Fr. Conceicao Rodrigues College of Engineering

TOOL BOX

The Production Newsletter

Volume - 3

Academic Year - 2019-20

Thank You

We are very thankful to the alumni of 1991 batch of Production Engineering for donation of SOLIDWORKS (3-D Modelling and Simulation) software license which is very beneficial for both academics as well as for the students of various Technical Teams such as Team CFR, Team Vaayushastra and Team Abadha. We really appreciate your kind gesture.

PREFACE

Bachelor in Production Engineering was the first ever field with which 'The Father Agnel Ashram' was converted to the reputed 'Fr. Conceicao Rodrigues College of Engineering', all the way back in 1984 with an intake capacity of 60 students. Post inauguration, other engineering disciplines such as Electronics Engineering, Computer Engineering and Information Techonology entered in the frame in the year's 1987, 1991 and 2001 respectively. The college observed its first ever batch of Mechanical Engineering in the year 2019, with an intake capacity of 60 students. The college also offers Post- graduate degree in Mechanical and Electronics Engineering with an intake capacity of 18 students.

It is considered to be the best institute for Production Engineering due to its advanced and industrial training approach, facilities and infrastructure. The motto "Moulding Engineers who can build the nation" does total justice to this institute on the account of its dedicated and disciplined academic approach, staff, infrastructure, research facilities, a strong alumni network and above all, outstanding campus placements. The college has various technical and non-technical teams, and councils which helps the students showcase their innate capacities and capabilities. And hence, this newsletter is a cumulative and continuous effort to acknowledge the dedication and diligent efforts made by the students and the teachers as a whole.

Acknowledgement

The team is grateful to Prof. S.K. Das for leading us and giving us his valuable input throughout the process of creating this newsletter.
We would also like to thank our respected HOD Prof. V.S. Jorapur for supporting us and making sure we make a newsletter that could aptly project our branch.
All the team members are thankful to all the students and faculties who have helped us in getting data and also all the councils and teams for co-operating with us for the same.

MISSION

• To impart quality education through state-of-art facilities and appropriate mentoring for holistic development of students matching with the changing needs of the stakeholders.

• To encourage and motivate faculty to take up research and consultancy.

• To collaborate with industries, R & D organizations, professional societies and educational institutions for excellence in teaching and research.

• To enable development of newer and cost competitive manufacturing technologies for providing better quality of products and services.

VISION

The Production Engineering Department aspires to be recognized for outstanding education and research leading to holistic development of well- qualified technocrats who are innovative, entrepreneurial and motivated for realizing manufacturing and operational excellence to achieve Indian prominence in the global arena.

From HOD's Desk:

It gives me immense pleasure to introduce the Third volume of Production Engineering Department News Letter. This newsletter emphasises basically on the events organised by the department as well as participation of technical teams in different national and international technical competitions. In addition, upgradation of facilities and infrastructure are also highlighted. Research being an important component of any educational institution, the newsletter showcases the articles published, awards and medals won by faculty as well as students. Participation by students through different councils cannot be ignored as it gives an extra edge to the overall development of the student. I am thankful to the Management, Principal, faculty in-charge and team members of newsletter for making this possible.

Dr.V.S.Jorapur,
H.O.D. Production Engineering Department.

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Achievements

(A) RESEARCH PUBLICATIONS

1.) Joshi K.N., Patil B. T. (2020), Performance Evaluation of Various Texture Analysis Techniques for Machine Vision based Characterization of Machined Surfaces, International Journal of Computational Vision and Robotics (IJCVR) (Inderscience Publications) (Accepted) (Scopus Indexed)

2.) Joshi K.N., Patil B.T., & Vaishnav H. (2020). Principal Components Based Multivariate Statistical Process Monitoring of Machining Process Using Machine Vision Approach. In New Paradigm of Industry 4.0 (pp. 145-160). Springer, Cham.

3.) Shaikh V. A., and Boubekri N., (2020), Using Vegetable-oil based Sustainable Metal Working Fluids to promote Green Manufacturing, International Journal of Manufacturing, Materials and Mechanical Engineering (IJMMME), Vol: 1, No. 1 ISSN: 2156-1680 (Scopus Indexed)

4.) Singh D. S., Patil B. T., Shaikh V. A., (2020) "Investigation of Cooling Time Reduction of Door Handle for Plastic Injection Molding Using Conformal Cooling Channels", Materials Today: Proceedings. First International Conference on Recent Advances in

Materials and Manufacturing ICRAMM, Sept 2019, Belagavi, India. Accepted in materials today proceedings by Elsevier Publications https://doi.org/10.1016/j.matpr.2019.11.316 (In Press)

5.) Rao M. V. B., Patil B. T., Shaikh V. A., Sudhakar D. S. S., (2019) "Recent Studies of Al2O3, Graphene and MoS2 Nano-Materials in Metal Working Fluids for Turning Steel – A Review", First International Conference on Recent Advances in Materials and Manufacturing ICRAMM, Sept 2019, Belagavi, India.

