Department of Information Technology from 26th to 29th September, 2016 under the aegis of TEQIP- II, IIEST,Shibpur.
- Participated in a Seminar on "Frontiers of RF Technology" at the Department of Electronics and Telecommunication Engineering held at Jadavpur University, 31st March, 2017.

14. Sudipta Chatterjee (faculty, ECE) attended a seminar at JIS College of Engineering for E-Learning studies on 02.05.2017 sponsored by AICTE and British Council.
15. Mr.Parthasarathi Chattopadhyay (faculty, ME) attended one week refresher course on Advancement in Non- Conventional & Renewable Energy Technologies, from 27th June- 1st July, 2016, at Kolaghat Engineering College.
16. The book ENGINEERING THERMOD YNAMICS, 2e --- by Parthasarathi Chattopadhyay, OUP, New Delhi heads the list of books recommended by MAKAUT as the Standard

Primary Texts for the Applied Thermodynamics paper of 2nd year Mechanical Engineering students.

17. Mr. Ramen Kanti De (faculty, ME)

- Attended a Workshop on Recent Advances in Automobile Engineering (RAAE) on 28th September, 2016 at IIEST Shibpur
- Attended a Workshop on Research Methodology, from 16th to 18th June, 2016 at IIEST Shibpur.

18. Mr. Ranjit Barua (faculty, ME)

- Attended a Workshop on Research Methodology, from 16th to 18th June, 2016 at IIEST Shibpur.

19. Mr. Prosenjit Sen (VP & HoD of Mathematics department) got Ph.D. from IIEST, Shibpur in 2016.

20. Ms. Sukanya Das Chandra (faculty and Hod of Chemistry) has been awarded the Ph.D Degree in Chemistry from National Institute of Technology, Durgapur on 03.11.16.

Papers written and published by our Faculty Members

1. Mr. Ramen Kanti De

- De, R. K., and Ganguly, A., 2015, "Thermal model development and performance analysis of solar greenhouse drying of Cabbage", Proc.Int. Conf. on Advances in Mechanical Engineering and its Interdisciplinary Areas (ICAMEI 2015), TF 12, pp. 82-88.
- De, R. K., and Ganguly, A., 2016, "Performance analysis of a solar hydrogen supported hybrid cold storage", Proceedings of 31st Indian Engineering Congress, December 15–18, 2016, Kolkata.
- De, R.K., and Ganguly, A., 2016 "Thermal model development and performance analysis of a solar photovoltaic supported greenhouse dryer", Int. J. Renewable EnergyTechnology, Vol. 7, No. 4, pp.361–382

2. Mr. Ranjit Barua

- Barua, R., and Mukherjee, S., 2016, "A Study of Taguchi Method Analysis for the Optimization of Factors of Eutectic Al-12Si-xCu Alloy Produced Through Powder Metallurgy Process" International Research Journal Engineering & Technology, Vol. 03, Issue 06, pp.164-167.
- Barua, R., and Dutta. P., 2016, " Development of 3D Printer With the Help of Soldering Technique", RSC Book Research Article, ISBN : 978-95-8-813- 44-8 , Sept2016.

3. Dr. Prosenjit Sen

- Maiti A, Sen P, Manna D and Samanta G P, A Predator-Prey system with Herd Behaviour and Strong Allee Effect, Nonlinear Dynamics and Systems Theory, 16(1) : 86-101, 2016.
- Maiti A, Sen P and Samanta G P, Deterministic and stochastic analysis of a prey-predator model with herd behaviour in both, Systems Science and Control Engineering: An open access journal, 4(1): 259-269, 2016.

4. Dr. Sukanya Das Chandra

- S. Chandra, R.N. Saha, P. Pal. Assessment of Arsenic Toxicity and Tolerance Characteristics of Bean Plants Exposed to Different Species of Arsenic ----- Accepted for publication in Journal of Plant Nutrition (Taylor and Francis) on 22nd February 2017.
- S. Chandra, R.N. Saha, P. Pal. (2016) Arsenic Uptake and Accumulation in Okra (Abelmoschus esculentus) as Affected by Different Arsenical Speciation ----- Bulletin of Environmental Contamination and Toxicology (Springer) 96:395-400

6. Ms. Sharanya Ghosh

- Presented the paper entitled 'Mind the Gap: Improvising A Neo- narrative and Teaching Medium for the eGeneration Learners' at a UGC State Level Seminar on July 16, 2016, organised by City College of Commerce and Business Administration, in collaboration with Rammohan College, Kolkata.

Published as post seminar proceedings,
ISBN: 978-81-928721-4-8

Earthquake Resistant Building Construction and Seismic Retrofitting

Ms. Pampa Sen
Omdayal Group of Institutions
Dept. of Civil Engineering

An earthquake is the vibration, sometimes violent to the earth's surface that follows a release of energy in the earth's crust. It is natural disasters of generally unpredictable nature. Sudden rapid shaking of earth caused by breaking or shifting of crust under earth surface occurs during earthquake.

Earthquake-resistant structures are structures designed to withstand earthquakes. While no structure can be entirely immune to damage from earthquakes, the goal of earthquake-resistant construction is to erect structures that fare better during seismic activity than their conventional counterparts.

According to building codes, earthquake-resistant structures are intended to withstand the largest earthquake of a certain probability that is likely to occur at their location. This means the loss of life should be minimized by preventing collapse of the buildings for rare earthquakes while the loss of the functionality should be limited for more frequent ones.

Effect of Earthquake on Reinforced Concrete Buildings:

Ground failure, Soil vibration, Ground liquefactions and others, Structural Vibration and damage.

Preventing Measures to Minimize Effect of Earthquake (Seismic Retrofitting):

1. One simple retrofit is to Surround the column with a jacket of steel plates formed and welded into a single cylinder. The space between the jacket and the column is then filled with concrete, a process called grouting.

2. One of the most difficult retrofits is that required to prevent damage due to soil failure. Soil failure can occur on a slope, a slope failure or landslide, or in a flat area due to liquefaction of water-saturated sand and/or mud. Generally, deep pilings must be driven into stable soil (typically hard mud or sand) or to underlying bedrock or the slope must be stabilized. For buildings built atop previous landslides the practicality of retrofit may be limited by economic factors, as it is not practical to stabilize a large, deep landslide.

3. Brick building structures have been reinforced with coatings of glass fiber and appropriate resin (epoxy or polyester). In lower floors these may be applied over entire exposed surfaces, while in upper floors this may be confined to narrow areas around window and door openings.

4. Natural gas and propane supply pipes to structures often prove especially dangerous during and after earthquakes. Should a building move from its foundation or fall due to cripple wall collapse, the ductile iron pipes transporting the gas within the structure may be broken, typically at the location of threaded joints. The gas may then still be provided to the pressure regulator from higher pressure lines and so continue to flow in substantial quantities; it may then be ignited by a nearby source such as a lit pilot light or arcing electrical connection.

