NIRZER

NEWSLETTER OF MECHANICAL ENGINEERING DEPARTMENT

CONGRATULATIONS

Dr. Rajesh Suresh Prabhu Gaonkar

Professor & Head, Mechanical Engineering Department,
Farmagudi, Ponda - Goa
Goa College of Engineering

First awardee of Goa State Award for Meritorious Teacher in Technical Education for the year 2015

Events & Activities

DATES	EVENTS
10th July, 2015	Van Mohatsav 2015
11th July, 2015	Visit to IIIE Headquarters.
14th July, 2015	Final Year Project Exhibition 2014-2015.
19th August, 2015	Talk on "Ethics and Motivation".
22nd and 23rd August, 2015	Go Kart Design Challenge 2015.
24th August, 2015	Field Visit to Crompton Greaves Limited, Bethoda.
25th August, 2015	Talk on "Higher Education Opportunities in Europe".
4th September, 2015	Seminar on "Advanced Mechatronics System".
8th September, 2015	Mesa Council Installation 2015-16.
11th September, 2015	MESSERGI Activity: Exhibition by Gujarati Samaj Special School
10th October, 2015	MESSERGI Activity: Book Donation Drive at Valpoi.
30th November to 5th December, 2015	Two-Week ISTE STTP on "Technical Communication".
7th to 18th December, 2015	TEQIP - II STTP on "Modelling and Simulation".

Departmental News

- Dr. Rajesh Prabhu Gaonkar has been recognized as PhD Research Guide by Goa University in the subject of Mechanical Engineering w.e.f. 21st January 2015. At present two candidates are enrolled for PhD under him.
- Dr. Rajesh Prabhu Gaonkar became the first recipient (awardee) of Goa State Award for Meritorious Teacher in Technical Education for the year 2015. This was presented to him at the hands of Honorable Chief Minister of Goa State Shri Laxmikant Parsekar, at the liberation day state level function held on 19th December 2015. This is awarded in public recognition of valuable services to the community as a teacher of outstanding merit.
- Dr. Shridhar D. Mhalsekar was appointed as coordinator of the Internal Test exams. He was assisted by Prof. Varun Mahabal.
- Dr. Rajesh Prabhu Gaonkar was appointed as Dean, Faculty of Engineering, Goa University with effect from 24th August 2015.

- **Dr. Rajesh Prabhu Gaonkar attended Coordinators' Workshop on Technical Communication from 24th August to 28th August, 2015 at Indian Institute of Technology, Bombay.**
- **Prof. Manohar Shankar and Prof. Mahesh Caisucar attended 2 days training program on KUKA Industrial ROBOT from 3rd to 4th September, 2015. The two day training was on KUKA SimPro simulation software.**
- **Dr. Suraj Rane was appointed Chairman of the Board of Studies in Mechanical Engineering with effect from 24th September 2015.**
- **Dr. Rajesh Prabhu Gaonkar, Prof. Milind Sakhardande, Prof. Mahesh Caisucar and Prof. Harichandra Chandekar participated in a two-week ISTE STTP on "Technical Communication" conducted by Indian Institute of Technology, Bombay from 08th October to 5th December 2015. Dr. Rajesh Prabhu Gaonkar was remote centre workshop coordinator.**
- **Dr. Rajesh Prabhu Gaonkar was Advisory Committee Member and Technical Committee member of 3rd International Conference (ICIE 2015) and 57th National Convention of Indian Institution of Industrial Engineering (IIIE) on "Industrial Engineering" hosted by S. V. National Institute of Technology, Surat (26th – 28th November 2015). He also chaired one of the sessions.**
- **Dr. Rajesh Prabhu Gaonkar and Dr. Suraj Rane attended the 3rd International Conference on Industrial Engineering (ICIE-2015) which was organised by IIIE, NHQ Mumbai and held at SVNIT, Surat from November 26th -28th , 2015.**
- **Prof. Milind Sakhardande and Prof. Mahesh Caisucar have registered for PhD at Goa University.**
- **Two weeks TEQIP-II workshop (for faculty) in association with Walchand College of Engineering, Sangli was conducted from 7th to 18th December 2015 on "Modeling and Simulation". Dr. Rajesh Prabhu Gaonkar was the coordinator.**
- **Dr. Rajesh Prabhu Gaonkar, Dr. Vinay Shirodkar, Dr. Suraj Rane, Dr. Akshay Nigalye, Prof. Milind Sakhardande and Prof. Pratik Sawardekar were the resource person from Mechanical Engineering Department for two weeks TEQIP-II STTP for faculty on "Modelling and Simulation", at GEC.**
- **Shridhar D. Mhalsekar was a participant for Two weeks TEQIP-II workshop on "Modeling and Simulation".**
- **Dr. Rajesh Prabhu Gaonkar was appointed Member of Purchase Advisory Committee of GEC.**
- **Dr. Rajesh Prabhu Gaonkar was appointed Member of Unfair Means Inquiry Committee of GEC. He was also appointed as Chairman, M.E. admission and B.E. Direct Admission (in GEC).**
- **Dr. Akshay Nigalye was remote centre workshop coordinator and Prof. Milind Sakhardande was the remote centre coordinator for two-week ISTE STTP on "Engineering Physics" conducted by Indian Institute of Technology, Bombay from 8th to 18th December 2015.**

- **Dr. Rajesh Prabhu Gaonkar was appointed as Member of Research Cell w. e. f. 22nd December, 2015.**
- **Dr. Rajesh Prabhu Gaonkar held the charge of Principal, GEC from 24th to 31st December 2015.**
- **Prof. Milind Sakhardande and Prof. Mahesh Caisucar were coordinator for Tandav-2015.**
- **Dr. Rajesh Prabhu Gaonkar was the Chief Guest and inaugurated the Diwali product exhibition organized by Gujarati Samaj School for Specially Abled Children at Margao, Goa.**
- **Dr. Vinay Shirodkar was appointed as Institutional Coordinator for accreditation process of National Board of Accreditation (NBA) with effect from 20th October, 2015.**
- **Dr. Akshay Nigalye was appointed as Departmental Coordinator for National Assessment and Accreditation Council (NAAC).**
- **Prof. Milind Sakhardande was the remote centre coordinator for two-week ISTE STTP on "Introduction to Structural Engineering" conducted by Indian Institute of Technology, Kharagpur.**

Sports Activities

- **Akash Fulkar, T.E. Mech., participated in the inter college Swimming competition organized by Goa University. He won 2 gold medals.**
- **Bandodkar Kalpesh, F.E. Mech. and Mayur Vengurlekar, B.E. Mech., reached the third round in the inter college Table Tennis competition organized by Goa University.**
- **Rushab Phadte, S.E. Mech., Atishay Naik and Pranay Naik, both B.E. Mech., participated in the inter college Body Building competition organized by Goa University.**
- **Akshay Walvekar, S.E. Mech. and Amey Naik, B.E. Mech., participated in the inter college Power Lifting competition organized by Goa University.**
- **Pranav Silimkhan, F.E. Mech., participated in the inter college Badminton competition organized by Goa University.**
- **Jayesh Mayenkar, F.E. Mech., Shashank Gaude, S.E. Mech., Leslie Furtado, Dusu Genda and Rohit Malik, all B.E. Mech., participated in the inter college Football competition organized by Goa University.**
- **Prof. Gajesh Usgaonkar, Dr Shridhar Mhalsekar and Prof. Harichandra Chandekar participated in All Goa Civil Services Table Tennis Tournament 2015 organized by Directorate of Sports and Youth Affairs at Indoor Stadium, Campal. Prof. Harichandra Chandekar secured third place.**
- **Dr. Raghavendra Naik participated in All Goa Civil Services Chess Tournament 2015 organized by Directorate of Sports and Youth Affairs at Youth Hostel Miramar. He secured 6th Place.**
- **Prof. Mahesh Caisucar participated in the Dr. Ramani Goa Marathon 2015 held on 1st November at Ponda, Goa. He successfully completed the 10 kms run with a timing of 1:07:53.**

