



KCG
COLLEGE OF TECHNOLOGY



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KARAPAKKAM, CHENNAI - 600 097

DEPARTMENT OF MECHANICAL ENGINEERING

PROJECT ABSTRACTS

(2017 - 2018)

R2013



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VISION OF THE COLLEGE

KCG College of Technology aspires to become a globally recognized centre of excellence for science, technology & engineering education, committed to quality teaching, learning, and research while ensuring for every student a unique educational experience which will promote leadership, job creation, social commitment and service to nation building.

MISSION OF THE COLLEGE

- Disseminate knowledge in a rigorous and intellectually stimulating environment
- Facilitate socially responsive research, innovation and entrepreneurship
- Foster holistic development and professional competency
- Nurture the virtue of service and an ethical value system in the young minds

VISION OF THE DEPARTMENT

The Department aspires to become a globally recognized centre of excellence by producing competent professionals in Mechanical Engineering to serve as a valuable resource for industry and society.

MISSION OF THE DEPARTMENT

- Impart intellectually rigorous and holistic education to the students in the field of Mechanical Engineering.
- Establish state of-the-art facilities for research and consultancy work.
- Enhance the knowledge and skills of the faculty with the latest advancements in the Mechanical Engineering domain.
- Mentor the students to develop research and entrepreneurial capabilities.
- Inculcate a high degree of professionalism and contribute to the needs of industry and Society.

PROGRAMME OUTCOMES

PO/PSO No.	Description of the PO/PSO
PO1	Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	Design / Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Conduct Investigations of Complex Problems: Use research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6	The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Lifelong Learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.
PSO1	Model, analyze, design and realize physical systems, components or process by applying principles of three core streams of Mechanical Engineering, i.e. Design, Manufacturing , Thermal & Fluid Engineering.
PSO2	Apply the knowledge of AutoCAD, SolidWorks, ANSYS,CNC programming, Simulation softwares, MATLAB, Machine tool practices, Material & Machine testing, Fluid & Thermal machinery to solve real time Mechanical Engineering problems.
PSO3	Engage in lifelong learning and follow professional ethics, codes and standards of professional practices.

LIST OF PROJECTS

Batch No.	Register No.	Name of the Student	Project Title	In-House/ Industry Project	Name of the Supervisor
A1	3110141 14031	DWARAK.A	Investigation Studies on Mechanical and Tribological Properties of Aluminium Metal Matrix Composites	In-House	Mr. NISHANT B MAYEKAR
	3110141 14021	BALA VIGNESH.T			
	3110141 14043	HARI VENKATAR AMAN.I.S			
A2	3110141 14011	ARJUN JAYA PRAKASH	Multifunctional Agro Gantry Machine Assembly	In-House	Mr. M. ARUL INIGO RAJA
	3110141 14022	BEVIN T ABRAHAM			
	3110141 14050	JOSEPH GEOEGE			
A3	3110141 14006	ANIRUDH N.R	Experimental Study to Improve the Performance of Solar Powered Desalination	In-House	Mr. A. VENKATESA N
	3110141 14016	ASHVIN.J			
	3110141 14012	ARSHAD AHMED.S			
A4	3110141 14002	AGASTHYA. R	Design And Fabrication Of Chassis And Drivetrain Of Formula Student Vehicle	In-House	Mr. M. VIGNESH KUMAR
	3110141 14019	BALA SURYA.S			

A5	3110141 14044	HARSHA DYANESH.N	Design, Analysis And Fabrication Of Knuckle And Hub Assembly Of Formula Student Vehicle	In-House	Mr. M. VIGNESH KUMAR
	3110141 14009	ARAVIND.N			
	3110141 14045	HASAN KASIM.J			
A6	3110141 14701	DERRICK SAMUEL	Performance Improvement Of Cutting Tool By Surface Texturing	In-House	Mr. S. JESUDASS THOMAS
	3110141 14058	LOGASAI AATHITHIA AN.B			
	3110141 14047	JESHURUN VINEETH.S			
A7	3110141 14039	GOKULNAT H.A	Pneumatic Bumper And Brake Actuation System	In-House	Mr. V.GOPAL
	3110141 14035	GOKUL.S			
	3110141 14034	GOKUL.M			
A8	3110141 14025	BHARATH KUMAR.A	Machinability Studies of Titanium Alloy (Ti-6Al-4V)	In-House	Mr. K.GOBIVEL
	3110141 14053	KARTHIYEN. S			
	3110141 14308	NAVEEN.S S			
A9	3110141 14048	JOHNSON.E	Design, Fabrication And Analysis Of Thermo-acoustics Refrigeration	In-House	Mr. D.MURALI KRISHNAN
	3110141 14052	KARTHIK.R			