6.) Kawade P, Vaishnav H. B., Joshi K. N., (2019) "Finite Element Simulation of Milling Process with Cryogenic Precooling of Workpiece", First International Conference on Recent Advances in Materials and Manufacturing ICRAMM, Sept 2019, Belagavi, India

7.) Deshmukh S. P., Deshmukh P. D., Patil B. T., & Thampi G. T. (2019). Exploring the factors to make e-commerce and m-commerce ubiquitous and pervasive to improve national productivity of India. International Journal of Productivity and Quality Management, 28(4), 457-496. DOI: https://doi.org/10.1504/IJPQM.2019.103691 (Scopus Indexed)

8.) Joshi K. N. and Patil B. T., (2020). Prediction of Surface Roughness by Machine Vision using Principal Components based Regression Analysis. In International Conference on

Computational Intelligence and Data Science (ICCIDS 2019). Elsevier (Publication in proceedings by Elsevier Publications is in process) (Scopus indexed)

9.) Joshi K.N., Patil B.T., Vaishnav H.B. (2020) Principal Components Based Multivariate Statistical Process Monitoring of Machining Process Using Machine Vision Approach. In: Patnaik S. (eds) New Paradigm of Industry 4.0. Studies in Big Data, vol 64. Springer, Cham (Springer Book Series) (Invited by Editor in Chief) DOI: https://doi.org/10.1007/978-3-030-25778-1_7

10.) Dabreo Prince, Kokate Meera, Joshi Ketaki, Patil B. T. (2020), Machine Vision Based Interferometry for Measurement of Flatness Error in Micro and Nano Manufacturing, Second International Conference on Materials Science and Manufacturing Technology (ICMSMT 2020) (Accepted)

11.) Pradhnyal Kulkarni, Anurag Chavan, Shubham Chavan and Rajas Bhagwat of Be Production under the guidance of Prof. Hitendra Vaishnav published a research paper 'Improve the design structure of guide fins which are used for effective cooling of the battery pack in electric vehicles' which got selected and got in the proceedings of ICRAMM 2019.It was published in the Elsevier's Materials Today Proceedings, a conference proceeding journal.

12.) Komal Sudrik from TE Production presented a research paper on 'Supply Chain Competitiveness for Additive Manufacturing and Reverse Engineering' at the POMS international conference 2019 under the guidance of two NITIE professors which was later published in the Production and Operations Management Society (POMS) Journal.

Achievements

(B) Academic and extra-curricular achievements

Design patent filed by Ms. Ketaki Joshi (Research Scholar and Assistant Professor, Production Engineering),Dr.Bhushan Patil (Professor and Dean-Research and Development) and Mr.Hitendra Vaishnav(Assistant Professor, Production Engineering) for "Article for Image Acquisition and Measurement of Surface and Dimensional Quality" (Application Number:296740 dated 18th August 2017) is accepted and published in Journal No:29/2019 dated 19/07/2019.

1.) Our college badminton team achieved the 5th rank in the University Badminton tournament held by the Mumbai University. The team consisted of Nirav Sthalekar (captain from BE Production), Amandeep Singh Saini, Saumeel Gabhare, Joyston Maslamani and Chris Fernandez.

2.) BE PRODUCTION (2016-20 batch) won the Best Class trophy, Sports trophy and the Technical trophy during the academic year 2019-20.

3.) Saif Naqvi from BE Production bagged the Crescendo best performer trophy with 3000 plus points, Gandhar Kale stood third in the same event.

ACADEMIC TOPPERS

T.E. Production

Riddesh D Khatu
Grade: 9.11

Gandhar S Kale
Grade: 9.09

Anurag S Chavan
Grade: 8.46

S.E. Production

Tushar P Sharma
Grade: 9.61

Advait C Purav
Grade: 9.45

Priyam R Haldankar
Grade: 9.34

Technical Articles

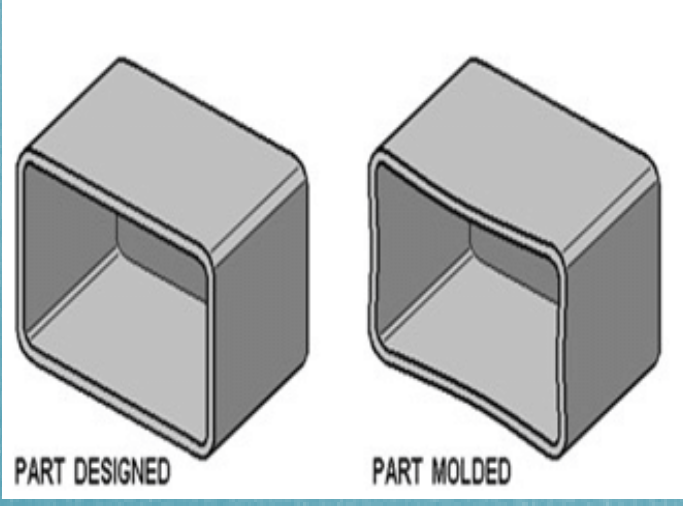
Our college alumni were successful in manufacturing and selling face shields that were used by the doctors, nurses and other medical staff for use in hospitals during the Covid-19 breakdown. They are a firm, Triaro and Co. who provide design services such engineering design, CAD, 3D rendering, prototyping and similar others.