International Conference Papers

1. **Joao Gonsalves and Rajesh S. Prabhu Gaonkar, "Using Evidential Reasoning Approach for Supplier Selection", *in proceedings of the 3rd International Conference on Industrial Engineering (ICIE 2015)*, 26 – 28 November 2015, Surat, pp. 8-12.**
2. **J onathan M. Menezes and Suraj S. Rane, "Comparing Exact and Heuristic Methods for Vehicle Routing Problem in Newspaper Distribution Supply Chain", *in proceedings of the 3rd International Conference on Industrial Engineering (ICIE 2015)*, 26 – 28 November 2015, Surat, pp. 13-18.**
3. **S unil V. Gawade, Milind Sakhardande and Rajesh S. Prabhu Gaonkar, "Vehicle Routing in Dairy Supply Chain: A Case Study", *in proceedings of the 3rd International Conference on Industrial Engineering (ICIE 2015)*, 26 – 28 November 2015, Surat, pp. 19-25.**
4. **G autam Agastipurkar, Milind Sakhardande and Rajesh S. Prabhu Gaonkar, "Lead Time Evaluation in various Buyer Supplier Relationships", *in proceedings of the 3rd International Conference on Industrial Engineering (ICIE 2015)*, 26 – 28 November 2015, Surat, pp. 117-121.**
5. **J ateen Shet Shirodkar and Akshay Nigalye, "Neural Network approach for predicting Academic Performance of Engineering Students", *in proceedings of the 3rd International Conference on Industrial Engineering (ICIE 2015)*, 26 – 28 November 2015, Surat, pp. 613-624.**
6. **R ajesh S. Prabhu Gaonkar, M.V. Verlekar, "Dynamic Fault Tree of Power System in Chemical Plant", *in proceedings of the 3rd International Conference on Industrial Engineering (ICIE 2015)*, 26 – 28 November 2015, Surat, pp. 1294-1299.**
7. **Raghavendra D. Naik & Kiran D. Mali, "Effect of Stiffness and Damping on Technical Stability of a Oscillator with Delay and Fractional Damping", *12th International Conference on Vibration Problems*, December 2015, IIT-Guwahati.**

International Journal Paper

1. **Subramanya R Prabhu, Arunkumar Shettigar, Karthik Rao M, Akshay Nigalye, Mervin A Herbert, Shrikantha S Rao, "Effect of Process Parameters on Tensile Strength of Friction Stir Welded Al-Cu-Mg-Si-SiC_p Composite", *International Journal of Biosciences, Agriculture and Technology (IJRBAT)*, Vol.II(7), 5-10.**

Field Visit to Crompton Greaves Limited, Bethoda

- **Report by Akash Kulkarni, T.E. Mech.**

The Third Year Mechanical Engineering students were taken to the Bethoda facility of Crompton Greaves Pvt. Ltd on 24th August, 2015. The students were accompanied by Dr. Suraj Rane, Professor in Mechanical Engineering. This factory primarily deals in assembly and distribution of ceiling fans. Some of the parts needed to complete the assembly are manufactured in-house. The rest are outsourced through other facilities of the company and well as third party vendors. The company caters to Indian market, while also manufacturing fans to be exported to countries like Sri Lanka, Malaysia and Bangladesh etc. The field visit started with the students being shown the various Quality Control (QC) checks being performed on the incoming components on a sampling basis. Even a basic component such as fan blade is checked extensively against parameters like angle, lift and weight.

The students were next introduced to the assembly and QC of stator, an important electrical component. They were explained about the various modes of failure of stator such as open circuit (OC), flash, surge (resistance) etc. The stator is finally coated with lacquer to protect it from corrosion before it is ready for assembly. Students were then taken to the storage area where all the incoming

components were stored and maintained after relevant QC checks prior to final assembly. The assembly line being partially automated was optimized to provide sync between man and machine. It consisted of various machines such as grinding assemblies which grind the shafts and other components such as stator to required design specifications using checking units such as comparators. The assembled fans are then subjected to final inspection before being packaged.

The final stop in this guided tour was the manufacturing unit of this facility. The students were shown processes such as laminating, die casting, forging, punching etc. The field visit was concluded with the students being informed about the company's objective of achieving Six Sigma performance levels. The company remains committed to achieve this goal despite having to manufacture a fan in mere 12.8 seconds. In order to achieve these goals, quality workers are deployed in each and every section of the facility. The quality engineers undergo certification courses in various Six Sigma programs

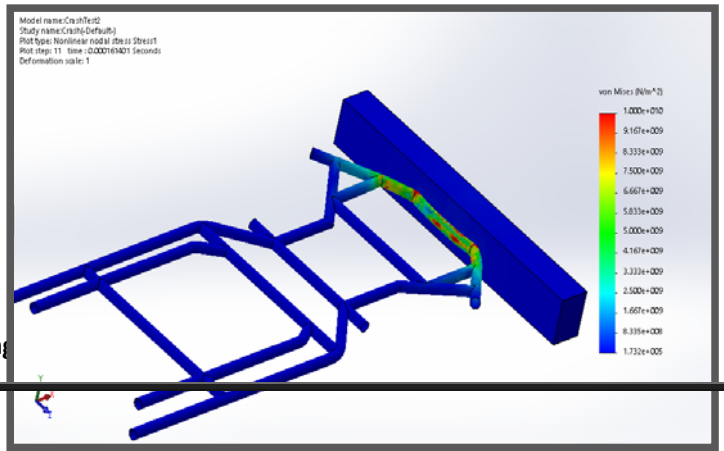
Go Kart Design Challenge 2015

such as Black Belt, Green Belt etc. in Pune. This field visit took a total of 3 hours, which were utilized to the fullest. The students were benefitted immensely as they could learn about various manufacturing and quality control processes employed in a large facility such as this. The students were guided inside the facility by executives of Crompton Greaves, Mr. Praveer Kamat and Mr. Vijay Raikar.

- Report by Mangesh Sardessai, B.E. Mech.

25 students from third and final year Mechanical Engineering of Goa College of Engineering, participated in "Go Kart Design Challenge 2015" (GKDC), organized by "Indian Society of New Era Engineers" (ISNEE). The Pre final round was held on 22nd and 23rd August at Indore. The GEC team qualified with an all India rank of 18, and it was the only team to be selected from Goa. 180 teams had participated at the pre final including some prestigious institutions such as IITs, NITs, and regional engineering colleges, of which only 80 have been selected for the next round.

The judges were impressed with the presentation and details considered in the design, and were particularly pleased with the simulations and analysis done in Solid Works. The team will strive to put up a good

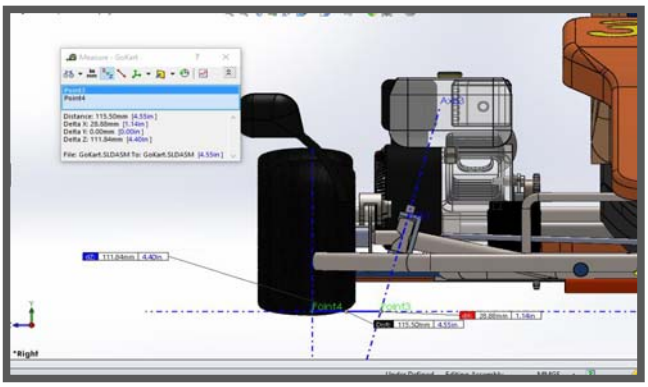


performance at the final round to be held at Greater Noida in February 2016.

Front impact testing was done on the frame using Solid Works Non-Linear Dynamic Simulation. It was tested at an impact velocity of 60km/hr., the designed top speed of the kart. The deceleration experienced by the driver was under the safe limit due to the frame deforming and absorbing the energy as designed.

The resonating frequency of the frame was also found using SolidWorks simulation and necessary actions were taken to avoid high amplitude vibrations. Isolators were used between the frame and the engine to dampen the vibrations and reduce force transmission.