Seismic Retrofitting:

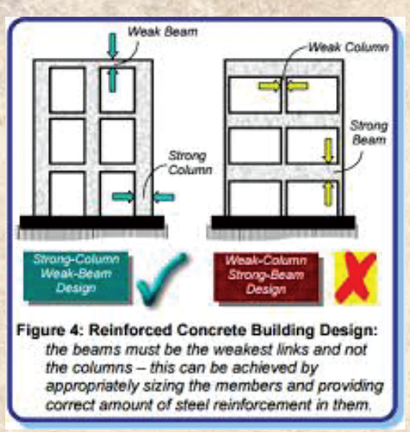
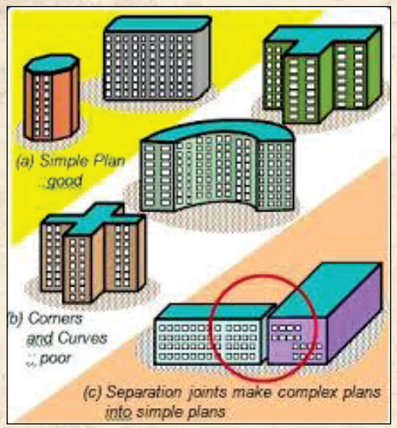
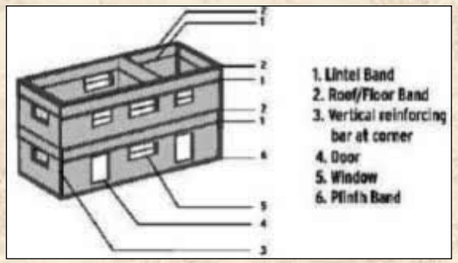
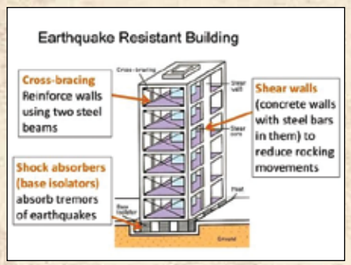


Figure 4: Reinforced Concrete Building Design: *the beams must be the weakest links and not the columns – this can be achieved by appropriately sizing the members and providing correct amount of steel reinforcement in them.*







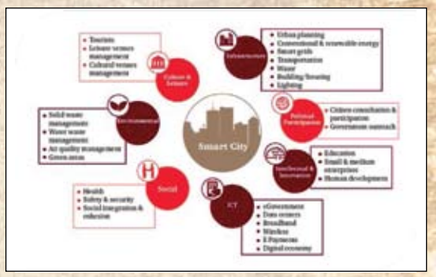
Smart City-A Footprint towards Urbanization

Ms. Piyali Dey
Omdayal Group of Institutions
Dept. of Computer Science & Engineering

The concept of Smart city is rapid step towards urbanization. To provide a decent quality of life, a clean and livable environment to the city dwellers by the means of modern technologies such as information and communication technology (ICT) and Internet of Things (IoT). There exists no unique and universal definition for smart city as it depends on the socioeconomic situation of the city and it varies from city to city and country to country, depending on the level of development, willingness to change and reform, resources and aspirations of the city residents. The basic infrastructure of a smart city depends upon information technology that offers basic services to the city residents. The Smart Cities Mission is an innovative and new initiative by the Government of India to drive economic growth and improve the quality of life of people by enabling local development and harnessing technology as a means to create smart outcomes for citizens. In the approach to the Smart Cities Mission, the objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions.

The Key Features of India's '100 Smart City' Project:

- Smart Energy
- Urban Mobility
- Smart Agriculture
- Smart Security
- Smart Building
- Smart Healthcare
- Better Public transport facility
- Good governance specially e-governance and citizen participation
- Sustainable environment



Well there are several challenges that also need to be overcome to make things happen. The Smart Cities mission requires smart people who actively participate in governance and reforms. Citizen involvement is much more than a ceremonial participation in governance. Smart people involve themselves in the definition of the Smart City, decisions on deploying Smart Solutions, implementing reforms, doing more with less and oversight during implementing and designing post-project structures in order to make the Smart City developments sustainable. The participation is must for every individual to move forward towards Urbanization.

Soft Computing Approach: A New Trend

Dr. Sandip Dey
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Dept. of Computer Science & Engineering

The idea of soft computing (SC) was first introduced by Lotfi A. Zadeh in 1981. He applied soft computing approach into one multidisciplinary system, which includes Fuzzy Logic, Evolutionary and Genetic Computing, Neuro-Computing and Probabilistic Computing. The principle of soft computing can be described as follows.

- It exploits the tolerance for imprecision, uncertainty, partial truth, and approximation to accomplish tractability, robustness and also the low solution cost.

SC plays a significant role in the area of science and engineering, but its influence is extending much farther. Some popular techniques of Soft Computing are – Fuzzy Logic (FL), Neural Networks (NN), Evolutionary Computation (EC), Support Vector Machines (SVM), and– Machine Learning (ML) and Probabilistic Reasoning (PR) and so on.

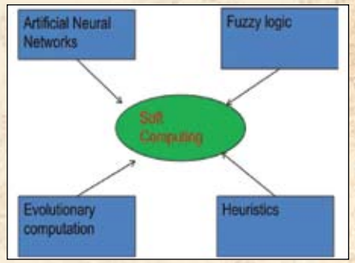

Fig 1: Soft computing approach

Soft computing techniques/tools consist of rich knowledge representation, knowledge acquisition and knowledge processing to solve different applications. The soft computing techniques can be used as individual technique/tool and it is also possible to used SC as integrated in unified and Hybrid architectures.

SC approach has been successfully applied in the following fields

- Automotive systems and manufacturing
- Image processing and data compression
- Architecture
- Decision-support systems
- Power systems
- Neuro Fuzzy systems
- Fuzzy logic control
- Process control
- Power systems
- Data mining
- Handwriting recognition

A typical application of SC approach is illustrated through the following figure.

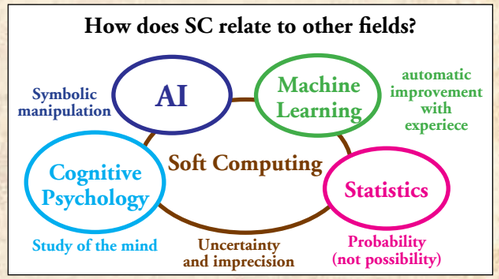

Fig 2: Relation between SC and other field

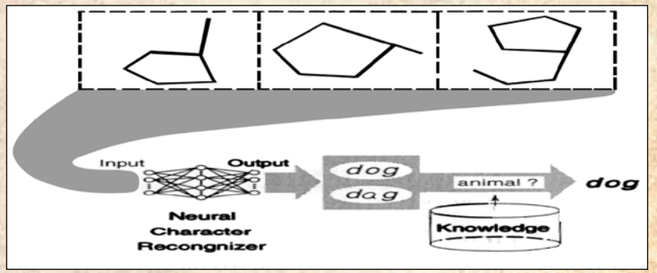

Fig 3: Character recognizer (a Soft Computing approach)

Computational Model to study Social Networks on Children's Daily Life

Dr. Dhrubojyoti Ghosh
Omdayal Group of Institutions
Dept. of Computer Science & Engineering

In India internet, social media and all of the related technology have its quickly evolving in front of our eyes and it is almost impossible to reject and hide from this new form of media. It is imperative for parents to be more aware of this new media and what it offers both good and bad effect for our children those who have spend so much time online, watching T.V. Due to busy with those activities they have faced various problem which effect their daily life like failed attempt to control behaviour, neglecting friends and families, always react to misbehave, neglecting sleep to stay alone, various health problem and many more. We have analyzed how those various problems effects their daily life with the help of Induced Fuzzy Cognitive Maps (IFCMs) and Fuzzy Relation Equations (FREs) to estimate the peak hours of school going children when they have spend too much time to interact with media in a week. We felt it to fit to use fuzzy theory in general and IFCMs and FREs in particular. IFCMs and FREs are fuzzy-graph modelling approaches based on expert's opinion. IFCMs is the non-statistical approach to study the problem with imprecise information. FREs is the mathematical modelling to better analyze the problem. IFCMs and FREs are the best suited tool when the data is an unsupervised one.