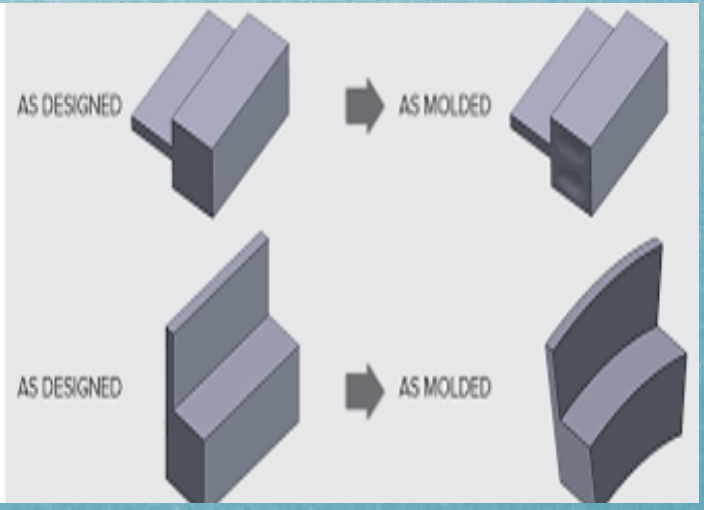
"We were working from home due to lockdown and that's when we decided to contribute our efforts to this fight against Covid 19. We started our search for ways in which we could help everyone. That's when we got the idea of face shield and it's importance for all those front-line fighters such as doctors, nurses, Allied Healthcare professionals, Police and many more. Hence, we started printing 3D printed face shields and started its supply. Considering the huge requirement of these shields, we were convinced that we had to pace up our production and the first thought we had was to approach our college Fr. CRCE. The response from Hitendra Sir, Sudhakar Sir, Sreeja Ma'am, Fr. Valerian and all the others were very spontaneous and they were very happy to provide the college 3D printer to our service. This really helped us for face shields and also for a new design of ventilator blower which we were designing for a client."

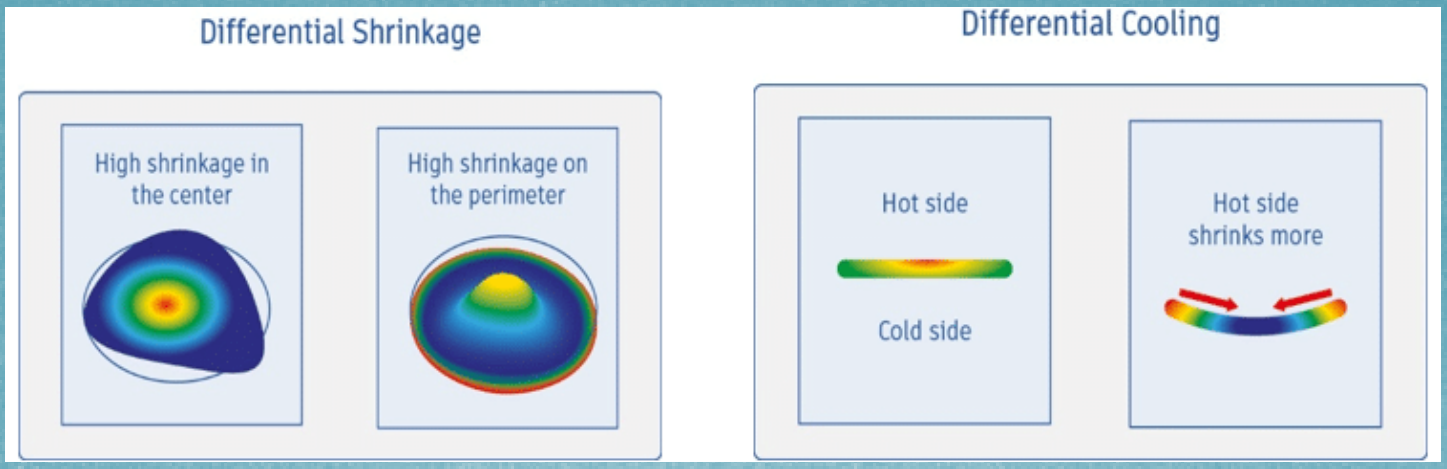
-Johney Xavier (Fr.Crce Alumni

Warpage - A defect caused by shrinkage in Injection Moulded Part

'Warpage' a term that is frequently used in the field of injection moulding, is the reason why most plastic parts fail and don't come out to their desired shapes and sizes. It's the deformation that occurs when there is uneven shrinkage in different areas of the plastic moulded part. A defect that has made the design engineers to look for ways in which the part design can be improved, mould design can be modified thus by improving the part geometry (avoiding non-uniform wall thicknesses), using simple but an efficient runner network, gate location, having appropriate cooling channels to reduce the cooling time etc. It however needs high investment and efficient techniques to execute these changes as injection moulding is an expensive moulding process. However manufacturers and designers aim to make this investment so that their plastic part comes out with minimum defects and the total time taken for manufacturing is reduced to have the best returns.