Ackerman Percentage Achieved in design = 108%



Steering Geometry: Four-bar Pin Inversion

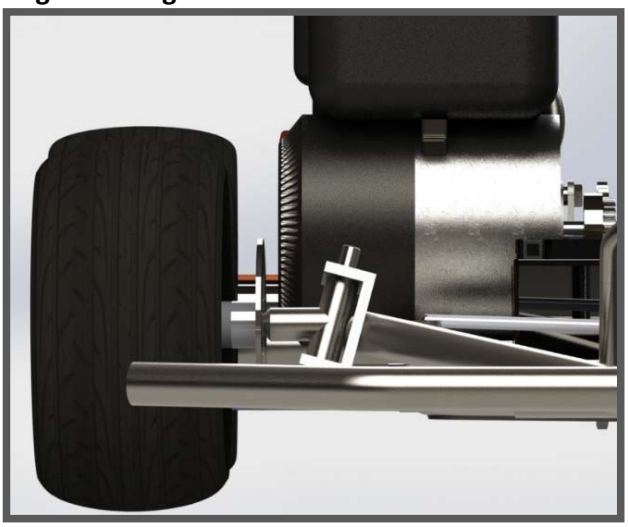
Ackerman Angle: 25°

Steering Axis Inclination: 15 °

Castor Angle: 12 °

Scrub Radius: 116mm

The combination of castor angle and steering axis inclination provided has two effects on the handling characteristics of the kart. First, it provides a high steering return force which makes the kart very stable at high speeds. Secondly, it helps the kart during turning. A kart has a solid rear axle and lacks differential. This induces a lot of understeer and lack of grip during sharp turns. Due to the Caster angle, the inside front tyre goes below its datum line and lifts the chassis up on the inside. This reduces the force on the inside rear tyre allowing it to slip during turns. The steering axis inclination also prevents the outside tyre from going below the datum line and nullifying the effect of the inside tyre unloading during the turns.

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Visit to IIIE Headquarters

On 11th July 2015, Dr. Rajesh Prabhu Gaonkar and Dr. Suraj Rane paid courtesy call on the Headquarters of IIIE at Belapur, Navi Mumbai. They met Cmdr. Bhandarkar who was glad enough to show them the new premises of IIIE headquarters. Cmdr. Bhandarkar detailed out how the new premises came into existence. He revealed his vision for IIIE and more particularly for Goa Chapter.

Talk on "Ethics and Motivation"

- Report by Pratik Joshi, S.E. Mech.

Shri Dilip Betkekar, a renowned speaker was invited to deliver a talk on the topic 'Ethics and Motivation' to the S.E. Mechanical students on 19th August 2015. The students appreciated the talk as they found it to be interesting and truly motivational. The programme was compeered by Pratik Joshi, S.E. Mechanical, whereas Amey Shirodkar, proposed the vote of thanks. The event was coordinated by Prof. Gajesh Usgaonkar.

Final Year Project Exhibition 2014-2015

- Report by Tejas Garge

Exhibition of projects of final year students of B.E. Mechanical was held on 14th July 2015 at the main building of the college. The exhibition was held with the aim of enlightening the current final year, third year, second year and fresher students. The exhibition gave a platform for the final year students to display the hard work they had done and to explain their ideas to students and faculties.

The Principal of college, Dr. V. N. Shet graced the event with his presence along with HOD of Mechanical Department, Dr. Rajesh Prabhu Gaonkar and other faculty of Mechanical Engineering Department. All the groups explained their project working with presentations and videos. Workings of fabricated models were also shown. Principal appreciated the effort and ideas of students and also gave some suggestions for improvement.

The various projects on display were:-

1. Automatic wall painting machine.
2. Internal pipe inspection robot.
3. Non-powered above knee prosthetic limb.
4. Intelligent reverse braking system.
5. Mango pulp extraction machine.
6. Stair climbing wheel chair unit.
7. Bio waste briquetting machine.
8. Autonomous vehicle.
9. Areca nut leaf plate making machine.
10. Betel nut de-husking machine.
11. Flow visualization tunnel construction.

The exhibition was open from 10 a.m. to 4 p.m. in the evening. During this time students and faculty members of all the departments visited the exhibition. There was a healthy interaction with the students, especially the first year students. Also the faculty members

Mec , GEC

Talk on "Higher Education Opportunities in Europe"

gave their suggestions and appreciated the project groups.

Report by Rajjat Karekar, B.E. Mech

Mechanical Engineering Students Association organized a talk on "Higher education opportunities in Europe". The talk was held on 25th August in the Mining department seminar hall. The function started with the introduction of the guest speaker and GEC alumni Mr. William Gracias (B.E., M.Tech) by General Secretary of MESA, Mr. Rajjat Karekar.

In his talk he shared information about the higher education opportunities in Europe. He also mentioned about the various scholarships available for higher studies in various universities in different parts of Europe. He made the audience aware of how intercollegiate transfers can be taken up. He also made clear the differences between education in Europe and in America.

The talk was organized especially for the Final year Mechanical Engineering students so that they could be made aware of the higher education opportunities as they had reached a pivotal point in their career. Mr. Gracias was presented a memento by the MESA staff advisor Prof. Milind Sakhardande. The function ended with vote of thanks presented by Mr. Mangesh Sardessai.

Seminar on Advanced Mechatronics System

-Report by Rajjat Karekar (B.E., Mech)

Mechanical Engineering Students Association organized a seminar on "Advanced Mechatronics System". The seminar was held on 4th September in the Library seminar hall as a part of National Skill Development Corporation's (NSDC) training program by "Prolific Systems & Technologies Pvt Ltd".
Mr Suhas Gadekar (HOD MECH), senior faculty in Knowledge Management in Prolific was speaker for the occasion. The seminar began at 11.00am. The gathering was welcomed by Mr. Ishwar Madkaikar who also introduced the guest speaker. Mr. Gadekar began the seminar by sharing his personal experience of working in industries and he said that practical's on theory is not done much in college's in India. He also said that for students to be in industry, they should know the basic working and understanding of the hardware used in industries, which they were able to provide at Prolific System.

He told students about the various facilities provided by his company by organising various workshops. The company also gives advanced hardware diploma degree courses of 3-4 month duration for students of Mechanical Engineering, Electrical & Electronics Engineering and Electrical

Engineering students in Pune. Students of TE and BE were present for the seminar. Mr Tejas Pether (TE Mech) then gave the vote of thanks, and Mr Rajjat Karekar presented a small memento on behalf of

TEQIP - II Short Term Training Programme on "Modelling and Simulation"

the Mechanical Engineering Department.

The TEQIP - II Short Term Training Programme on "Modelling and Simulation" was held from 7th -18th December 2015 at Goa College of Engineering (GEC). This was organized by Department of Mechanical Engineering, Goa College of Engineering Farmagudi, Ponda, Goa in association with Walchand College of Engineering (WCE), Sangli, Maharashtra.

Dr. G. V. Parishwad (Director, WCE), Shri Vivek Kamat (DTE, Goa State), Dr. V. N. Shet (Principal GEC), Dr. Uday Dabade (Professor, WCE) and Dr. Rajesh Prabhu Gaonkar (Professor, GEC) were present for the inaugural function. Dr. Rajesh Prabhu Gaonkar welcomed the gathering and presented overview of the programme. Dr. V. N. Shet stressed on the need for cooperation between two important institutes WCE & GEC. Shri Vivek Kamat highlighted the need of modelling and simulation in the present day scenario. Dr. G. V. Parishwad extended the cooperation in joint ventures like continuing education programmes, faculty sharing, joint conference organization, testing, consultancy etc.. Dr. Uday Dabade proposed vote of thanks and Shri Milind Sakhardande compeered the function.

The first session was conducted by Dr. Vinay Shirodkar on basics of modelling, especially deterministic type of mathematical modelling. Dr. Akshay Nigalye presented on how to model the systems in continuous domain. Dr. Sural Rane covered "Probability concepts" in depth with focus on various probability distributions. "Basics of MATLAB" and "Programming in MATLAB" were covered by Dr. Anant Naik with lots of hands-on. He also conducted a day long marathon session on "Simulink in MATLAB" and showed how to simulate continuous systems.

Basic concepts of simulation and simulation programming in MATLAB was covered by Dr. Rajesh S. Prabhu Gaonkar. He was assisted by Mr. Pratik Sawardekar and Mr. Rylan Caldeira. Dr. V. Mariappan, in his unique style, talked on "Inferential Statistics" and "Statistical Analysis for Randomness", with hands-on exercises in MS-Excel in later part of his session. Dr. Michael Sony presented a case study in Electrical Engineering domain and Mr. Jateen Shirodkar presented a case using Neural Network.