We consider the case for the year 2014 and analyze that preferences showing TV either (3-5) hours or (6-10) hours of a peek week. They spend time with indoor game like computer game or video game etc. either (3-5) or (11-15) hours. They want to surf social network like Facebook, Whatsapp etc. either (3-5) hours or (11-15) hours during a week. Similarly we consider for the year 2015, 2016 and analyze that same hour of time i.e. either (3-5) or (6- 10) hours they want to spend with watching TV. They want to like playing indoor game either (3-5) or (16-20) hours. They want to like busy with want to surf social network like Facebook, Whatsapp etc. either (3-5) hours or (11-15) hours during a week.

To reduce the problem of their study life they should follow some remedial measures which are discussed in bellow.

- Ensure your child is the minimum age required to join a social networking site.
- Never give out personal details such as addresses or mobile phone numbers on social networking sites. It's also best if your child doesn't use their real name on their profile.
- Be very wary of accepting friends who you do not know personally.
- They should never agree to meet a stranger they've been communicating online with in person.
- Keep the family computer in a public area that the family normally congregates in. The living room is typically the best place in the house to put a computer set a time limit
- Give your children something along the lines of a daily time limit or a time limit that can be distributed throughout the week at their discretion.

WiMAX- Wi-Fi Integrated Heterogeneous Network

Ms. Poulomi Das
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Dept. of Electronics & Communication Engineering

Abstract:

To provide uninterrupted service to all subscribers, we need to incorporate a low cost, flexible Heterogeneous network which can able to couple any kind of network for efficient spectrum utilization, hence improve system capacity. Wi-Fi/ Wi MAX integrated network seems to be an ideal solution as it is able to provide easy deployment, high speed data rate and wide range coverage with high throughput, low end to end delay, flat and low jitter. Wi-Fi/ WiMAX integrated network provides Quality of Service (QoS) that can support all kinds of real-time application in wireless networks that includes priority scheduling and queuing for bandwidth allocation that is based on traffic scheduling algorithms within wireless networks. In this paper, we have designed a Wi-Fi/ WiMAX integrated network and analyze the performance of different scheduling algorithms for that integrated network and enlighten that which of the scheduling algorithms gives the best performance for heterogeneous network.

Introduction:

Chronologically the high speed internet access from cable, Digital Subscriber Line (DSL), and other fixed broad-band connections are going to replace by wireless hotspots, Wi-Fi & WiMAX services. Due to advent of portable, low cost & user friendly devices users are attracted towards wireless services. As time & users demands for uninterrupted services so the last mile winner WiMAX can be able to cover large areas in metropolitan, suburban, rural or terrine with high speed mobile broadband internet access called wide area networks (WANs). Where Wi-Fi can provide high data rate in short range communication. Providing proper network services to every user, from time of registration to time to leave is the main function of a network. As both networks support mobility so integration of both networks can be a best solution to maintain proper QoS. At a time a network can be accessed by various types of users for different applications simultaneously. Managing those large numbers of traffic can be done by the scheduling algorithm. The scheduling algorithm mapped users with various service classes & add priority for source or sync. Demand for proper scheduling algorithm increased proportionally with number of subscribers & numbers of various applications in wireless communication. In a heterogeneous network there is priority not only for users but also for different access points & base stations have assigned different priority & the scheduling of both variable-size real-time and non-realtime connections is not standardized.

So still this is an open field of research and development. In this paper, we proposed a survey on scheduling schemes used in WiMAX & Wi-Fi networks for both uplink and downlink traffic. Also this paper will enlighten best suitable scheduling algorithm for an integrated heterogeneous network to maintain proper QoS for voice, data, real time & non real time applications.

Analysis of the Result:

In this paper, we have analyze the throughput, average end to end delay, average jitter for Wi-Fi to WiMAX handoff, Wi-Fi to Wi-Fi handoff, Wi-Fi to Wi-Fi handoff through WiMAX, Wi-Fi toWi-Fi handoff through WiMAX for high speed vehicle.

Throughput:

In communication network, throughput or network through-put is the average rate of successful message delivery over a communication channel. Data may be delivered over a physical or logical link, measured in bits per second. The system throughput or average throughput is the sum of the data rates that are delivered to all the terminals in a network.

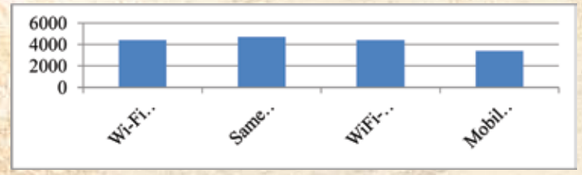

Figure: Network Performance using WRR Algorithm

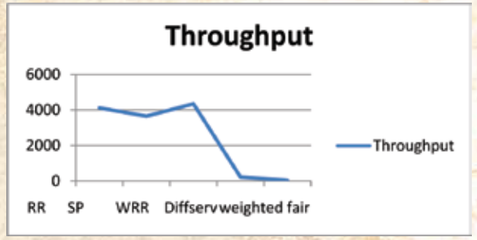

Figure: Throughput due to all algorithem Using Simulteniously (10 stations each)

Jitter:

As the packets transmit from source to destination will reach the destination with different delays. A packet's delay varies with its position in the queues of the routers along the path between source and destination and this position can vary unpredictably. This variation in delay is known as Jitter. The jitter increases at switches along the path of a connection due to many factors, such as conflicts with other packets wishing to use the same links, and nondeterministic propagation delay in the data-link layer. Jitter can seriously affect the quality of streaming audio and/or video. A network could possibly have zero Jitter. Jitter for respective precedence bits are calculated and compared.