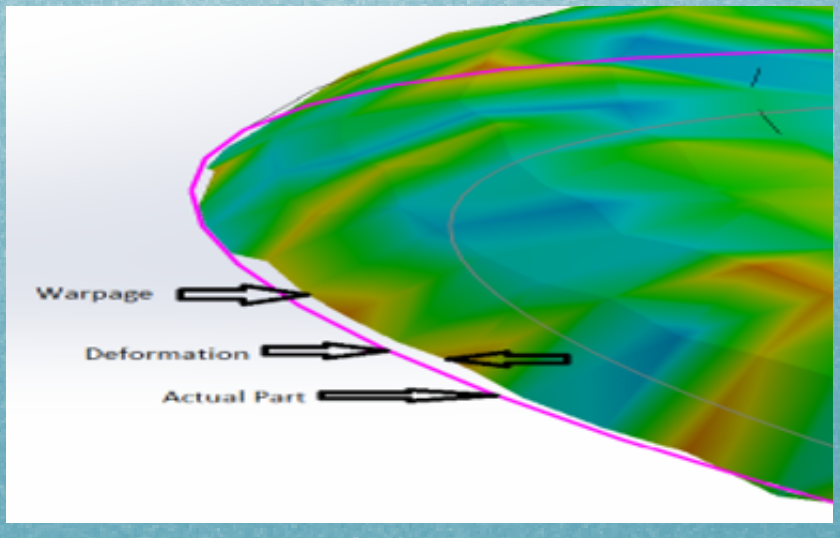




Study and simulation results show that 'warpage' may occur as thicker sections of the injection molded part cool slowly leading to depressions or deformations on the surface or thinner sections of the part which deforms due to excessive injection pressures thus not forming the desired shape. Parts made from amorphous materials like ABS, Polycarbonate, Polystyrene etc. are less prone to causing warpage as these plastics have a random molecular orientation and as these plastics undergo heating and cooling, they shrink uniformly as compared to semi-crystalline materials like Polypropylene, Poly-Acetylene, Nylon etc.

Other parameters like excessive/inadequate packing pressures, injection pressures, mold temperatures etc may cause warpage. Warpage results can be obtained by simulation on various injection moulding softwares like 'Solid works Plastic', 'Auto-desk mold flow' etc. to understand the nature of this defect, its causes and remedies.

Some results obtained through the warpage simulation analysis are shown below:

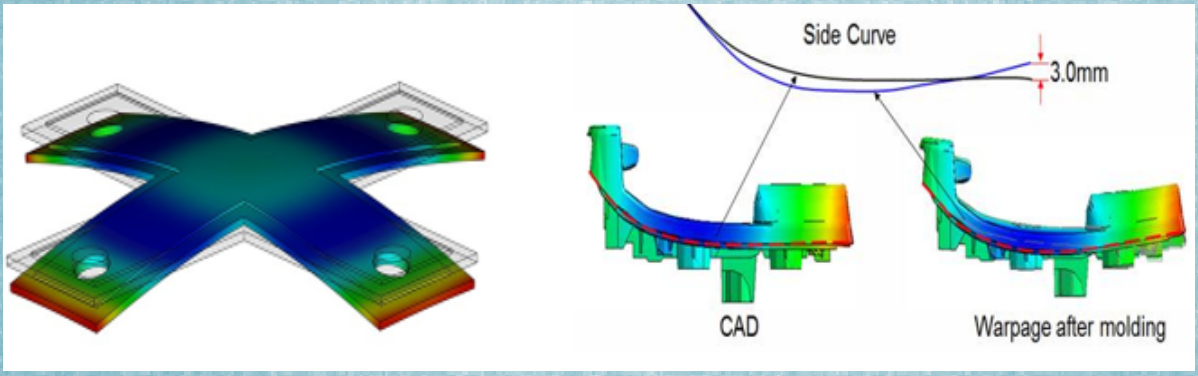


Deformation due to warpage is observed in all the three directions (X,Y,Z).

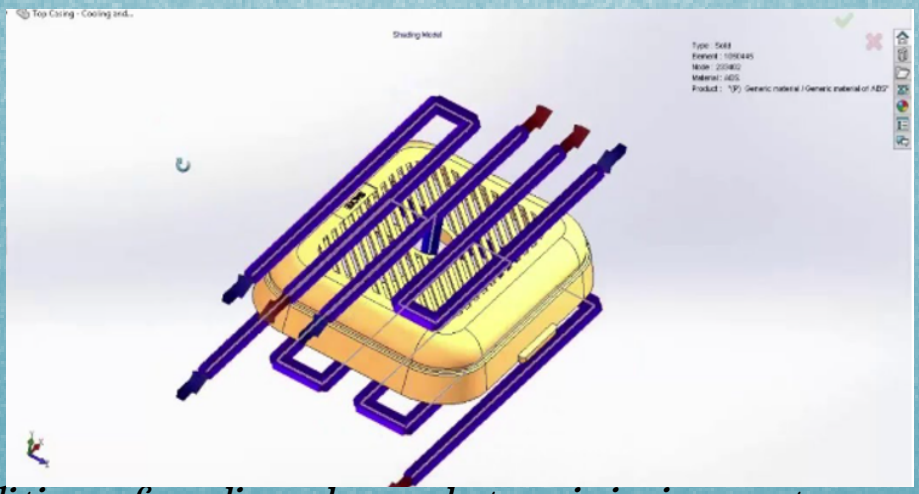
For the respective part, warpage observed in all the 3 directions are as follows:

Axis	Maximum	Minimum
X-X	0.183	-0.2484
Y-Y	0.1888	-0.1406
Z-Z	0.2	-0.2236
Total	0.26798	0.0020024