Dr. Vinay Shirodkar presented basics of "Queueing Theory" which was followed by sessions on GPSS software conducted by Mr. Milind Sakhardande, Mr. Rylan Caldeira and Dr. Rajesh S. Prabhu Gaonkar. Dr. Govind Kunkoliekar engaged the participants on interesting aspects of modelling and simulation with his unique humorous style.

Dr. Uday Dabade and Mr. Sunil Karidkar from WCE presented on "Multiple Response Variable Optimization using GRA and Research in Micromachining". Two more case studies, one by Dr. B. S. Gawali on "Simulation of Thermal Storage Systems" and the other by Dr. S. U. Sapkal on "Heuristics for Manufacturing Scheduling" were also presented. Participants enjoyed a session on "Research Methodology" by Mr. Vijay Borges. Two sessions on "Simulation with R" were conducted by Mr. Ramrao

Wagh from Goa University. The industry participant's requirement on "Solid Modeling and Animation" was met by Shri Raunak Kamat. A test was also conducted for the participants on 17/12/2015.

Total number of participants were 36 (31 from academics & 5 from industry) and resource persons were about 20. The cultural night with dinner was held on 17/12/2015.

Valedictory function was held on the last day i.e. on 18/12/2015. Shri N. M. Shah (President, IIIE, Baroda Chapter) was the Chief Guest. Shri Vivek Kamat (DTE, Goa State), Dr. Uday Dabade & Dr. Rajesh Prabhu Gaonkar (coordinators) were present on the dais. Dr. Rajesh Prabhu Gaonkar welcomed the gathering and presented the TEQIP programme report. Shri Vivek Kamat (DTE, Goa State) congratulated the organizers for successfully conducting the programme. Chief Guest Shri N. M. Shah enthralled the audience with his humorous style and he stressed upon the need of such programmes and congratulated the participants for successfully undergoing this programme. Dignitaries presented the certificates to the participants and mementoes to the resource persons. Dr. Suraj Rane proposed vote of thanks and Shri Milind Sakhardande compeered the function.


TEQIP-II
"Modelling and Simulation"
MATLAB
Model Adequacy: A Case of Validation of Simulation Model with Mathematical Model
by
Michael Sony
Goa Electricity Department
TEQIP-II
"Modelling and Simulation"


Short Term Training Programme
on
"Modelling and Simulation"
TEQIP-II
Sponsored
Short Term Training Programme
on
"Modelling and Simulation"

Goa State Meritorious Technical Teacher Award Presented to Dr. Rajesh Suresh Prabhu Gaonkar

Dr. Rajesh Suresh Prabhu Gaonkar has become the first recipient of Goa State Award for Meritorious Teacher in Technical Education for the year 2015. This was presented to him at the hands of Honorable Chief Minister of Goa Shri Laxmikant Parsekar, at the liberation day state level function held on 19th December 2015. This is awarded in public recognition of his valuable services to the community as a teacher of outstanding merit.

राजेश प्रभुगावकर यांना तांत्रिक शिक्षक पुरस्कार

फोंडा, ता. २७ (प्रतिनिधी) : फर्मागुडी येथील गोवा अभियांत्रिकी महाविद्यालयाचे मेकॅनिकल विभागाचे प्रमुख डॉ. राजेश प्रभुगावकर यांना राज्य सरकारचा तांत्रिक शिक्षक पुरस्कार प्राप्त झाला. ता. १९ रोजी गोवा मुक्तिदिन कार्यक्रमात मुख्यमंत्री लक्ष्मीकांत पार्सेकर यांच्या हस्ते त्यांना हा पुरस्कार प्रदान करण्यात आला.

तांत्रिक शिक्षणासाठीच्या या पुरस्कारांचे डॉ. प्रभुगावकर पहिले मानकरी ठरले आहेत. शिक्षणाच्या माध्यमातून समाजासाठी उल्लेखनीय कार्य केलेल्यांना हा पुरस्कार देण्यात येतो. मूळ माशे - काणकोण येथील डॉ. प्रभुगावकर यांच्या शिक्षण क्षेत्रातील उल्लेखनीय कार्याचा हा गौरव आहे. त्यांनी मुंबई आयआयटीमधून पीएचडी संपादन केली असून सिंगापूर येथील नॅशनल युनिव्हर्सिटीचे ते 'पोस्ट डॉक्टरल रिसर्च फेलो' आहेत. ते 'इंटरनॅशनल जर्नल ऑफ सिस्टिम अॅश्युअरन्स इंजिनिअरिंग अँड मॅनेजमेंट' या मासिकाचे सहयोगी संपादक आहेत.

CONGRATULATIONS

Dr. Rajesh Suresh Prabhu Gaonkar

Ph.D. (IIT Bombay), PDF (NUS, Singapore)
Professor & Head, Mechanical Engg. Dept.
Goa College of Engineering
Farmagudi, Ponda - Goa

First awardee of Goa State Award for Meritorious Teacher in Technical Education for the year 2015

With Best Wishes from:

Prof. D. V. Shirodkar, Flt. Lt. B. R. Kulkarni, Dr. Akshay Nigalye, Prof. Mahesh Dhawalikar, Prof. Gajesh G. S. Usgaonkar, Dr. Shridhar Mhalsekar, Dr. Vinay Shirodkar, Prof. Milind Sakhardande, Prof. Vivek Belokar, Prof. B. S. Manohar, Dr. Suraj Rane, Prof. Mahesh Caisucar, Dr. Raghavendra Naik & Prof. Harichandra Chandekar

Dr. Rajesh S. Prabhu Gaonkar is presently, Professor and Head of Mechanical Engineering Department at Goa College of Engineering (GEC), Farmagudi and Dean, Faculty of Engineering at Goa University. He is Ph.D. from I.I.T. Bombay and a Post Doctoral Research Fellow of National University of Singapore. He has published over 50 research papers in various International Conferences and Journals. He is author of a book on "Fuzzy Reliability -- Concepts and Applications" He is an Associate Editor of the "International Journal of System Assurance Engineering and Management" (a quarterly Journal published by SPRINGER). He is on paper reviewer panels of around 10 international journals. He was involved in organization of 06 international conferences in India in various capacities.

The prestigious fellowship of Indian Institution of Industrial Engineering (IIIE) was conferred on him during the 56th National Convention of IIIE held at Visakhapatnam (Vizag) in 2014 for his immense contribution to the field of Industrial Engineering in the state of Goa.

Mesa Council Installation 2015-16

-Report by Nihar Madkaikar (Technical Advisor, Mesa)

The Mechanical Engineering Students Association (MESA) of Goa College of Engineering, Farmagudi, Ponda, Goa; inducted their students Council for the academic year 2015-2016 on 8th September 2015 at the function held at ETC Department Seminar Hall.

Mr. Erwin Paes, Director, Execution and Delivery, OptessaInc, Canada and also an alumnus of our college was the chief guest for the installation ceremony. Also present on the dais were Dr. V N Shet, Principal, Goa College of Engineering, Dr. Rajesh Prabhu Gaonkar, Head of Mechanical Engineering Department and Prof. Milind Sakhardande, MESA Faculty Advisor.

The welcome note was given by the chairman of the council Mr Nikhil Kamat, following which our HOD Dr. Rajesh Prabhu Gaonkar also said a few words on the history of MESA and how it had grown and matured since its inception in 1992. He also briefed about the achievements, events organized and industrial visits in the last academic year by the association. He motivated the students to be a helping hand to society and take the Mechanical Engineering Students Social Educational and Green Initiative (MESSERGI) ahead. Dr. V N Shet, than lauded MESA for MESSERGI and its other achievements over the past many years.

Mr. Erwin Paes, the chief guest, shared his words of wisdom highlighting on the key points the students need to achieve success. He spoke about his experiences in industry and took us on a nostalgic trip through his time in college.

The speech was followed by the oath taking ceremony by the new MESA council. The NIRZER magazine and the new Mesa T-shirts designed by the students were also unveiled. The ceremony ended with the distribution of mementos and concluded with the vote of thanks given by the General Secretary, Mr Rajjat Karekar. The inauguration ceremony was followed by various events like Robo Control, Robo Race, and Workshop on robotics and Quiz which were organized by the students.