A10	3110141 14057	KUMARESA N.K	Characterization Of Mechanical Properties Of Aluminium Based Metal Matrix Composites Using Stir Casting Method	In-House	Mr. A. SAM DANIEL FENNY
	3110141 14046	JEBIN REX.J			
	3110141 14306	MOHAN.A			
A11	3110141 14013	ARUN KUMAR.B	Design Of Flexure Hinges Using Complaint Mechanism	In-House	Mr. V. GOPAL
	3110141 14024	BHARATHI.S			
	3110141 14030	DINESH KUMAR.D			
A12	3110141 14033	GEORGE BIRLA BOSE.J	Effect Of Zns,Tio ₂ ,Batio ₃ in Reinforcement Of Aluminum Hybrid Composites Through Powder Metallurgy	In-House	Mr. S.RAJESH KANNAN
	3110141 14041	HARIHARAN .R			
	3110141 14056	KISHORE KUMAR.V			
A13	3110141 14320	VIVEKANAN DAN.G	Design And Fabrication Of Safety System For Two Wheeler	In-House	Mr. M.ARUL INIGO RAJA
	3110141 14003	AJAY ARAVINDHA N P.V			
	3110141 14302	JAGAN.G			
A14	3110141 14023	BHARATHI.E	Emergency Steering System To Avoid Collision By Using	In-House	Mr. V.GOPAL
	3110141	ANTONY			

	14008	JEEVA.S	Microprocessor Controller		
	3110141 14010	ARAVIND P.C			
A15	3110141 14036	GOKULAKRI SHNA.R	Analysis And Performance Improvement Of Heat Sink Using PCM	In-House	Mr. A.SIVA RAMAKRISH NAN
	3110141 14037	GOKULAKRI SHNAN.Y			
	3110141 14028	DEEPAN.R			
A16	3110141 14032	ENOS JOEL MAKASIOS.J	Design Of Electric Drive Train For Assessment Of EV Performance Targets Using SimcenterAmesim	Industry	Mr. S.RAJESH KANNAN
A17	3110141 14051	JOSEPH ROY LENIN.S	Study Of Automobile Coolant Using Nano Particles	In-House	Mr. D. MURALI KRISHNAN
	3110141 14055	KISHORE KUMAR.M			
	3110141 14049	JOSEPH AGNEL ROMARIO.R			
A18	3110141 14004	AKILAN.S	Power Generation From Ventilated Parked Car	In-House	Mr. D.MURALI KRISHNAN
	3110141 14027	BLESSLY PRINCE.W			
	3110141 14018	AUGUSTIN THIRAVIAM SAM.J			

A19	3110141 14017	AUGUSTIN.S	An Investigation Of Production Loss In Plating Shop	Industry	Mr. NISHANT B MAYEKAR
A20	3110141 14005	AMULURU MOUNICK REDDY	Brake Failure Indicator And Engine Over Heating Alarm	In-House	Mr. A.SIVARAMA KRISHNAN
	3110141 14026	BIRADAUOL U KRISHNASAI			
	3110141 14310	RAKESH			
A21	3110141 14001	AAMIR MASSOUD	Method For Designing A Compliant Mechanism Based Displacement Amplifier	In-House	Mr. A.VENKATES AN
	3110141 14015	ASHLEY.V.J OHN			
A22	3110141 14007	ANTO DAMIEN.S	Effects Of Process Parameters In Wire EDM Of Inconel 625	In-House	Mr. I. MANIKANDA N
	3110141 14029	DHARMARA J.S			
	3110141 14020	BALAVIGNE SH			
A23	3110141 14316	VASANTHA N.R	Investigation On Characterization Of Wear Properties Of AL7075	In-House	Mr. M. ARUL INIGO RAJA
	3110141 14318	VISHNESHW ARAN.K.R			
	3110141 14314	SUJITH.S			
A24	3110141	VIJAY.J	Elimination Of	Industry	Mr. I.

	14319		Billet Undersize In Shearing Machine		MANIKANDAN
	3110141 14317	VIGNESH KUMAR.D			
B1	3110141 14104	VIGNESH.G.S	Carburation Of Mild Steel Using Reduced Graphene Oxide Produced From Organic Wastes	In-House	Mr. S.SATHYA PRASANTH
	3110141 14311	SREAYUS.P. MATHEW			
	3110141 14066	MULLAI VENTHAN.P			
B2	3110141 14089	SHRIRAM.S	Characterization Of Mechanical Properties Using Small Punch Test	In-House	Mr. A.SAM DANIEL FENNY
	3110141 14095	SUNDAR.R			
	3110141 14111	VISHNU.S			
B3	3110141 14087	SHANE NATHANAE L.P	Re-Tooling Of Valve Guide And Valve Seat Ring Pressing Machine	Industry	Dr. S. RAMESH
	3110141 14088	SHANKARA VARMA.P			
B4	3110141 14097	SURESH KUMAR.E	Improving Machining Performance By Green Cutting Fluid	In-House	Dr. N. PRAGADISH
	3110141 14102	VIGNESH.D			
	3110141 14084	SARAVANA N.T			