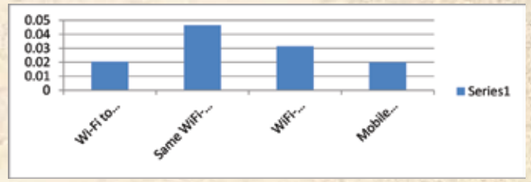

Figure: Network Performance using WRR Algorithm

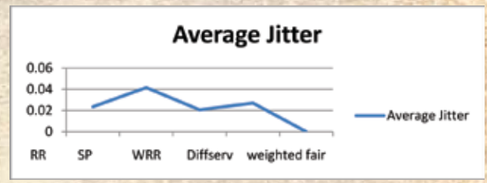

Figure: Jitter due to all algorithem Using Simulteniously (10 stations each)

End-To-End Delay:

Due to queuing and different routing paths, a data packet may take a longer time to reach its destination .The end-to-end delay experienced by the packets for each flow the individual packet delay are summed and the average is computed.

dend-end = N[dtrans+dprop+dproc]

Where dend-end is end-to-end delay, dtrans is transmission delay, dprop is propagation delay, dproc is processing delay and N is number of links.

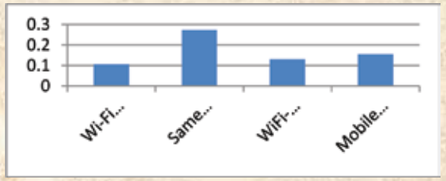

Figure: Network Performance using WRR Algorithm

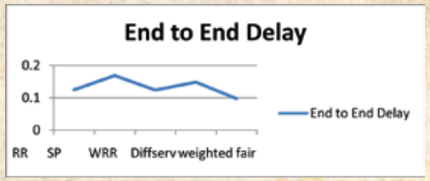

Figure: End to End Delay due to all algorithem Using Simulteniously (10 stations each)

Conclusion:

From the above result we can conclude that Heterogeneous model can able to increase the capacity of a wireless network, with efficient utilization of network resources. From the QualNet simulation we have conclude that WRR provide better performance for mixed network. We have also verified the performance of the network for various user conditions under WRR scheduling algorithm.

Random Grid Based Visual Secret Sharing (2, 2)

Mr. Swapan Kumar Majumder
Omdayal Group of Institutions
Dept. of Electronics & Communication Engineering

Abstract:

Visual secret Sharing scheme (VSS) is a secured way which protects a secret image by dividing it into a number of components or shadow images. One way to break the secret image is to expand each pixel into two or more sub-pixels. The stacking of these sub-pixels will then reconstruct the original image. Other way is to encrypt the secret using random grid that requires no pixel expansion. This paper presents RGVSS scheme. The first method uses random grid to produce to two shares of a given secret. It's a (2,2) threshold scheme which means that the original secret image will be reconstructed by the Human Visual System(HVU) when the both the shares are just superimposed or stacked. No cryptographic computation is required. The second method also uses random grid to produce to two shares of a given secret. But this scheme has been devised to the give full clarity of the image by adding negligible computation during reconstruction.

Let Us Understand What it is:

Suppose, one desires to send his photo or image electronically to somebody. Then he has to use a computer network, it may be the Internet or may be an entirely different network. Whatever it is, it may reach to unsafe hands as a network is essentially a porous one. Although I started with a photo or image but it could be anything, it could be a scanned copy of some company's sensitive database or an image of some critical information or so and so forth.

Question then arises how we can ensure safe transfer of an image through network. The answer could be the use of 'Visual Secret Sharing' technique. The very next question arises how this sharing technique ensures the safety.

Under this technique, an image which is called 'a secret' here can be divided into 2 or more meaningless pieces which are called 'shares' and they can safely be sent over any chosen network.

Let us know the peculiarity of this technique. If someone sees the individual share it appears as absurd and no can recognize it to be a piece of an image as it can be seen in my sample's output. The most stunning feature of this technique is that the original image will be reconstructed or the original image will reappear if the shares are just superimposed or overlaid one over another. No decryption is required at the receiving end.

Experimental Results: Method- 1

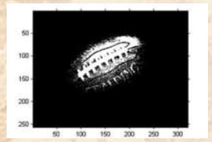

Fig.-1 BW Image of a ball

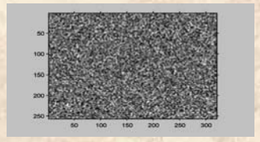

Fig.-2 Share 1

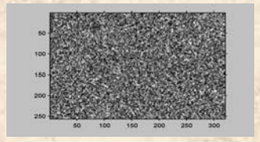

Fig.-3 Share 2

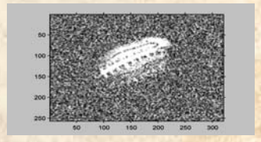

Fig.-4 Reconstructed Image of the ball

Experimental Results: Method- 2

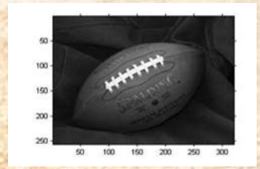

Fig.-5 Gray Image of a ball

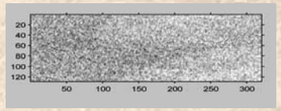

Fig.-6 Share 1

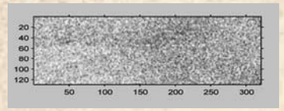

Fig.-7 Share 2

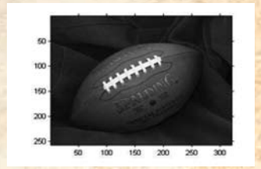

Fig.-8 Reconstructed Image of the ball

Will India's renewable energy dreams come true?

Mr.Parthasarathi Chattopadhyay
Omdayal Group of Institutions
Dept. of Mechanical Engineering

India has embarked on an ambitious project: to generate more than half of its electricity through renewable and nuclear energy by 2027.

A 5 MW grid-connected solar power plant at Khimsar village, Jodhpur, Rajasthan.
Image: Ministry of New and Renewable Energy, India

By 2027, well over a half of India's electricity will come from non-fossil fuel sources such as solar panels and wind turbines, a significant increase from the current 32 per cent.

In a draft of 10-year national electricity plan published in December 2016, the Government of India has chalked out plansto generate 275 gigawatts (GW) of renewable energy, and about 85 GW of other nonfossil fuel power such as nuclear energy, by the next decade. And that means renewable energy resources would make up 57 per cent of the country's total electricity capacity in 2027, far exceeding its commitment to the Paris Agreement of generating 40 per cent of its power through non-fossil fuel means by 2030.

The latest, ambitious targets reflect international companies' recent substantial investments in India's renewable energy sector. JA Solar has already landed solar modules of total PowerGen capacity of 1GW.

Financing:

SoftBank Energy –a conglomerate of Japan's SoftBank technology and Taiwanese manufacturing firm Foxconn, for instance, has formed a joint venture with the Indian business group Bharti Enterprises to invest in India's solar power sector, committing US$20 billion.

The French energy giant EDF Group has also pledged to spend US$2 billion on Indian renewable energy projects.They have already set foot in India, both in solar and wind-based energy, and also plan to bring about more nuclear power generation on Indian soil.

The game is on. India's own companies have been setting the pace: the multinational conglomerate Adani Group made a kick starts of the world's largest solar power plant in Tamil Nadu in 2016. Built in just eight months, this solar park can generate 648 megawatts, enough to power 150,000 homes—a remarkable footstep!

Hurdles ahead:

Analysts have opined that India has to overcome certain key challenges, including the need to extend and modernize its power grid, and invest in energy storage devices, to handle the influx of renewable energy.