AUTHORITY	NAME		Executives
Chairman	Nikhil Kamat, B.E.		Leslie Furtado, B.E.
General Secretary	Rajjat Karekar, B.E.		Govind Bhangle, B.E.
Secretary	Ashley Fernandes, B.E.		Sarvesh Bhide, B.E.
Treasurer	Ketan Betkekar, B.E.		Susim Singh, T.E.
Auditor	Mangesh Sardessai , B.E.		Pradosh Volvoikar, S.E.
Ladies Representative	Trupti Joshi , B.E.		Amey Verdekar, S.E.
Technical Advisor	Nihar Madkaikar , B.E.		Rushab Phadte, S.E.
Asst Technical Advisor	Sainand Sopte , B.E. Tejas Pethkar, T.E.		Rounak Amre, F.E.
Placement secretary	Sohan Pai Angle, B.E.		Omkar Rai, F.E.
Asst Placement secretary	Anthony D'silva, T.E.		Siddhart Panvelkar, F.E.
MESSERGI Advisor	Raju Gaonkar, B.E.		

A Point of view…… Nihar Madkaikar, B.E.(Mech)

We all know about the destruction that we are causing to environment. Yet we don't seem to be doing much about the same. I have noticed a major wastage that takes place in Goa College of Engineering that we can reduce. We as engineers can put technology to use to remove this wastage.

Every semester each student writes assignments/ term work on ruled bond Pages that are sold by the Engineering Corporative Society. Each assignment consists of minimum around 35 Pages. Assuming each student writes at least assignments for 4 Subjects (sometimes we write for more) we arrive to the figure that each student uses 35*4 = 140 pages per semester. 2200 students write assignments / term work each semester; hence we end up with 140*2200 = 308000 pages. Each A4 size page weighs 4 grams hence the total weight of paper comes to around 1.2 ton. Not to mention the paper files those are used. So we end up using easily around 1.4 ton of paper each Semester!

The paper is not the only thing being wasted; huge amount of energy goes in to manufacturing the paper and in printing the ruled lines on the paper. Large numbers of trees are cut down to manufacture this paper. Chlorine and chlorine based compounds are used in manufacture of this paper.Paper to manufacture (from standing timber) consumes around 13900 watt hrs per Kg. With an estimated 1.4 tons of paper we have 19460 KW hrs of energy used for manufacturing the paper required for one semester. We can save 20 MW of energy per semester. 20 MW energy is enough to power more than 50 houses in rural India for at least one year that is just the energy used in one semester.

Are these assignments really required or can they be replaced by more productive activities?

Most of the students just copy down the assignments from previous year assignments or their friends and we hardly make any sense of anything that we have written. Frankly these assignments are being submitted to fulfill certain accreditation society norms and nothing else. After the term the assignments lie in corners of labs and offices eating up precious space. Once inspections are done, these files are burned again contributing harmfully to environmental destruction. (they can be recycled but again energy would be used up for recycling).

What we can do instead?

We can have E-assignments/ presentations rather than making students write down on paper. Students can be made to write short articles for each subject, for which they would have to research about the subject matter. Students have access to laptops / computers these days and it wouldn't be a problem. The college computer labs can be made available for the same. We can have a web portal

developed where students can submit their articles/ assignments. Good meaningful articles can be

TANDAV -09

published on the web through the same portal, bringing exposure to the student and our college.

-Report by Rajjat Karekar (General Secretary, Mesa)

The 9th Edition of "TANDAV" which is a inter department cultural /sport event organized by the students council of the college was held in October this year.

All the students of the Mechanical Department helped together to put up an excellent performance at the Inter-departmental Fest, thus bringing back the trophy to the Mechanical Engineering Department for a 3rd time and after a wait of 3 years. Co-ordinated by the MESA council, the students worked together as a team to win series of events that spanned across talents such as music, dance, art and sports.

The fest started with sports events which included football, table tennis, volleyball, carrom, badminton, track events etc. Students of the department known to be good at sports proved it right winning almost all the events. At the end of the sports events, the department was at the top of the score sheet.

The students ensured that the trophy was won by putting up great show at the cultural events which included mime, street play, dance, singing, Mr. & Miss Engico, unplugged, junkyard beats and fashion show.

The principal and department staff congratulated the participants and the winners. The trophy was handed over by the principal Dr. V N Shet, which was followed by a photo shoot by the students.


TANDAV-09 WINNERS!!...

Team Phoenix – Glory in Ashes

-Report by Sarvesh Shenai (TE, Mech)

TEAM PHOENIX is an established team of students from various engineering colleges across Goa who are deeply interested in the field of ROBOTICS. Starting with its Combat Robotics Section, the team futher expanded to the ElectroPhoenix Section and the Design & Web Development Section.The team laid its foundation with its core GEC members being Devendra Bhat, Saurabh Verenkar, Anay Bhagat, Akash Kulkarni and Sarvesh Shenai.

Team Phoenix built its first 'com-bot' viz: "SUAREZ" which made its debut at QUARK 2015 (BITS PILANI-GOA CAMPUS) and won 2nd place. "ALPHA-Q" the second 'com-bot' was built soon after which along with SUAREZ participated at "RIT TECH TWISTER 2015". Both achieved podium finishes with SUAREZ (1st) and ALPHA (3rd). More success followed soon after with a 2nd place at "TORQUE 2015" in Goa College of Engineering in a hard fought final and a 1st place at "SPARX 2015" in Goa College of Engineering. The final tournament of the season also ended in a victory for Team Phoenix with SUAREZ clinching the 1st place at the "AITD Technical Event".

After a season of immense success and with a podium finish at every event, the team began its expansion phase and expanded into its ElectroPhoenix Section which included Dattaprasad Ekavade and Raghavendra Puranik. The expansion also included juniors Devansh Cholera, Warren D Sa, Akash Patravali and Shubham Gaonkar being inducted into the team. The "Design and Web Development" section has also been an integral part of the expansion phase with Shawn Fernandes heading the section.

In its second season, a poweful wireless 30 kg 'com-bot' was built viz: SUAREZ 2.0 which is one of Goa's first wireless com-bots. SUAREZ 2.0 participated at "TECHYON 2015" at PCCE, Verna and came 2nd. Team Phoenix not only participated in Goa but also outside Goa. It participated at "VJTI, Bombay" in the 15kg robo sumo competition with its wireless bot "TORR".

TEAM PHOENIX has delivered as many as 5 robotics workshops to school and college going students under "Inventrom Robotics-Panjim" and also delivered an interactive robo workshop at BITS Pilani, Goa Campus. The current plans of the team are building a 120lb "com-bot" and partcipating in various competitions across India. The team further aims to build on its success and make huge advances in the field of robotics in the future.

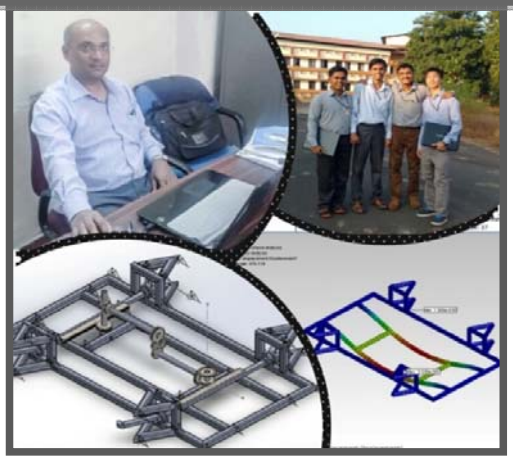
Two-Week ISTE STTP on "Technical Communication"

The two-week ISTE short term training programme on "Technical Communication" was conducted by the e-Outreach project of IIT Bombay, from 08th October to 5th December 2015, under the National Mission on Education through ICT (MHRD, Govt. of India). Goa College of Engineering, Farmagudi was one of the remote centers across the country. Dr. Rajesh Prabhu Gaonkar, HOD of Mechanical Department and center coordinator, actively coordinated the STTP. The STTP included online activity from 08th October to 11th November 2015 equivalent to one week of STTP activity, and face-to-face participation at a Remote Center from 30th November to 5th December 2015. Prof Milind Sakhardande, Prof Mahesh Caisucar and Prof Harichandra Chandekar participated in the two-week ISTE STTP programme. A total of 21 participants from other departments in GEC and various other engineering colleges in Goa also participated.