	3110141 14092	SIVABALAJI. N			
B5	3110141 14068	NAMBI DOSS.S	Analysis Of Sodium Release Under Pressurised Conditions During Core Disruptive Accident	Industry	Mr. A.U.MEENAK SHI SUNDARESW ARAN
	3110141 14078	ROSHAN JAMES			
B6	3110141 14065	MUHAMMA D KHALID . AR	Mitigating Car Cabin Air Temperature Using Hybrid Energy Source	In-House	Mr. A.VENKATES AN
	3110141 14113	VISHNUPRIY A.G			
	3110141 14085	SEENI MOHAMME D. J			
B7	3110141 14075	RAGHUL KRISHNA.R	Mechanical Fuse For Overhead Transmission Lines	In-House	Mr. A.U.MEENAK SHI SUNDARESW ARAN
	3110141 14076	RANJITH.V			
	3110141 14100	SYED ANSARI.Z			
B8	3110141 14067	MURALI BALAJI.S.P	Experimental Study of Cutting Forces in End Milling of Magnesium AZ31BAlloy in Dry Cutting Condition	In-House	Mr. K. GOBIVEL.
	3110141 14072	NITHYANAN DHAN.M			
	3110141 14108	VIJAYANAN DAN.D			

	3110141 14086	SENTHIL MURUGAN. V			
B9	3110141 14083	SARAVANA N.A.T	First Time Quality Reduction In Nozzle Used In CRDI	Industry	Mr. J.PRESENNA PRABHU
B10	3110141 14090	SIDDHARTH. G.V	Design Of Jig For Hub Bearing And Bolt Pressing For Various Hubs In Hydraulic Machine	Industry	Mr. J.PRESENNA PRABHU
B11	3110141 14069	NANDHA KUMAR.M	Performance Analysis On Steering Assembly To Improve Durability In C-EPS Tilt And Telescope Endurance Tester	Industry	Mr. M. SIVASHANKA R
	3110141 14093	SUBILESH.S			
B12	3110141 14063	MANSOOR A.G	Experimenting The Effectiveness Of Heat-Pipes With Tec Solution	In-House	Mr. AARON MATHEW
	3110141 14064	MICHAEL ROSHAN			
	3110141 14060	MANIKAND AN.S			
	3110141 14080	SAMUVEL V			
B13	3110141 14098	SURIYA.S	A Study Of Optimization Of Lignite Size	Industry	Mr. M.MANOJ

			Reduction In Lignite Handling System		
B14	3110141 14079	SAKTHIVEL. V	Permanent Magnet Assist Motor	In-House	Mr. M.SIVA SHANKAR
	3110141 14082	SANJAY.R			
	3110141 14107	VIGNESGH.R			
B15	3110141 14099	SURYA.K	Experimental Study Of Car Suspension Using Permanent Magnets	In-House	Dr. D.EASU
	3110141 14110	VIMAL KUMAR.V			
	3110141 14112	VISHNU DEV A.V			
B16	3110141 14115	VIVEK.S	Surface Texturing By Wire Cut EDM On Cutting Tool	In-House	Mr. S.JESUDASS THOMAS
	3110141 14116	WESLEY JOEL.K			
	3110141 14094	SUDHARSUN .G.A			
	3110141 14091	SIDDHARTH. D			
B17	3110141 14059	MAGENDRA N.M	Performance Studies Of In-house Developed Rapid Prototyping Machine	In-House	Dr. S.RAMESH
	3110141 14304	MOHAMME D INSHA			

	3110141 14305	MOHAMME D NAINAR			
	3110141 14321	YASHWANT H.T			
B18	3110141 14309	PEARLIN SIJU.S	Experimental And Numerical Analysis Of Buckling Of An Aluminum Tube Under Axial Load	In-House	Mr. PRINCE JEYA LAL
	3110141 14073	PERIASAMY. G			
	3110141 14071	NICKY PAUL EAPEN			
B19	3110141 14114	VISHNUVAR DHAN.A.R	Performance Analysis Of Turbocharged Diesel Engine	Industry	Mr. A.VENKATES AN
B20	3110141 14081	SANJAI RAHUL.G	Performance Analysis Of Naturally Aspirated Diesel Engine By Varying Valve Timing	Industry	Mr. A.VENKATES AN
	3110141 14312	SREEVATSA N.V			
B21	3110141 14077	RATHANAK UMAR.R	Emission Control In S.I Engine Utilising H-H-O Gas	In-House	Mr. M.MANOJ
	3110141 14062	MANOJ KUMAR.A			
	3110141 14106	VIGNESH.R			
B22	3110141 14103	VIGNESH.E	Experimental Investigation On Hardened Material	In-House	Mr. NISHANT B MAYEKAR
	3110141	SURENDHER			