It is the onus of the government and industry to change the mindset of teeming millions to make the transition from a coal-based energy sector to an increasingly low-carbon one as smooth as possible.

India has already launched a massive project to build up the transmission infrastructure through its US$3.5 billion green energy corridor programme. It follows therefore, why it should be the top-most priority for India is to complete the transmission infrastructure so that renewable power can be transmitted to where it is needed.

Investments in energy storage devices are another priority. Lack of such devices is a key reason that India now wastes up to a fifth of the renewable energy it generates.

The government should encourage battery manufacturing as the import of grid-scale batteries due to their extreme weight not only leads to high transportation costs but also creates other logistical challenges.

The Nature: Inspirational Source For Engineers

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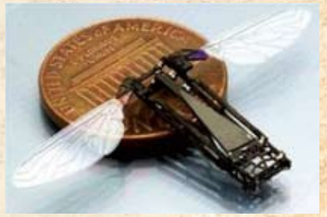
The conventional power sources that we use today in our daily life mostly have rot ational motion as output such as rotation of wheel for movements of car, rotation of propeller for motion of ships and submarines, planes etc. In plane, propulsive thrust of propeller or jet engines is used for flying the aircraft through the atmosphere. Contrary to man-made machines, the most common form of motion in nature is reciprocation motion whether it is walking of animals on the land, flying of the birds or swimming of fish.

The animals relies on reciprocating motions for locomotion on the land- for e.g. legs for walking; thrust and propulsion in air and sea – for e.g. flapping wings for flight in case of birds and oscillating fins and tails for swimming in case of fish. Tens, even hundreds of millions of years of evolution have led to these refined forms and motions that we see today in birds, insects, fish and sharks, and cetaceans such as whales and dolphins which the human race is still unable to utilize it to its fullest potential. As we all know that all the machines that are produced for performing certain activities can operate optimally only when they are run at designed conditions and environment. But the Natural machines do not suffer from this disadvantage. To incorporate the benefits of the processes of evolutionary refinement in the adaptation of living organisms, Nature may serve as the store house of inspirational examples that can help us to device techniques to enhance or supplant traditional sources of propulsion (propellers in ships and submersibles, jets and propellers in aircraft, rotors in helicopters) and lift (fixed wings and helicopter rotors).Biologists, aerodynamicists and hydrodynamicists are therefore set to undermine the hidden phenomena associated with such motions and setting some rational basis for nature's obvious choice for such motion using the well established principles of fundamental physics. This involves the rigorous use of computational fluid mechanics, experimental fluid mechanics, advanced photography techniques and prototyping and testing of models for studying the unsteady flow associated with flapping wing flight in case of birds and unsteady flow over fins and tail in case of sea creatures like fish and whales to develop machines that can overcome the problems associated with conventional power sources like propeller and jet engines.



One example of the application of such unconventional techniques in the field of aerodynamics is the design of Micro-Air Vehicles (MAVs). MAVs capable of slow or hovering flight that could be used in an urban environment to enter and reconnoiter buildings, and transmit video images or other sensor data back to the operator in real time. Such MAVs can be used for civil search and rescue operations in difficult or dangerous situations for a human personnel to operate, such as in unstable damaged building. Other uses involve traffic monitoring, border surveillance, fire and rescue operations, forestry and wildlife surveys, power-line inspection and real-estate aerial photography (McMichael and Francis 1997). In short, MAVs would be ideal for navigation through complex three-dimensional environments that groundbased remotely operated vehicles could notmanage.

Development of the Surface Metrology For Manufacturing Implant Device with the Help of White-light interferometry

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Now-a-days, implanted devices have revolutionized many branches of manufacturing technology. For making any implant device, manufacturers need the surface metrology tools which can simultaneously map all of the parameters for a range of material surfaces and over a wide range of roughness values for both flat and highly shaped surfaces. It is most important to make any bio medical device such as vascular stents, prosthetic hips, and dental implants use a variety of materials to provide the required combination of structural strength, biocompatibility, Osseo integration and in the case of joint replacements, low-friction load-bearing surfaces (1). The physical parameters such as surface topography and roughness, component dimensions, radius of curvature, and coating thickness all affect the medical benefit of these devices. White-light interferometry is an optical profiling technique which is best suited to this task. Basically this technique combines with the requisite sensitivity and accuracy for research work with the speed necessary to support both process- monitoring and quality control (QC) functions. In addition, the technology uses advanced software algorithms to simplify data acquisition and analysis.

Above figure shows the White light interferometry process. When light bounces off a thin transparent film, interference can cause light and dark bands to appear in the reflected image. These bands are called fringes, and their location is a function of film thickness. The advantages of optical profilometry are it can make a number of critical advantages over other topographic metrology techniques (2). Measurement speed is often cited as the most important of these advantages, particularly for production applications requiring 100% sampling. It has the ability to simultaneously measure multiple parameters. The instrument software can use a single data set to determine all topographic parameters of interest. These include local and average roughness, radius of curvature, dimensions of all structures (3) and components, identification and location of defects, and coating thickness and uniformity. Another advantage of optical profilometry is that it is a completely noncontact method and easy to access. Fig 2. A and B represents the measurements of a variety of implant surfaces: (A) hip implant cup and (B) knee implant. In manufacturing technology, to maintaining the accurate surface metrology is most complex to the continued the development and production of more-sophisticated medical implants. White- light interferometry is the most unique approach because it can perform the high-resolution data for many complex topographic parameters on a wide range of devices.

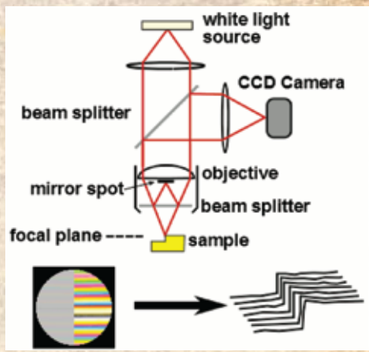

Fig. 1 White light interferometry

Fig. 2. A

Fig. 2. B

Solar Photovoltaic–Thermal Integrated Cold Storage

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The demand of refrigeration systems for food preservation has increased significantly in past few decades to ensure the worldwide food security. The post-harvest losses of food grains is one of the major threats to global food security which is more predominant in the developing countries like India, where agriculture represents a major part of the economy.

The perishable nature of the food requires a cold chain arrangement to maintain the quality and extend the shelf–life. It has been observed that most of the horticultural products require a cooling temperature ranging between 0°C to15°C for safe storage [1]. The cold storages are generally located in the rural areas for easy accessibility. At present, India has nearly 6156 number of cold storage facilities, with a storage capacity of almost 30 million tones [2] where the states like Uttar Pradesh, West Bengal, Punjab and Gujarat are the hub of cold storage industry in India. Presently almost all the cold storages are based on vapor compression refrigeration system and powered through grid electricity. Diesel generators are also used as the power back up system which increase the operation cost of the cold storages significantly. It may be noted that for a conventional cold storage located in a remote areas of Indian subcontinent, the total expense on energy alone is about 28-30% of the total expenses [2]. It is also found in literature that the refrigeration devices consume about 15% of the world electricity production [3]. Hence, the cost of electricity is a major factor to operate any cold storage facility. In future, there is a global concern over the availability of fossil fuel also.