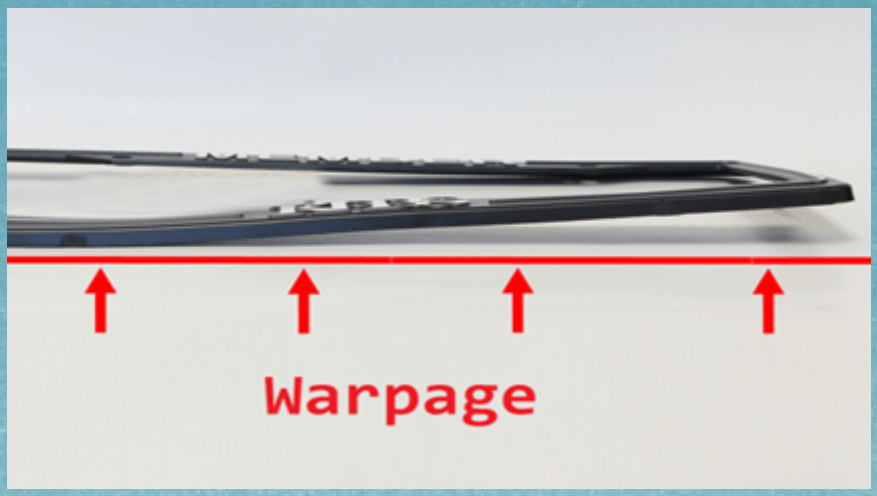
As it can be derived on the basis of the results obtained from simulation that maximum warpage is seen in the form of deformation as 0.2mm in the ‘z' direction with total warpage being 0.27mm. Its observed on the outer sections and the edge of the part. The obtained warpage can be minimized by addition of cooling channels, changing the gate locations or modifying the design of the part by eliminating the thicker sections and having a uniform wall thickness



Simulation on ‘Solid works Plastics’ showing deformation in the y direction.



Addition of cooling channels to minimize part warpage



There are multiple parameters that lead to warpage in any plastic injection moulded part and these may vary depending on various conditions like type of polymer used, melt temperatures, injection pressures etc. These simulation softwares help to understand the actual deformation or warpage in any injection moulded part thus saving time and increasing efficiency. Design engineers and manufacturers should make use of softwares more to avail its benefits.

- Advait Purav & Pratik Tarade
T.E. Production

Financial Literacy

There are things we know, but hearing it from someone else helps us remember and implement them. This article is one such piece, which focuses on being financially literate.

It's safe to assume that all of us already have a list of things we would want to buy when we start earning. But as a wise man once said, "*save before you spend*". It is an alien concept for most of us since we have never been educated properly about taxes, investments, assets and liabilities.

We know that if we earn more, we can buy more things. Sure, that's true, but for earning that money, we would have to put in our time and efforts. What we need to teach ourselves is how to put our money to work, generate income sources, and most importantly, how to save money.

So, how do you do all that? This newsletter is not the right place for that information. But it is an encouragement for you to study about the topics discussed in it.

Self control is number one, so let's get that out of the way. How else can you afford to buy that thing on your list?

Well,

1. Pay rent to your parents: Do your research on the legal way to process this, and pay rent. You can get tax exemptions and that is just more money in your pocket.

2. Start a Fixed Deposit: Check the interest rates in banks and do the maths. You won't be disappointed with that extra money.

3. Invest: You might not be ready for the commitment to the stock market, so start off with mutual funds and invest in gold and bonds. Do your research and let the experts grow your money.

4. Reinvest: Put the profit back into the system. Money grows money.

5. Avoid premium: Buy things you need, but avoid over glorified products. You can do well with a 10Mbps internet connection over a 2Mbps, but you don't need the 100Mbps.

6. ***NEVER BUY CREDIT CARDS!***

7. Learn about loans: Interest rates, unnecessary documentation, payback schemes, tax exemptions, EMI- don't get exploited by the companies. Get the best offers.

8. Watch your expenses: Put 25% of your income into savings. Now, spend in cash. You will value 500 rupees more in cash, than via card or online.

9. Spend your profits: Try limiting your extra expenses to the profits your investments generate. That way, your expenses don't deplete your bank balance.

10. Learn the basics of accounting: It helps knowing how your money flows. It's not just income vs expense, but also the balance that you have left, and the money your investments generate, the tax you pay, and how long it would take before you can afford a certain item.

As students entering the final year, we all are very uncertain about the future- placements, job safety, further education, everything. Regardless, financial literacy helps us survive crises such as the ongoing pandemic and hopefully, one day, live an independent, comfortable life.

- Pranavnath Tiwari
T.E. Production

Team Vaayushastra

Team Vaayushastra is a premier Indian aeromodelling team based out of Fr. Conceicao Rodrigues College of Engineering, Bandra. This year they participated in the SAE Aero Design East competition held in Lakeland, FL USA. The objective of the competition was designing, building and flying a model RC Aircraft that is built to fulfil a unique problem statement decided every year. This year, the team was required to design an aircraft that could simulate a human colonisation of Mars. For this, the Team had to create a Primary Aircraft that could carry within it, a smaller self-piloted aircraft to be dropped onto a designated landing spot.

For this, the team of undergraduate students came up with a truly remarkable design that incorporated several ingenious ideas involving top of the line technologies such as artificial intelligence, machine learning, composite materials etc. The final aircraft “Hermes” named after the Greek God of messengers proved every bit worthy of its name performing spectacularly in all stages of the competition allowing Team Vaayushastra to be placed 9th internationally among top ranked foreign universities. The team also finished 9th in the design report stage and 10th in the Technical Presentation judging along with receiving praise from both the judges as well as the fellow competitors.