	14315	.T	Using Small Punch Test And Characterization		
	3110141 14301	AJIT KUMAR			
B23	3110141 14070	NARENDHA R.R.S	Dual Axis Solar Panel Tracking System	In-House	Mr. M.SIVASHAN KAR
	3110141 14074	PRINCE NISSIAN DAVID.R			
	3110141 14096	SURENDAR. P			
B24	3110141 14313	SUGUMARA N L	Mechanical And Thermal Behaviour Of Hybrid Natural Fiber Reinforced Composites	In-House	Mr. S.SATHYA PRASANTH
	3110141 14307	MURALI.V			
	3110141 14303	KISHORE.V			

LIST OF INDUSTRY PROJECTS

Batch No.	Register No.	Name of the Student	Project Title	Name of the Industry	Name of the Supervisor
A16	3110141 14032	ENOS JOEL MAKASIO S.J	Design Of Electric Drive Train For Assessment Of EV Performance Targets Using Simcenter Amesim	Simpson & Co. Ltd.	Mr. S.RAJESH KANNAN
A19	3110141 14017	AUGUSTI N.S	An Investigation Of Production Loss In Plating Shop	Ashok Leyland Ltd.	Mr. NISHANT B MAYEKAR
A24	3110141 14319	VIJAY.J	Elimination Of Billet Undersize In Shearing Machine	Super Auto Forge Ltd.	Mr. I. MANIKANDAN
	3110141 14317	VIGNESH KUMAR.D			
B3	3110141 14087	SHANE NATHAN AEL.P	Re-Tooling Of Valve Guide And Valve Seat Ring Pressing Machine	Ford India Pvt. Ltd.	Dr. S. RAMESH
	3110141 14088	SHANKARA VARMA.P			
B5	3110141 14068	NAMBI DOSS.S	Analysis Of Sodium Release Under Pressurised Conditions During Core Disruptive Accident	IGCAR, Kalpakkam	Mr. A.U.MEENAKSHI SUNDARESWARAN
	3110141 14078	ROSHAN JAMES			
B9	3110141	SARAVA	First Time Quality	Delphi -	Mr.

	14083	NAN.A.T	Reduction In Nozzle Used In CRDI	TVS Diesel Systems Ltd.	J.PRESENNA PRABHU
B10	3110141 14090	SIDDHAR TH.G.V	Design Of Jig For Hub Bearing And Bolt Pressing For Various Hubs In Hydraulic Machine	Ashok Leyland Ltd.	Mr. J.PRESENNA PRABHU
B11	3110141 14069	NANDHA KUMAR. M	Performance Analysis On Steering Assembly To Improve Durability In C-EPS Tilt And Telescope Endurance Tester	Mando Automotive India Pvt. Ltd.	Mr. M. SIVASHANKA R
	3110141 14093	SUBILES H.S			
B13	3110141 14098	SURIYA.S	A Study Of Optimization Of Lignite Size Reduction In Lignite Handling System	Neyveli Lignite Corporation Ltd.	Mr. M.MANOJ
B19	3110141 14114	VISHNUV ARDHAN. A.R	Performance Analysis Of Turbocharged Diesel Engine	CSIR, Bangalore	Mr. A.VENKATES AN
B20	3110141 14081	SANJAI RAHUL.G	Performance Analysis Of Naturally Aspirated Diesel Engine By Varying Valve Timing	CSIR, Bangalore	Mr. A.VENKATES AN
	3110141 14312	SREEVAT SAN.V			

ABSTRACTS

Project Batch No	A1
Project Team	Bala Vignesh.T, Dwarak.A, Harivenkataramani.S
Project Title	Investigation Studies on Mechanical and Tribological Properties of Aluminium Metal Matrix Composites
Project Guide	Mr. Nishant B Mayekar
Abstract	<p>In the present decade, advanced researches are being undertaken in the stream of Aluminium Metal Matrix Composites (AMC's) to meet the ample demands of lost cost, better quality and higher efficiency in various applications like automotive and aerospace. The aluminium alloys when reinforced with different ceramics show improvement in the hardness, strength, corrosion resistant, and other mechanical and tribological properties. In this study, the effects of adding varying percentage of a reinforcement SiC along with secondary additions like Graphite, Fly ash, etc to the Aluminium MMC are consolidated and their improvement in mechanical properties is reviewed. This project also focuses on the wear behavior of Al MMC's, fabricated by using stir casting and squeeze casting techniques and wear tests conducted through pin and on disc wear tester with different parameters such as normal loads, sliding distances and sliding velocities. The applications of the composites are also presented.</p>