In this context, thus solar energy is the one of most attractive and promising option for powering the cold storages. The solar energy is practically inexhaustible and non–polluting in nature. This technology is highly relevant to the Indian subcontinent as the solar energy is abundantly available in the plains of the Indian subcontinent almost round the year. As evident from literature that the mean annual solar energy is about 4.6–6.6 kWh/m2/day for different locations of India [1]. Solar energy may be harnessed either by using grid interactive or grid independent integrated solar photovoltaic system to meet the energy requirement of a conventional cold storage or using solar thermal collector to meet the heat load of the generator of a vapour absorption refrigeration system based cold storage as shown in Fig.1.

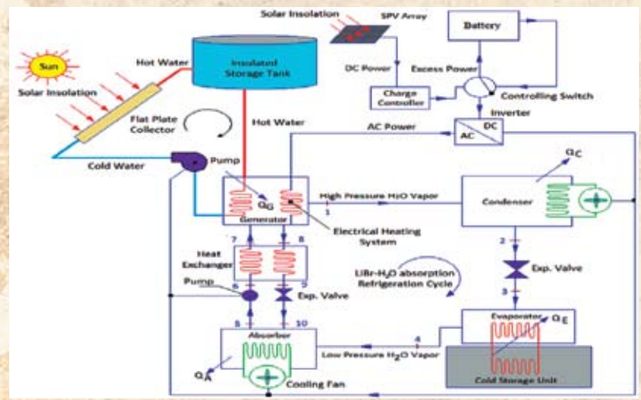

Fig. 1: Scheme of a solar photovoltaic–thermal integrated cold storage

The cold storages based on vapour absorption refrigeration system are driven by low-grade energy in the form of heat, hence; the electrical power requirement is almost negligible compared to that of a vapour compression cycle based conventional cold storages. The grid interactive photovoltaic power system can also send the surplus electricity into the electricity grid thereby increasing the return on investment. However, in near future, the grid independent, vapour absorption system based cold storages powered with SPV system with suitable backup system may be the more viable option in the

rural areas of the developing nation like India like India, where a considerable fraction of rural population does no enjoy the grid electricity.

Mathematical models in Mathematical Ecology: Historical background

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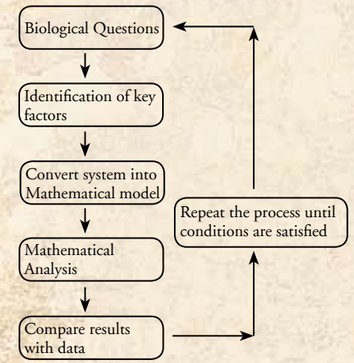
Introduction:

"Among all mathematical disciplines the theory of differential equations is the most important" – Marius Sophus Lie.

Many of the principles in science and engineering are based on relationships between changing quantities. In mathematics derivatives represent the rate of change; therefore such principles can be expressed in terms of differential equations.

Modeling is the process of writing a differential equation to describe a physical situation. A mathematical model can be described as an abstract representation of a real world situation that uses mathematical language to describe the behavior of a natural or physical system.

In case of mathematical modeling we should follow the following algorithm:-



One of the important applications of mathematical modeling is in the field of population biology. Whether we are dealing with a human population, population of endangered species, bacterial or viral growth and so on is a reflection of their use in helping to understand the dynamic processes involved and making predictions. Here we will be discussing some basic mathematical models of Mathematical Biology.

Malthusian Growth Model:

To begin with we consider the simplest of all, the Malthusian Growth model, sometimes also called the exponential Growth Model. The model is named after Thomas Robert Malthus, the author of "An essay on the principles of population (1798)".

Let $N(t)$ be the population of a species at time$t$, then according to Malthus the rate of change $\frac{dn}{dt}$ = births-deaths is a conservation equation for the population.

If birth rate is represented by the constant b, and death rate is represented by the constant d, then $\frac{dn}{dt} = bn - dn$ with initial population $N(0) = N_O$.

One can easily see that the solution of the above differential equation is $(t) = N_O e^{(b-d)t}$.

Thus if $b > d$ the population grows exponentially and if $b < d$, the population dies out. This approach due to Malthus is fairly unrealistic. There are certain conceptual defects in the model. One of the important defects is that when the population attends a significant level there is a lack of food, space, water, and other resources. The individual in the population fights among themselves to get suitable shares of limited resources. This is not explained in Malthus model and thus a new model in which the growth process is compensatory was introduced by Verhulst in 1838.

Logistic Growth Model:

In the long run of course there must be some adjustment to such exponential growth which is seen in the Malthusian model. Verhulst proposed that a self limiting process should operate when a population becomes too large.

He suggested the mathematical model:- $\frac{dn}{dt} = rN(1-\frac{n}{k}), N(o) = N_O$, where r, k are positive constants. This he called the logistic growth in a population. Here the birth rate$r\ (1-\frac{n}{k})$, is dependent on N. k is the carrying capacity of the environment which is usually determined by available resources. One can see that the solution of the above model is $N(t) = \frac{N_O k e^{rt}}{k+N_O(e^{rt}-1)} \longrightarrow k \text{ as } t \longrightarrow \infty$

Thus logistic model appears to be more realistic as it gives the bounded solution as $t \longrightarrow \infty$. Unlike Malthusian model where the two extreme cases that is either exponential growth or extinction the Logistic Growth model produces a real approach.

So far we have discussed models representing the population dynamics of single species. There are also several models representing the population dynamics of multi species. One of such basic model is the model due to Lotka and Volterra. I am not going to analytically explain the solutions of the system; instead I am giving just the representation of the terms and explaining the terms associated with the model.

Lotka-Volterra Model:

The model is also known as Prey - Predator model. This model involves two species, one is prey and the other is predator. The

$$\frac{dn}{dt} = N(a - bP), \qquad \frac{dp}{dt} = P(cN - d),$$

population dynamics is represented by the following system of differential equations:-

Where N = It represents the prey population
P = It represents the predator population
a = rate of growth of prey in absence of predator
b = Prey mortality rate
c = efficiency of conversion from prey to predator
c = Exponential death rate of predator in absence of prey

Conclusion:

Mathematical ecology is a fast going, well recognized and one of the most exciting modern applications of Mathematics. Mathematical model is the most important factor of development of this branch. The models show how a process works and then predict what may follow. Mathematical model plays an important role in realization of mathematical phenomenon. In this article I have considered just a few basic models just to emphasize the use of mathematical modeling in Mathematical ecology. It is impossible to cover all of the topics in an article of this size. One can follow the books "Mathematical Biology: 1 An Introduction" by J.D. Murray and "Elements of mathematical ecology" by Mark Kot," Mathematical Modeling" by J. N. Kapur for detail understanding of the subject.