Two-Week ISTE STTP on "Engineering Physics"

A two week ISTE short Term Training programme (STTP) on "Engineering Physics" was conducted at Goa College of Engineering from 8th to 18th December 2015. The Programme was conducted under National Mission on Education through ICT, MHRD, Govt. of India. The host institute was Indian Institute of Technology Bombay. Goa College of Engineering was one of the remote centres (RC ID- 1058) for this program and course was streamed online at GEC with IITB faculty delivering lectures from IIT Bombay. Teachers teaching Physics in Engineering Colleges and Polytechnics attended this training programme. The programme was coordinated by Dr. Akshay Nigalye, Professor, Mechanical Engineering Department. Prof Milind Sakhardande was the remote center coordinator for the programme.

Sponsored Project: Configurations and Applications of Four Wheel Steering Mechanism



- **Report by Dusu Genda, B.E. Mech**

Group Members : Dusu Genda, Mainak Ash,
Ramanand Chari, Shubham Bhartu
Project Guide : Dr. Vinay Shirodkar

Abstract: Today's cars normally have two wheel steering mechanism which has some inherent drawbacks under varying driving and terrain conditions. This work addresses the concerns regarding two wheel steering mechanism and proposes a four wheel steering mechanism.

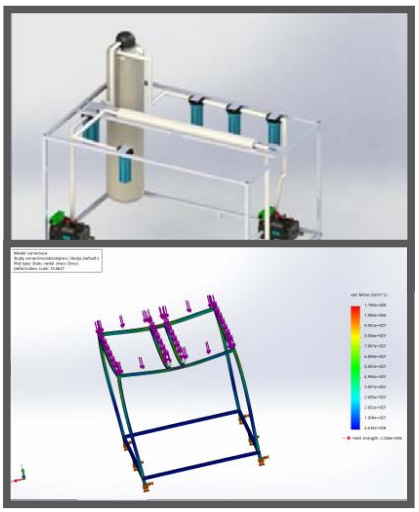
Four-wheel steering is a serious effort on the part of automotive design engineers to provide near-neutral steering having reduced turning radius. The main aim of this project is to steer the rear wheels along with the front wheels. This is achieved through series of gear chains and drive mechanism that transmits torque as well as steers the wheels. The proposed four wheel steering mechanism helps in low speed cornering, vehicle parking in compact areas and driving in city traffic.

Department of Science, Technology and Environment, Saligao, Goa has selected and approved the project for sponsorship. The sponsorship amount is Rs. 50,400/-.

Sponsored Project: Ocean Water Purification using Solar Energy

- **Report by Aditya Rivonkar, B.E. Mech**

Group Members: Aditya Rivonkar , Mangesh Sardessai, Kumar Surajdeo Singh, Rohan Manjrekar.
Project Guide: Dr. Suraj Rane



Abstract: Water covers 75% of the earth of which 97% is in the oceans leaving a very small percentage of pure and drinkable water. The world today is facing a major problem of drinkable water, due to improper management of water resources and pollution. Almost 80% of diseases caused in the world are due to unhygienic drinking water. Since there is abundant water available in the oceans which cannot be used directly for drinking, we aim to design and fabricate ocean water purifier which will run on natural energy in the form of sun which cuts energy cost and also solar energy is widespread throughout the country, enabling the project to be implemented in regions with scarcity of electricity.

The prototype will accept raw water and purify to make it potable by removing dissolved salts and other impurities of ocean. It will also be able to purify river water by taking care of permissible organic content and also water sources like lakes, rain water. The water will pass through pretreatment processes and then undergo reverse osmosis followed by post treatment. The end result will be potable water. The prototype will be able to produce water at the rate of 300 GPD. The project has received a sponsorship amount of Rs. 1,30,000/- from Department of Science, Technology and Environment, Goa.

3rd International Conference on Industrial Engineering (ICIE-2015)

Shri Vivek Kamat, Director, Directorate of Technical Education, Dr. Rajesh Prabhu Gaonkar and Dr. Suraj Rane along with some of the M.E. Industrial Engineering students attended the 3rd International Conference on Industrial Engineering (ICIE-2015), which was organised by IIIE, NHQ Mumbai and held at SVNIT, Surat from 26th to 28th November, 2015. Dr. Rajesh Prabhu Gaonkar was a member of the Advisory Committee and Technical Committee. He also chaired one of the session.

Dr. Rajesh Prabhu Gaonkar was the Chief Guest and inaugurated the Diwali product exhibition organized by Gujarati Samaj School for Specially Abled Children at Margao, Goa.

Dr. Rajesh Prabhu Gaonkar was the Chief Guest at Gujarati Samaj School

MESSERGI Activity: Exhibition by Gujarati Samaj Special School

- **Report by Nihar Madkaikar, Technical Advisor, MESA**

MESA, under the banner of MESSERGI (Mechanical Engineering Students Social, Educational Responsibility and Green Initiative) organized an exhibition cum sale for "Gujarati Samaj Educational Trust, Special School, Margao, Goa" in the college premises.

Various Diwali products were exhibited at this exhibition; all the products were made by the students of the special school. There was a very good response to the exhibition with a large number of students

and staff taking interest in their work and buying the products. The students of BE Mechanical actively participated in organizing the exhibition.

The students were grateful to Mr. Prashant of the Gujarati Samaj trust for helping them in coordinating the activities. The students also thanked the Principal and Head of Mechanical Engineering Department for making it possible to conduct such activities in the college.

MESSERGI Activity: Solving difficulty of Students in Balkalyan Ashram

MESSERGI Activity: Book Donation Drive at Valpoi

- Report by Raju Gaonkar, Messergi Advisor, MESA

Students of final year Mechanical Engineering held a book donation drive under the banner of MESSERGI (Mechanical Engineering Students Social, Education Responsibility and Green Initiative). MESA collected and donated books to government primary schools in and around Valpoi. The schools in rural parts of Goa are still deprived of basic access to good reading material and other amenities. An effort was made to provide variety of books to

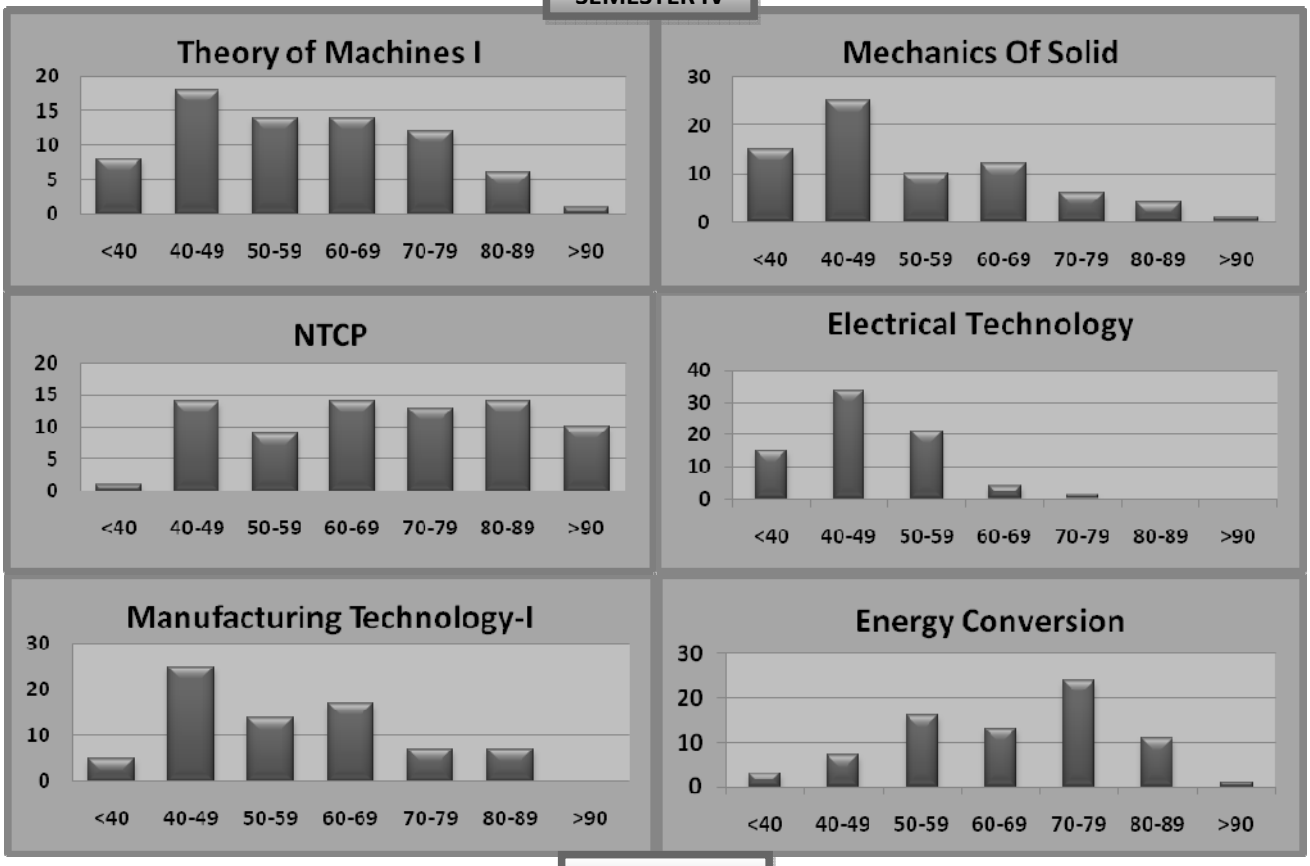
these primary school students, ranging from story books to biographies. In total four schools were covered with total student strengths of 30, 11, 10 and 09 students from standard 1st to 4th.