Outcomes	Published “Investigation of Dry Sliding wear behavior of AMMC using Taguchi Approach”, National Conference on Recent Innovations in Advanced material Science - RIAMS’ 18
	Published “Investigation Studies On Mechanical And Tribological Properties Of Aluminium Metal Matrix Composites - A Review”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18

Project Batch No	A2
Project Team	Arjun Jayaprakash, Bevin T Abraham, Joseph George
Project Title	Design and Fabrication of Multifunctional Agro Gantry Machine Assembly
Project Guide	Mr. M Arul Inigo Raja
Abstract	India ranks second worldwide in farm output. Agriculture along with forestry and fisheries accounts for 17% of the GDP in 2017 and 7.86% in global GDP. Majority of farmers in India are from economically backward background. Despite of our government providing so many opportunities and schemes, farmers are still using conventional methods of farming other than using advanced agricultural machinery and equipments. Smart farming concepts such as CTC (controlled traffic farming), Drip irrigation, solar farming is still a concept in Indian agricultural society. The main reason it's still a

	<p>concept is the financial instability of Indian farmers. Farmers are not able to afford latest technologies such as solar panels, drip irrigation system, combines, harvester.etc. In order to solve this problem we initiate our project <i>MULTIFUNCTIONAL AGRO GANTRY MACHINE ASSEMBLY</i> or <i>MAGMA</i>. The basic concept of <i>MAGMA</i> is to incorporate the gantry technology in the agricultural arena. <i>MAGMA</i> is a machine assembly primarily comprising of a simple gantry where agricultural modules such as seed drill, irrigation, harvester and grass cutter. Like a typical gantry the machine setup here is also remotely operated. Since <i>MAGMA</i> has a versatile function, an average Indian farmer need not worry about spending huge amounts of money on machinery. Since the setup and working is simple it becomes a onetime investment irrespective of expansion of farmland in future. Therefore being a onetime investment, <i>MAGMA</i> reduces the financial burden of an economically backward farmer. Our vision is to see <i>MAGMA</i> all across India, thus by making India a global leader in the agricultural sector.</p>
Outcomes	<p>Published “Design And Fabrication Of Multifunctional Agro Gantry Machine Assembly - A Review”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.</p>
	<p>Best Project in IET Intra-departmental Project Challenge-2018 competition organised by students chapter of IETKCTECH.</p>

	Short listed for the “Carbon Zero Challenge 2019” competition by IIT, Chennai, for receiving funds to fabricate the prototype.
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Project Batch No	A3
Project Team	Ashvin J, Arshad Ahmed S, Anirudh N R
Project Title	Experimental Studies to Improve the Performance of Solar Powered Desalination
Project Guide	Mr. A Venkatesan
Abstract	<p>Water being one of the major sources for a living they are in need now with the increase in population. The irony is that on Earth 75% is covered with water and only 25% is covered by land but still there is a serious demand for water. This project deals with the extraction of pure water from seawater using different apparatus to compare and study which gives maximum output and highly efficient with respect to the input. There are many types of desalination method that uses non-renewable sources like electricity or fuels, this project deals with the use of one of the major renewable resource- solar energy. Direct solar energy alone is sufficient to heat the water and convert it to its vapor form but the efficiency is very less. So to improve the heat inside we use different apparatus like Black surface, Aluminum Fins, Solar heater, Aluminum reflectors, Phase change materials (Paraffin wax and Zinc oxide) in copper tubes. These apparatus helps to increase the box temperature and hence the water gets vaporized</p>

	easily condenses and gets collected on the outlet tube. Theoretical analysis using software is done and calculated the amount of heat transfer that takes place and the changes from traditional form of solar desalination is compared. This project helps to convert the seawater to pure water even during the night time with the help of PCM and Solar heater so all day round this keeps working and water keeps coming out regularly. Various types of combinations are tested and result is graphed.
Outcomes	Published “Experimental Studies To Improve The Performance Of Solar Powered Desalination”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.
	Participated in IET Intra-departmental Project Challenge-2018 competition organised by students chapter of IETKCTECH.

Project Batch No	A4
Project Team	Bala Surya.S, Agasthya.R
Project Title	Design, Analysis and Fabrication of Chassis and Drivetrain of Formula Student Racecar
Project Guide	Mr. M Vignesh Kumar
Abstract	The chassis and drivetrain of a racecar built for a formula student competition are expected to have much higher performance parameters compared to regular cars. This report presents an approach on designing a lightweight racecar chassis and the drivetrain of a formula student