Electrical and photovoltaic characterizations of Methyl Violet dye based Photo electrochemical cell

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Aim of the Project:

The aim of the present work is to study the development of Methyl Violet dye based PEC for photovoltaic operation. I n this study, preparation and characterization of Methyl Violet dye based solid state PEC for photovoltaic application is done. Different photovoltaic parameters has been measured and compared for different concentration of dye.

Introduction:

Methyl Violet (shown in Fig.1) has a reddish purple colour. This colour is due to the presence of chromophores. Low band gap chromophores acts as a photon sink where charge separation occurs, and their migration in opposite direction is facilitated by the presence of donor and acceptor units.

Recently organic and polymer photo conductors have been widely used for large area optoelectronics devices such as xerographic photoreceptors and photo detectors, solar cells etc. In this application, generally photoconductive amorphous thin films including molecularly doped polymers dispersed in a polymer matrix are sandwiched between two electrodes at least one of which is transparent conductor. However the study of steady state photoconductivity measurement in solid state PEC in visible range is rather scarce.

Measurement:

Both electrical and optical characteristics of the prepared cell were measured. The measurement that have been carried out are-

1. Short Circuit current measurement
2. Power Curve
3. Photo current growth and decay

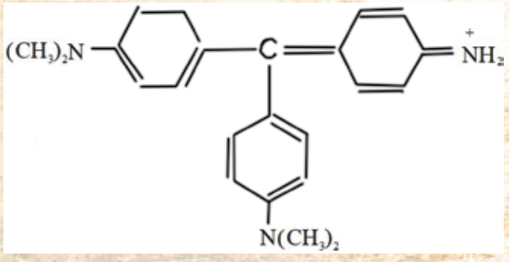

Fig1: Structure of Methyl Violet which is Triphenyl Methane derivative soluble in acid and water with an absorption peak 580 rim in aqueous solution

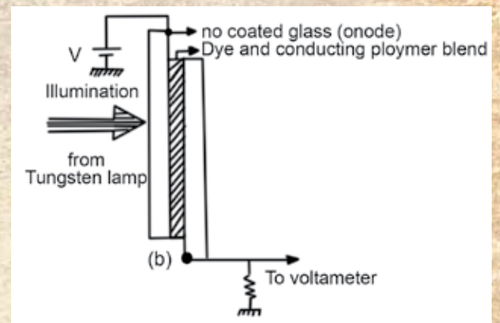

Fig 2: Structure of photo electrochemical cell

Table For Different Photovoltaic Parameters:

Concentration of dye	V_{oc} (mV)	J_{sc}(nA/cm)	Fill Factor	% ($^{x}10^{-6}$)
2 mg	15.36	108.96	0.83	1.38
4 mg	137.00	452.27	0.78	48.33
6 mg	40.90	232.38	0.75	7.13

Conclusion:

Here we have investigated Methyl Violet dye based PEC device for photovoltaic operation. The device has been fabricated by spin coating technique with ITO and Al as two electrodes. The low cost and easy processing technique, and the use of low cost materials, is quite interesting to work with this. Here we experimented by changing the concentration of the dye and has store that efficiency increases by decreasing the concentrations. And that is the newness of this experiment. There are enough possibilities to do work by changing electrode combination to enhance the quantum efficiency.

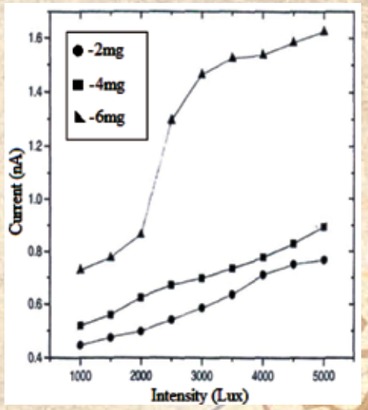

Fig 3: Variation of short circuit current with intensity

Fate of Rare Earth Elements in Soils and Plants

Dr. Sukanya Das Chandra
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Introduction

Rare earth elements (REE) are a homogenous group of 17 chemical elements in the periodic table with similar physicochemical characteristics generally having an oxidation state "+3," and a small but constant reduction in the ionic radius, with an increase of the atomic number, which is called "lanthanide contraction". Of these elements, 15 belong to the group of lanthanides with atomic numbers between Z=57 and Z=71, as follows: lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), promethium (Pm), samarium (Sm), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), and lutecium (Lu). Two more elements join them: scandium (Sc, Z=21) and yttrium (Y, Z=39). The REE are soft elements, malleable, ductile, and considered great electrical conductors, which allow their application in many modern industries including chemicals, consumer electronics, clean energy, transportation, health care, aviation, and defense and in agricultural fertilizers.

Sources and Fate of Ree in Soils

REE are found in more than 270 minerals in a wide range of concentrations. 95% of all mineral resources containing REE in the world are concentrated in only three minerals: bastnasite, monazite, and xenotime. The REE have high affinity for oxygen and are therefore found mostly in phosphatic minerals, as well as in carbonates, fluorides, and silicates. An enhanced fraction of REEs is bound to Fe-Mn oxides. REEs that are adsorbed may precipitate in the form of hydroxides, dehydrated hydroxides, or insoluble carbonate, and then desorption processes are limited. The fast increase in the exploration of mineral resources that contain REE, along with their constant application in the modern industry and everyday life, can contribute to an increase of these elements in ecosystems.

Fig. 1 Graphical illustration of the sources of REE to soils, where they undergo a series of reactions in the soil profile prior to entering the main environmental compartments.

Ree Uptake in Plants:

REE concentrations in plants vary according to the contents of these elements in the environment and among different plant species. Plants have a range of features that affect REE redistribution, especially those related to the presence of apoplastic barriers. Initially, the apoplastic barriers situated in the roots are the first obstacles for these elements to reach the xylem, thus impairing their translocation to remaining plant organs. REE absorption occurs also through foliar applications.

Effects of Ree on Plant Metabolism:

i. It has been broadly reported that REE positively influence plant growth, increasing biomass production. However, many of these positive effects are only observed at low doses of the REEs, with negative effects becoming apparent as dosages are increased. Reported detrimental effects of elevated levels of REEs on plants include: decreased growth, root function and nutritional uptake; reduced root elongation by Er; decreased seed germination (La and mixed REE solution); and chloroplast damage by Tb.

ii. Increase the proline content which has a high ability for hydration, making the plant more resistant to water stresses.

iii. Since REE have the chemical property of electric conductors so increase the potential quantum yield of photosystem II favoring the whole photosynthetic process, and consequently the biomass production in plants.

iv. Due to chemical similarity with Ca, La in special, can act as Ca replacements, mainly in plant structure, bonding with cell walls in which Ca would be part of the composition and replacing it in its function as a secondary messenger. These destructuring processes are commonly verified in cell walls and also occur frequently in chloroplasts, mitochondria, and nuclei that lose their original format. The main reports of REE effects on membrane stability are associated to alterations of stability, functionality, and permeability.

Conclusions:

Although several findings reported positive effects of REE on plant growth, many questions about their biological role remain unanswered. Therefore, studies concerning the actual mechanism of action of these elements on cellular and physiological processes should be further refined. Even more urgent is to unveil their chemical behavior in soils and the ecological and human health risks that might be associated with the widespread use of REE in our modern society.