The following students helped with the distribution of the books: Raju Gaonkar (Messergi advisor), Ketan Kamat Betkekar, Govind Bhangle, Trupti Joshi, Kumar Surajdeo Singh and Nihar Madkaiker while Sahil Naik, Vishvesh Gawde, Rajjat Karekar, Ramanand Chari and Mangesh Sardessai helped in sorting the books. The students were thankful to Mrs. Bhavna Betkekar (Govt. Primary School, Valpoi) for her help in contacting the schools in Valpoi. Many more books have been (and will be) collected and distributed to such schools around Goa over the coming weeks.

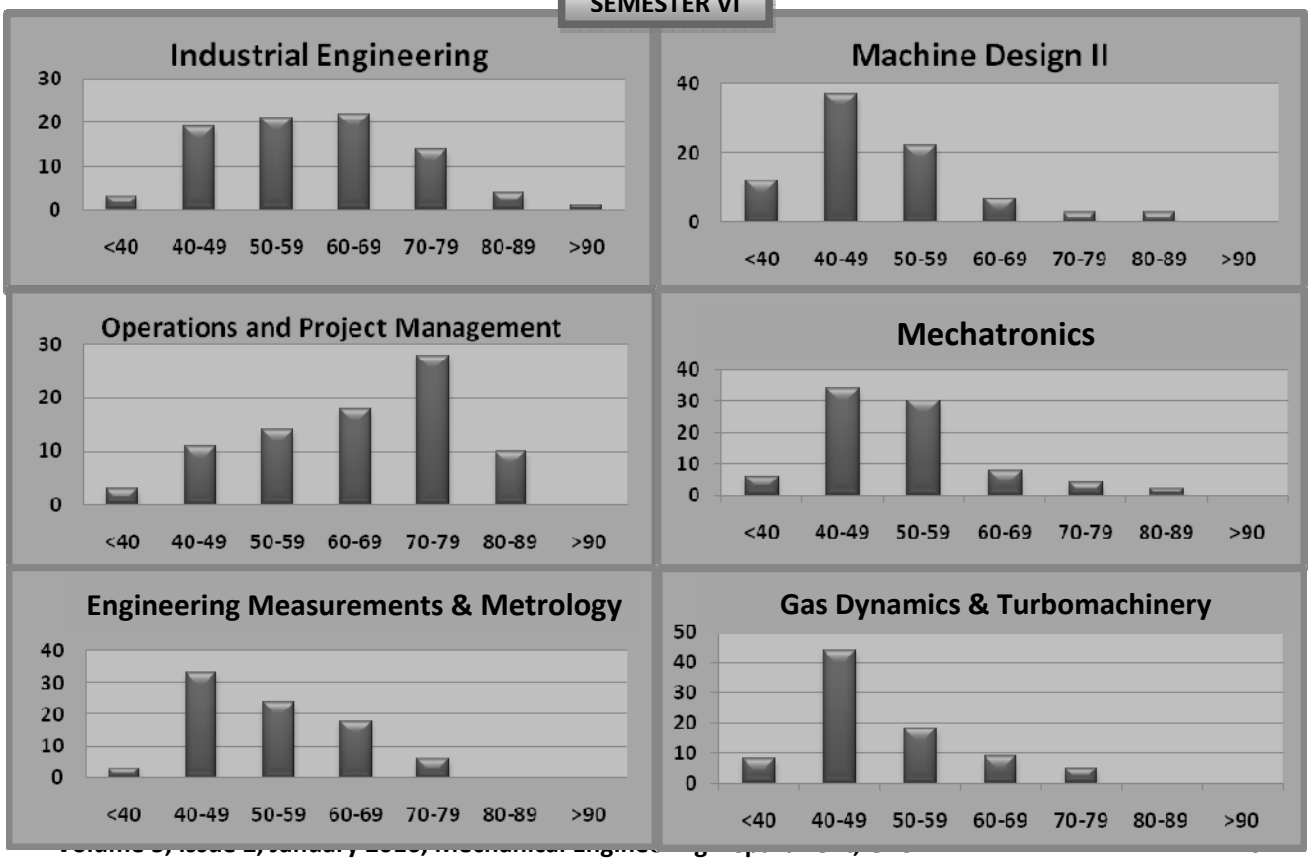
Tree Plantation by Mechanical Faculty during Van Mohatsav 2015

Result Analysis May / June 2015 (Number of student's v/s Range of marks)