Team Leader:
Soumil Mahajan (captain)

TEAM ABADHA

The Team Abadha CRCE builds a robust All-Terrain Vehicle (ATV) and competes in BAJA SAE INDIA, ENDURO STUDENT INDIA (ESI), MEGA ATV competitions in which engineering colleges from all over India compete and the Team Abadha CRCE has strived continuously over the years to make the best possible ATV prototype of India and each year, their results have only been better.

Back in the year 2015, the team participated in the International Series of Go-Karting and won the BEST MANUFACTURING AWARD in its first attempt at that competition.

In the year 2019, Team Abadha CRCE was able to secure an overall 35th rank and 2nd in Mumbai in the same competition held in NATRAX, Pithampur. One of the most commendable achievements was that the year's buggy was the lightest, coming down from 480 kgs in 2012 to 140 kgs in 2019.

However, the team brought real glory to the college in the year 2020, when they secured a thumping podium finish bagging an All India Rank-5 and bringing home the Winning Trophy for the “Marketing Presentation Event”.

In spite of being the smallest team at the competition member- wise, the team managed to outclass the rest of the teams with their skill and determination and came out with flying colours.

Team Abadha CRCE, was founded under the guidance of Prof. D.S.S. Sudhakar (H.O.D. of Production Engineering) in 2012, and propelled to the rise by th faculty advisors, Prof. Hitendra Vaishnav and Prof. Miriyala V.B. Rao as well as all the faculty members of the college. It became the first technical team to represent Fr. CRCE at the national level as a pioneer of encouraging students to practically apply the knowledge acquired through the course of four academic years.

TEAM LEADER (2020):
Sharvil Khot. (captain)

CRCE FORMULA RACING

Team CRCE Formula Racing is a formula student team of 35 students from Fr. Conceicao Rodrigues College of Engineering, Bandra which builds a Formula Student (FS) race car and participates in various Formula Student events held across the India.

Team CFR started with the design phase of its latest Formula Student car, 'GOD SPEED 2.0' in the month of March 2019; followed by the manufacturing phase in July and the testing phase in December 2019. All parts were designed, procured and manufactured by the team members itself. The team was expected to stick to a strict schedule throughout the making of their car, which was laid down by the competition officials. With about 90 participating teams, time was a crucial element at the competition; and once again this year the team was prompt in following this schedule due to which the team was upgraded to a 'Tier 1' team. A 'tier 1' team over a 'tier 2' team benefits considerably by getting preference in any event queue.

The team participated in Formula Bharat 2020 held in January at the Kari Motor Speedway, Coimbatore. The car was judged on the engineering practices that were followed while it's making and the cost and design considerations. There were a series of static and dynamic events on whose basis points were given and the overall rank of the team was decided. Team CRCE Formula Racing secured 25th overall on a national front amongst 90 participating teams. This project was a success because of the support of its sponsors and well wishers. Team CFR looks forward to perform its best at the upcoming event SAE Supra 2020 held at Buddha International Circuit, Delhi, where there is an expected participation of over 110 teams.

With a new project, come's new responsibilities and new challenges. And accepting them helps the team climb higher towards success.

TEAM LEADER(2020):
Raj Dungrani. (Captain)

ROBOCON

An exceptional combination of disciplines like Production, Computer and Electronics implied together to design a Robot which is capable of executing various miscellaneous functions and a team which uses both practical as well as theoretical knowledge helping an individual to develop as a skillful Engineer is team 'Robocon'. The opportunities offered to the individual participants are boundless as he/she gets a wonderful chance to learn the basics of robotics from the scratch, working as a team where each member evolves in various artistry of robotics, participate in various competitions where the team is assigned a specific problem statement and much more.

Dr. Deepak Bohir along with Mr. Saurabh Korgaonkar (Department of Production Engineering) and Ms. Kranti (Department of Electronics Engineering) are the major backbone of the team. The team is guided by current Capt. Shantanu Parab (Department of Electronics Engineering). The team values determination, hard-work, dedication, consistency, efficiency, motivation, innovation and strength. The major competition in which team Robocon CRCE participates is ABU Robocon, which is a world-renowned Robotic platform. The theme for this year's competition was Rugby 7s: The Rugby Game in which team Robocon was ranked 11th Nationally and successfully cleared the first round of the competition.
Team Robocon aspires to be one of the finest team in the country by valuing and nurturing the raw talents of an individual.

Team Captain :
Shantanu Parab

IIIExCRCE

IIIE stands for Indian Institution of Industrial Engineering. The council was formed on 1st November 2017 and has been active under the guidance of Prof. S.K.Das, Prof. M.V.B Rao and Dr. Bhushan Patil.

Under the leadership of Chairperson Chirayu Jha and Vice-Chairperson Khushi Mehta, IIIExCRCE had a great feat in the year 2019-20. This accomplishment has been possible because of the determination, aspiration and a belief to work towards something that helps the students and the community as a whole by all the team members. The council organised various successful events throughout the year. 'Techno-talks' and 'paper planes' were the two events organised in the 'CRESCENDO 2019' tech. fest and were acknowledged in enormous numbers. For SYNERGY-2019, the council actively hosted enjoyable games such as FIFA 19 and Game of straws. Also, in the year 2019, IIIExCRCE organised an industrial visit to Mahindra and Mahindra industries situated in Igatpuri.