	<p>racecar consisting of the differential, driveshafts and tripods using DS Solidworks. The properties of different materials that can be used for the given component are then studied. They are then analyzed individually using Ansys to check if they meet structural, aesthetic, ergonomic and safety demands. The best material is chosen based on the analysis performed and critical parameters such as performance, weight, yield strength and cost. The designed chassis and components are then fabricated to the required tolerances using jigs and fixtures as required and assembled for testing. This is done to ensure best performance with low cost, ease of handling & manufacture, simple maintenance and lesser weight.</p>
Outcomes	<p>Published “Design, Analysis and Fabrication of Chassis and Drive Train of Formula Student Race Car”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.</p>

Project Batch No	A5
Project Team	Harsha Dyanesh, HasanKasim J., Aravind N
Project Title	Design, analysis and fabrication of knuckle and hub Assembly of a Formula Student Vehicle
Project Guide	Mr. M Vignesh Kumar
Abstract	Formula student vehicles are built by institutional teams across the globe for various competitions. The activity is becoming an

	<p>integral part in the understanding of vehicle dynamics for students. This paper intends to talk about the design and analysis processes associated with the fabrication of knuckle and hub assembly in one such vehicle. The knuckle and hub systems are extremely important components in a vehicle as they are directly involved in the running of the vehicle. Therefore, it is of paramount importance for these to be designed in a way that the safety standards are met, while keeping in mind the cost factor that is involved in the fabrication of the same. The materials used, differences in properties of similar materials used for the fabrication of the knuckle and hub assembly and the analysis of the designs with respect to Factor of Safety and stability during running will be described in detail.</p>
Outcomes	<p>Published “Design, Analysis and Fabrication of Knuckle and Hub Assembly of a Formula Student Vehicle”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.</p>

Project Batch No	A6
Project Team	Jeshurun Vineeth Roshan, Derrick Sam, Logasai Aathithian
Project Title	Performance Improvement of Cutting Tool by Surface Texturing
Project Guide	Mr. S Jesudass Thomas
Abstract	In cutting processes, the improvement of anti-

	<p>adhesive properties and wear resistance of cutting tools are constantly and strongly required to increase the tool life. Therefore, many cutting tool technologies pertaining to material, geometry, surface coating, and surface finishing have been developed. Researchers have studied the application of controlled surface micro textures on cutting tool surfaces to improve machining performance by changing the tribological conditions at the tool-chip and tool-workpiece interfaces. An experiment to study the performance of the textured tungsten carbide cutting tool insert in machining of Nickel Based Super alloy Inconel 718 is carried out. Textures were prepared on the rake face of the insert near the cutting edge by Rockwell hardness tester and Vickers hardness testers. Dry cutting tests were carried out on Nickel Based Super alloy Inconel 718 using lathe machine with uncoated Carbide tool insert for different cutting parameters such as feed, depth of cut and cutting speeds. Lathe tool dynamometer was used to record the cutting force during machining. Surface Roughness was checked using the Surface Roughness tester. The results demonstrate that the surface texture on the rake face of cutting tools has significantly reduced the cutting forces, when compared with that of the un-textured tool insert.</p>
Outcomes	<p>Published “Performance Improvement of Cutting Tool by Surface Texturing”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.</p>

Project Batch No	A7
Project Team	Gokul S, Gokulnath A
Project Title	Pneumatic Bumper and Brake Actuation System
Project Guide	Mr. V Gopal
Abstract	<p>The technology of pneumatics has gained tremendous importance in the field of workplace rationalization and automation from old-fashioned timber works and coal mines to modern machine shops and space robots. It is therefore important that technicians and engineers should have a good knowledge of pneumatic system, air operated valves and accessories. The aim is to design and develop a control system based intelligent electronically controlled automotive bumper activation and automatic braking system is called “AUTOMATIC PNEUMATIC BUMPER AND BRAKE ACTUATION BEFORE COLLISION”. This system is consists of IR transmitter and Receiver circuit, Control Unit, pneumatic bumper system and pneumatic braking system. The IR sensor is used to detect the obstacle. There is any obstacle closer to the vehicle (within 3-4 feet), the control signal is given to the bumper activation system and also pneumatic braking system simultaneously. The pneumatic bumper and braking system is used to protect the man and vehicle. This bumper and braking activation system is only activated the vehicle speed above 30-40 km per hour. This vehicle speed is sensed by the proximity sensor and this signal is given to the control unit and pneumatic bumper and braking activation system.</p>