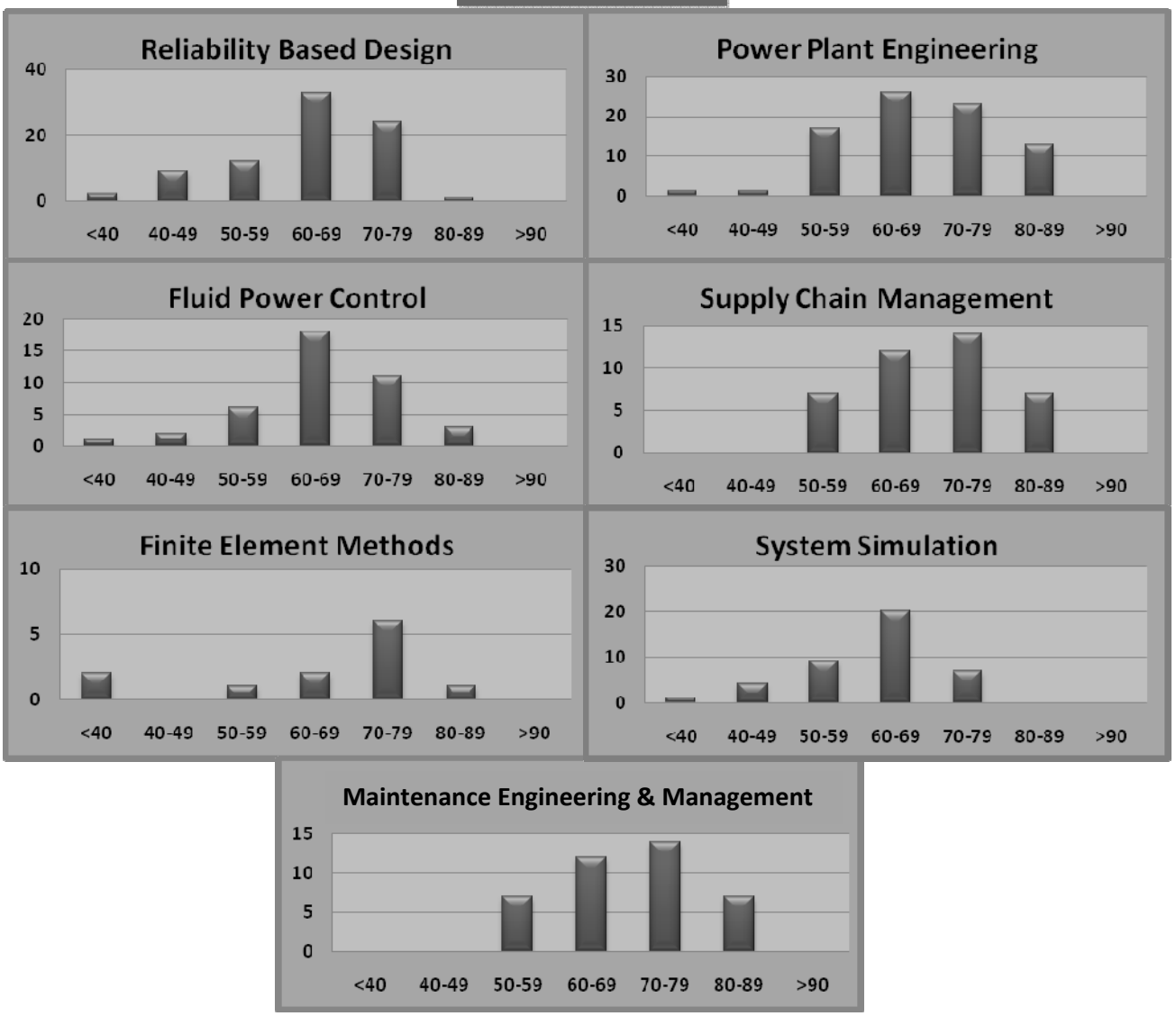
SEMESTER IV



SEMESTER VI

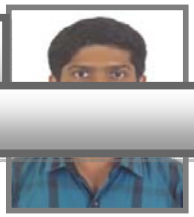


SEMESTER VIII



IBM-GBS (Global Business Services)	INFOSYS	TASL (Tata Advanced System Limited)	IBM-Technical Support	Godrej & Boyce
• Mainak Ash • Chetan Bandodkar • Brendon Mascarenhas • Surjdeo Singh • Sarvesh Sail • Naquibalam	• Sohan Pai Angle • Chetan Bandodkar • Shubham Bhartu • Ketan Betkekar • Brendon Mascarenhas • Ashley Fernandes	• Sarvesh Sail • Rutwik Jadhav	• Brendon D'Sousa	• Tejas Barve • Sohan Pai Angle • Brendon D'sousa

Sheikh • Sohan Pai Angle				



Sketching……

Placement Data – VIIth Semester

Vimal U Mangeshkar, student of Final Year Mechanical Engineering, is an artist par excellence. He has won accolades for his sketches. Some of his sketches:

Koenigsegg Regera's Electric Valve Train

- Article by Tejas Petker, T.E. Mech.

Internal combustion engine have been used since 1870s to power most of the vehicles. The thermodynamic cycles used in them require the control of flowing gases. This is achieved with the use of valve operated by a cam driven by the crankshaft. The cam lifts the valve at predesignatèd position of the piston. The camshaft is thus designed to provide optimum efficiency at a certain rpm of the engine. The vehicles which are designed for a very high efficiency do not provide a good performance at high rpm. The power produced by the engine drops rapidly due to drop in volumetric efficiency. On the other hand the engines designed for a good performance have poor efficiency at low rpms. Manufacturers have used many techniques to obtain a good balance between efficiency and performance. The major requirement is change in valve timing. VVT, VTVT, VTEC etc. denote the technologies used by different manufacturers to vary the valve timing at various rpm of the engine. These utilise the rotation of the camshaft with respect to the crank angle using complex electronics. Honda introduced a dual cam design to obtain a higher and longer valve lift on their cars. These enabled many of their engines to redline at 9000 rpm instead of normal 6500 rpm, leading to a higher power output.

Overall, since the 19th century, basic design of the valve train remained the same. Koenigsegg revealed their Regera concept. Koenigsegg is a Swedish automobile manufacturer that specialises in producing high performance hypercars. Their latest innovation is the Regera hybrid supercar. It has a direct drive transmission with no gear box to vary the ratios and 3 electric motors, 2 driving the rear wheels and the other acting as a generator and a starter for the engine.

The special thing about the 5 liter V8 engine is that it uses a fully electronic valve train with no mechanical link to the crankshaft. All the valves are controlled by solenoid rather than a camshaft. A normal camshaft has a curved profile, but the areas of partial lift are not efficient for the engine. A square cam profile which can be considered as an on/off switch is not physically possible. The electric valve actuators can achieve this and thus are highly efficient. The cam-less engine provides full flexibility to the ECU to control each valve individually. The valve timing is very easily controlled as required, thus providing the best efficiency possible at any rpm and since the Regera has a fixed ratio drive train, this is very important. On the other hand the valves can be used to shut off individual cylinders to improve mileage which cannot be obtained with a normal camshaft engine. This is a radical technology and is set to change the face of the auto industry. If applied to current engines without any other modifications, it can provide up to 30% more power and torque and up to 50% more efficiency. This means a normal hatchback with 20kmpl can give a mileage of 30kmpl. This is a huge improvement. Currently due to the

high development cost, these cars will be expensive, but it will become a standard feature like VVT after a few years.

Faculty Profile: Prof. D. V. Shirodkar

Prof. Digambar V. Shirodkar has been working as Associate Professor (Workshop) in Goa College of Engineering from 01-01-2006. He did his B. E. in Mechanical Engineering and M. E. in Industrial Engineering from Goa College of Engineering.

He has worked in the industry for around 3 years. After leaving M/S. Sesa Goa Ltd., he joined this college as Associate Lecturer in Mechanical Engineering on 05-10-1983. After working for more than 3 years, he was appointed as Assistant Workshop Superintendent on 10-12-1986. Later on, he became Workshop Superintendent on 14-02-2001 and he has been heading the Workshop Section till date. He has been shouldering the responsibility of discharging administrative / managerial works of Workshop Section apart from teaching. In the past, he has made efforts to upgrade the Workshop by purchasing machines like Surface Grinder, Centreless Grinder, Thickness Planner, Jig Saw, etc.

During the period of more than 32 years of his service in this College, he has engaged Theory/ Tutorial/Practical classes in many different under graduate subjects such as Engineering Drawing, Machine Drawing, Industrial Engineering, Manufacturing Technology-I, Manufacturing Technology-III, Operations Management, etc. He had also engaged post graduate classes in the subject of Work System Design for a period of 3 years. He has guided more than 60 final year projects. He has always encouraged the students in their studies and extended maximum co-operation to the students in fabrication of their projects and other items such as Go-karts, Robots, etc. which enabled the students to participate in inter- collegiate & national level competitions. He has also accompanied the students for industrial visits & long study tours within as well as outside Goa on many occasions.

He has attended many summer/ winter /refresher courses in G.E.C. as well as in different Colleges & Institutes outside Goa. He is also having some research papers to his credit. He is a life member of I.S.T.E. (Indian Society for Technical Education) and I.I.I.E. (Indian Institution of Industrial Engineering). He has been working as the Chairman of "Furniture Committee" w. e. f. 02/05/2006. He has worked as the member of Purchase Advisory Committee, Condemnation Committee and Canteen Committee for many years. He was also a member of Syllabus Revision Committee. He has rendered a lot of co-operation to the Stores Section in opening of quotations, tenders, etc.

He will be retiring on 30/06/2016 after serving this College for a period of 32 years, 9 months. May Almighty God bless him and his family with very good health.

Cultural Night @ TEQIP

A cultural night with dinner was held on 17/12/2015 for the participants and faculty of the TEQIP II Short Term Training Programme on "Modelling and Simulation".

Prof. Milind Sakhardande and Prof. Mahesh Caisucar have registered for PhD at Goa University. They have successfully cleared the entrance exam as part of Ph.D. requirement. They will be working under the guidance of Dr. Rajesh Prabhu Gaonkar, Professor and Head, Mechanical Engineering Department, GEC. Prof. Milind Sakhardande's area of research is Supply Chain Management and Facility Location, while Prof. Mahesh Caisucar's area of research is New Product Design & Development and Multi Criteria Decision Making.

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MECHANICAL ENGINEERING DEPARTMENT

GOA COLLEGE OF ENGINEERING

FARMAGUDI, PONDA, GOA.