The council had a great start in 2020 by organising an industrial visit in January at Central Railway workshop, Matunga wherein, the students were shown different machineries required to build a train. For innovation day, the council came up with an equally innovative event of 'Best Design Creator'. A certificate of appreciation in recognition of an 'outstanding innovative activity' was awarded to the IIIExCRCE council (secured 3rd prize).

Because of these activities the council members as well as the participants were able to prove their capabilities with innate capacities. Altogether the year 2019-20, emerged to be victorious.

- Shray Pandey (Secretary, IIIExCRCE)

SAE

SAE INDIA stands for SOCIETY OF AUTOMOTIVE ENGINEERS INDIA. SAE Collegiate Club of FR. CRCE is a council which provides an opportunity for students to go beyond the textbook theory and replicate the process of engineering

A seminar on “How to convert your project idea into a business model” was held in which our beloved Council head Prof. Hitendra Vaishnav explained the students the procedure of taking the raw idea and creating it into a market viable product. A Seminar on “A Technical Chapter FR. CRCE” bridged a link between the freshers and the students in the technical teams to give them a summary of how the team and their respective competitions work. It involved a large generated interest among the freshers to join the several teams.

An Industrial Visit for 3rd Year Production Engineering Students was conducted to Vimal Steel, Vasai to educate students on practical knowledge and live scenario of a factory.

Innovation day held by the IIC council included a activity presented by every council. SAE council presented with “INNOVETESY” where students just write down the problems that student have with the institute and won 2nd prize for the same. SAE was one of the 4 councils that had organized the 10-day industrial visit to Shimla-Manali- Chandigarh. It was a great experience and a learning opportunity.

There are three technical teams that come under SAE CRCE i.e TEAM ABADHA, TEAM CRCE FORMULA RACING AND TEAM VAAYUSHASTRA. These teams participate in various SAE INDIA events and also win competitions. The students use theoretical and practical knowledge to create something new. The ideas are beyond the realm of imagination.

-Jay Patel (Secretary, SAE)

SME

SME (Society of Manufacturing Engineers) is a group of students and faculty who share a common vision of an inspired, educated and prosperous manufacturing community. Our mission is to try our best to promote manufacturing technology and develop the skills of our members. In the past 4 years, the council has grown more than ever. The credit goes to the team members who have planned interesting and informative workshops with hands-on experience and many exciting events.

In March 2019, a 3-days CNC Workshop was planned in accordance with SIEMENS. This workshop was planned to deliver theoretical as well as practical knowledge to the students. Part of the workshop was held on-site to get experience of an actual cutting-edge CNC controller. The workshop was be conducted in SIEMENS facility in Mumbai. The college annual tech fest. CRESCENDO which is scheduled in March 2019, the council has been preparing to give all the visitors a taste of Industrial Technology by conducting two purely technical events. The first one was our flagship event, 'CAD WARS' which challenged the participants on how good they are with softwares such as AUTOCAD, NX, and SOLIDWORKS. For this event, the participants were given a problem statement. The second non-technical game is "Tech Pong" which was introduced this year. The council organizes Industrial visits each year for students to get practical knowledge.

Lastly and most importantly, we are thankful to Prof. V.S Jorapur, Head of Production Engineering Department for encouraging and guiding us in all the activities performed by the SME council. All in all, with a very successful year we intend to develop even more and continue to have a positive impact on the manufacturing engineering community.

-Pradnyesh Dound (Vice - Chairperson, SME)

SME CRCE

INFRASTRUCTURE & FACILITIES

SOFTWARE FACILITIES:

1 SIEMENS
2 NX 11
3 SOLIDWORKS
4 ARENA
5 ANSYS.

1. PLC IN AUTOMATION LAB.
2. BMW TWIN POWER TURBO 4-CYLINDER DIESEL ENGINE.
3. DELL WORKSTATIONS IN ALL CAD & CAM LABS.
4. 3D PRINTING MACHINE BASED ON FDM TECHONOLOGY.
5. VICKERS HARDNESS TEST AND DYNAMOMETER.
6. METROLOGY LAB, INDUSTRIAL ENGG. & OPERATIONS MANAGEMENT LAB.
7. DIGITAL MICROSCOPE

WORKSHOP

Hands on experience on:

- **CNC Machine**
- **20+ Lathe machines**
- **Shaping machine**
- **Deckle machine**

(Universal Milling Machine,used in making parts of 'Aryabhatta' was dormant for many years and now used for instructional purpose)

- **16 Ton sensor mechanical press with safety.**
- **Submerged Arc welding machine.**
- **Grinding machine.**

B.E Production Internship 2019-20 Records

Sr.no	Company Name
1	L&T
2	Zeal Medical Pvt. Ltd.
3	Maruti Suzuki India Limited
4	Reychem rpg ltd
5	Decathlon Sports Private Limited
6	Abhijeet Dies and Tools
7	Insteel Engineers Pvt. Ltd.
8	Indian Pneumatic and Hydraulic Co. Pvt. Ltd.
9	Sunita Tools Pvt. Ltd.
10	Gemsons Precision Engineering
11	Precihole Machine Tools Private Limited
12	Stellar value chain solutions Pvt Ltd.
13	Mercedes Benz India Limited
14	ACG Capsules Pvt. Ltd.
15	Mercedes Benz India Limited
16	Proteus technologies
17	Bosch India Ltd.
18	Autoforms
19	Krupa Containers Pvt. Ltd.
20	Siemens
21	Petrocil Engineers and Consultants
22	Tata Steel bsl
23	Kansai Nerolac Paints Limited
24	Sinex Primemovers

Sr.no	Company Name
25	Precihole Sports Pvt. Ltd.
26	Triaro
27	Redwing Aerospace Labs
28	Raltech Precision Engineering Pvt. Ltd.
29	Hilden manufacturing Pvt. Ltd.
30	Abbott
31	Tresmoto
32	Benninger
33	Harsh Precious Metal Pvt. Ltd.