Outcomes	Published “Pneumatic Bumper and Brake Actuation System”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.
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Project Batch No	A8
Project Team	S. Karthikeyan, S.S Naveen, A. Bharath kumar
Project Title	Machinability Studies on Ti-6Al-4 V Alloy using Tin and Al ₂ O ₃ Inserts
Project Guide	Mr. K Gobivel
Abstract	<p>Ti-6Al-4V is a titanium alloy which has high strength to low weight ratio and it is widely used in aerospace industry and biomedical implants but machining of Ti-6Al-4V produces large amount of heat at the chip tool interface which can affect both the tool and workpiece. In this work, machining of Ti-6Al-4V on conventional lathe machine by using TiN(Titanium Nitride) and Al₂O₃ (Aluminium Oxide) inserts was conducted. Totally 18 experiments were conducted by using dry turning process with three different medium spindle speed along with three different levels of feed with a constant depth of cut of 1mm. Cutting forces, thrust forces and feed forces were analyzed to understand the material deformation. Also Scanning Electron Microscope Image of tool inserts has been analyzed to find the tool wear.</p>
Outcomes	Published “Machinability Studies on Ti-6Al-4V Alloy using TiN and Al ₂ O ₃ Inserts”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	A9
Project Team	E Johnson, R Karthik
Project Title	Design, Fabrication and Analysis of Thermo-acoustic Refrigeration
Project Guide	Mr. D Muralikrishnan
Abstract	<p>Thermo-acoustic refrigeration is one of the harmless type of refrigeration system without any use of any harmful ozone depleting gases and moving parts. Thermo-acoustic is a subject dealing generally with effects acoustic in which heat conduction and entropy variation of a medium play a role. Thermo-acoustic refrigeration is the generation of sound by the heated surface and the process of transfer of heat transfer from one place to another by the sound medium. This project deals with designing of resonating column, acoustic driver section and analysing the temperature difference by means of various stack materials which readily radiate the heat inside the resonating column and the cooling takes place by means of compression and expansion of atmospheric air due to sound waves inside the column. Acoustic waves experience displacement oscillations and temperature oscillation in association with the pressure variations. The results showed a significant difference in temperature variations with the atmospheric temperature.</p>
Outcomes	Published “Design, Fabrication and Analysis of Thermo Acoustic Refrigeration”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	A10
Project Team	Jebin Rex J, Kumaresan K , Mohan A
Project Title	Characterization of Mechanical Properties of Aluminium Based Metal Matrix Composite AA6061/ZrO ₂ /SiC Using Stir Casting Method
Project Guide	Mr. A Sam Daniel Fenny
Abstract	<p>Composite materials have revolutionized the field of engineering by giving rise to light weighted and high performance materials in modern engineering applications, like automotive and aerospace, foreseeing its possibilities this work focuses on fabrication and testing the mechanical and metallurgical properties of composite materials with Aluminum of grade 6061 as base matrix and Silicon Carbide and Zirconium dioxide particles as reinforced in various proportions such as (SiC 2%,ZrO₂ 2%),(SiC 6%, ZrO₂ 2%),(SiC 2%, ZrO₂ 6%) are fabricated by using stir casting which is the most economical. The Aluminum alloys when reinforced with different ceramics show improvement in the hardness, strength, microscopic structure, corrosion resistant and other mechanical properties. The applications of the composites are also presented.</p>
Outcomes	<p>Published “Characterization of Mechanical Properties of Aluminium Based Metal Matrix Composite Al6061/ZrO₂/SiC using Stir Casting Method”,National Conference on Mechanical, Aeronautical and Civil Engineering -NCMACE’ 18.</p> <p>Published “Characterization of Mechanical Properties of Aluminum Based Metal Matrix Composites using Stir Casting Method”,</p>

	International Conference on Scientific Research and Innovations-1.0 - Organized by ATALON & Chennai Institute of Technology, Chennai.
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Project Batch No	A11
Project Team	Arunkumar A, Bharathi S, Dinesh kumar D
Project Title	Design of Flexure Hinges using Compliant Mechanism
Project Guide	Mr. V Gopal
Abstract	<p>Most mechanical designs rely on rotation of some sort in order to function many of these designs make use of pin joints to satisfy rotational requirements the drawback of pin joints is that backlash can affect the performance of the system, When designing on a micro scale the backlash problem becomes a more significant issues. Flexure hinges relatively new strategy for providing zero backlash rotation flexure hinges on a micro scale are not yet well understood and this project designed to further the research in micro scale flexure hinges. A flexure hinge consists of a flexible, slender region between two adjacent rigid parts that undergo relative limited rotation in a mechanism and is the important constituent of lumped compliant mechanisms. Flexure hinges have several advantages over conventional rotational joints due to being monolithic with the rest of the mechanism. They have no friction losses, no need for lubrication, and no backlash. Therefore, flexure hinges are widely used in translation</p>

	micro positioning stages, scanning tunneling microscopes, high-precision cameras, robotic micro displacement mechanisms, and especially in micro-electro-mechanical systems.
Outcomes	Published “Design of Flexure Hinges Using Compliant Mechanism”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	A12
Project Team	R Hariharan, J George Birla Bose, V Kishore kumar
Project Title	Effect of Zns In Reinforcement of Aluminium Hybrid Composites Through Powder Metallurgy
Project Guide	Mr. S Rajesh Kannan
Abstract	Zinc Sulphide are reinforced with Al- Al_2O_3 Metal Matrix Composites(MMCs), and are made through powder metallurgy, in order to improve high strength, high hardness, good thermal conductivity compared with conventional materials. Three Metal Matrix Composites of test specimens are prepared with varying reinforcement ratio as Al- Al_2O_3 -ZnS (94:5:1), (93:5:2), (92:5:3) wt%, respectively. The hardness test result shows that the addition of reinforcement Zinc sulphide increases the hardness value. However, more concentration of ZnS shows reverse effect. The uniform distribution of particles in reinforced metal matrix Composites was studied in detail using