Cultivating Confidence and Promoting Learner Autonomy in the Language Lab

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Dept. of Humanities

Language is a significant part of a person's identity. It's through language that we communicate to others who we are and through social interactions with others we learn more about who they are. Language is an important tool which if effectively used can create a stress free interactive class. The Language Lab acts as a powerful environment for effective Language Learning to take place for the adult ESL learner.

Students have both a positive, accurate belief about themselves and their abilities and also the commitment and responsibility that comes when they set themselves worthwhile goals. According to Reasoner, founder of the International Council for self esteem, there are five components of self esteem that can be dealt in the Language Lab.

1) Security- Knowing that I am safe, physically and emotionally. 2) Identity- Knowing who I am. 3) Belonging- Knowing others accepts me. 4) Purpose- Showing confidence and faith in the abilities of the students to set realistic goals. 5) Competence- Providing incentives, support and giving feedback.

The 'I can do it' spirit is the driving force that leads to the accomplishments of successful tasks assigned to the students. Here the attitude of the teacher towards the learner is the key issue. Something that we can do in the Language Lab is to inculcate a sense of freedom allowing the students to explore their own communicative abilities through various activities. In order to help the students shed their inhibitions, the teacher who acts as a facilitator, can make positive comments, providing encouragement, celebrating when major class goals have been achieved. Various Language Lab activities which involve the students in group activities like Drama, Presentations and pair work like interviewing each other, Role Play help the students come out with their creativity and innovativeness.

Such speaking Activities can help them to acquire a sense of self esteem and gain self confidence. This also helps them to come out with their own authentic thinking in a given situation keeping in mind the learning that they bring along with them.

DRAMA a powerful tool for creating an innovative, interactive fun filled class can also be used to create a language learning situation in which the students generate and respond to their own language needs. It is an effective way where shy students can overcome their inhibitions and be an active participant.

Drama is fun, combining education and entertainment to create a situation where learning takes place naturally through a desire to communicate. At this stage the teacher should not look out for accuracy but fluency at expressing their thoughts which is evitable when students are given any topic for drama.

ROLE PLAY is another effective tool to elicit language in a familiar situation using language that the learner is comfortable with. Here, it has been seen sometimes though students resort to use of their mother tongue, efforts are made to communicate in English.

GROUP PRESENTATIONS is another way where the students exhibit their group dynamics and the cohesiveness of the group emerges. Students form their own heterogeneous groups. Here the confident speaker who maybe the Leader guides the reticent student motivating him/her to be an active participant of the group activity. Learner autonomy is automatically projected as the students find ways to overcome their weaknesses and exhibit tangible strengths through their deliberations. This they do to maintain the standard of the group thus gaining self confidence.

INTERVIEWING EACH OTHER is an activity whereby students are assigned roles of interviewer and interviewee. They can be given the role of interviewing a famous writer, sportsman, politician or a movie actor. Here the students exhibit their own reflections about the particular person. Students are allowed to select their choice of person which helps them to communicate efficiently and the goal of the task is thus accomplished. Through this task Learner Autonomy is developed.

Thus the Language Lab is a high activity zone which can be used effectively to help the Second Language Learner to shed off their inhibitions in order to develop confidence and Communicative competencies.

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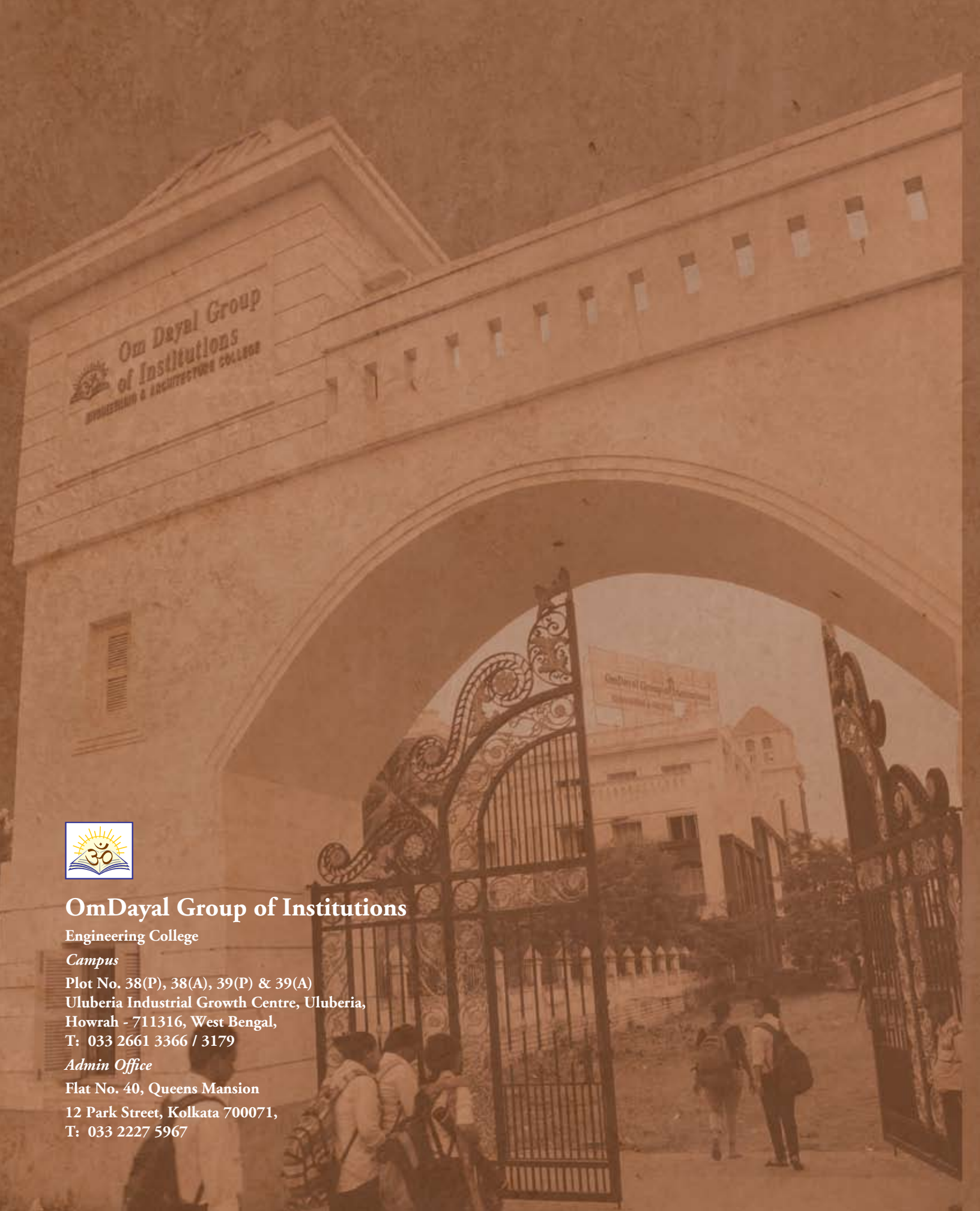

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