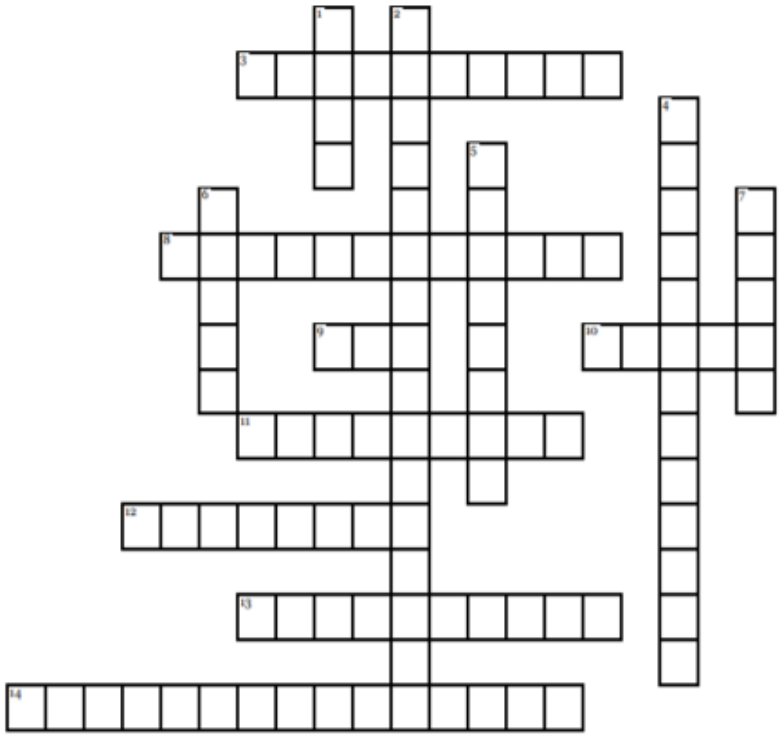
PLACEMENT RECORDS 2019-20

- L&T
- GODREJ
- TCS
- DECATHLON
- 99YEARS
- CRIMSON
- ROOP TELSONIC

CROSSWORD

Name: _____

College Knowledge Crossword

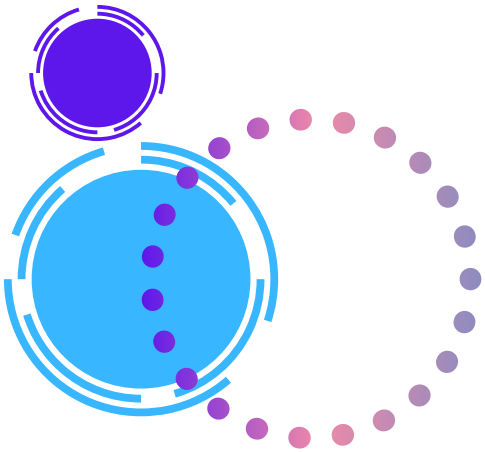


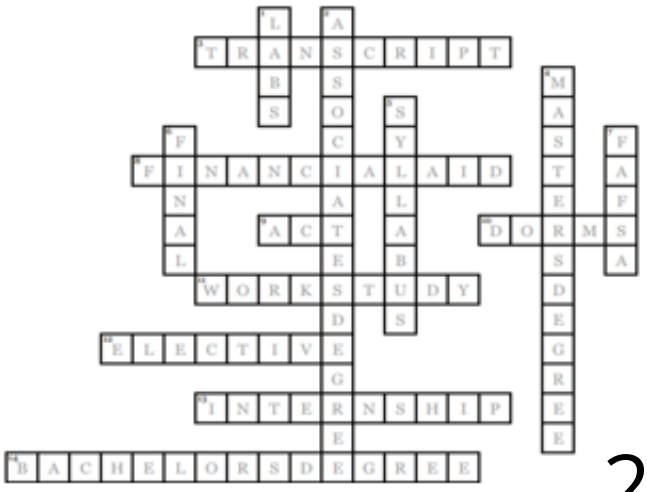
Across

3. Your official record of course work in high school or college
8. Anything related to the way you are paying for college (2 words)
9. One of the most common college entrance exams
10. On campus student living buildings
11. Federally funded program....on campus job
12. A class you can take that is not required by your major
13. A temporary job, usually in the field of your major
14. It usually takes 4-5 years to obtain this type of undergraduate degree

Down

1. Hands on science classes
2. Typically what you earn at a community college after completing 2 years of study
4. Sometimes, immediately after obtaining a Bachelor's Degree, student like to pursue their.....
5. An outline and schedule for a particular class
6. The last exam you take in a class
7. General financial aid application





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