	optical microscopy. The surface topography and crystal structure of the representative composites were examined through scanning electron microscopy (SEM), X-ray diffraction (XRD) and Fourier transformation of infrared spectroscopy (FT-IR). Substantially, good agreement between numerical and experimental results was found.
Outcomes	Published “Effect of ZnS in Reinforcement of Aluminium Hybrid Composites through Powder Metallurgy”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	A13
Project Team	Vivekanandan.G, Ajay Ravindran.P.V, Jagan.G
Project Title	Design and Fabrication of Safety System for Two Wheeler
Project Guide	Mr. M Arul Inigo Raja
Abstract	With increasing population and the density of vehicular traffic accidents are inseparable part of human life. Each year about 2 percent of motor vehicle crash deaths are motorcyclists. In a majority of motorcyclist deaths, the most serious injuries are to the head and spinal cord highlighting the importance of wearing a safety device. Airbag is a safety feature incorporated in many four wheelers. Two wheeler accidents prove fatal in most of the cases, hence an airbag has been designed for safety of the driver. The

	concept of this airbag system is “To reduce the injuries to a rider when impacting with an opposing vehicle and/or opposing object in frontal collisions by absorbing rider kinetic energy and by reducing rider separation velocity from motorcycle in the forward direction.” This prototype model works with the help of the mems sensors which takes the fall detection signal with angular position of 45 degrees or less and there by activating the solenoid valve for triggering the air bag at sensed position.
Outcomes	Published “Design And Fabrication of Safety System For Two Wheeler- A Review”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	A14
Project Team	Bharathi E, Antony Jeeva S, Aravind P C
Project Title	Emergency Steering System to avoid Collision by using Microprocessor Controller
Project Guide	Mr. V Gopal
Abstract	Present days, the automotive industry is mainly focusing on the road safety measures. The automobiles have been constantly updating with new sensing technologies to avoid vehicle crash due to physical damages and arrival of unexpected object in travelling path. This problem is one of the major cause for road accidents, almost 1.32 million people die in road accidents each year. For providing solution to the problems, in our project emergency steering

	<p>control system is introduced. This system activates the steering mechanism automatically to position the vehicle from the interrupted object, without causing maximum damage to the vehicle structure. Infrared sensor is used to detect the object which gets interfered in its path as well as it senses the safe position to stop the running vehicle. When the vehicle is moving out of control of driver at a certain speed, then if the vehicle faces the situation to collide with the resting object (say if the vehicles are waiting for signal and our vehicle is facing the above mentioned problem). The condition of the object got interfered on the path of moving vehicle is sensed by the ultrasonic sensor and the sensed data is sent as the feedback signal to the ECU. The sensors placed at the lateral side of the vehicle senses the condition of free road and activates the dc motor to rotate towards the free road side direction up to certain time during this vehicle is turned to the free road side and the motor get rotated in the opposite direction to move the vehicle in the free road.</p>
Outcomes	<p>Published “Emergency Steering System to Avoid Collision By Using Microprocessor Controller”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.</p>

Project Batch No	A15
Project Team	Deepan.R, Gokul Krishna.R, Gokula Krishnan.Y
Project Title	Analysis and Performance Improvement of Heat Sink using PCM
Project Guide	Mr. A. Sivaramakrishnan
Abstract	<p>Over the past decade, the research on the Phase Change materials (PCM) has been widely done and the application of these cost efficient and easily available material has not yet found it's place in the engineering sector. The purpose of this project is to use the PCM to analyze and enhance the performance of the heat sinks which is used in various electronic cooling applications. Heat sinks are widely used as a heat transfer device in electronic devices such as laptops, Computers etc. Due to the increased day to day usage of these electrical devices , the power consumption has been increased in a drastic way when compared to the past decade. Almost all the sectors are now dependent on these electrical devices for their day to day work. When Phase Change Material (PCM) is introduced into the Heat sink device, it is believed to enhance the performance thereby increasing the thermal efficiency of the Heat sinks in various electronic cooling applications. The thermal performance of the heat sinks is reviewed in this paper. Alongside with the thermal parameters of Heat sinks, application of the PCM in electrical devices is also presented in this project.</p>

Outcomes	.Published “Analysis And Performance Improvement of Heat Sink Using PCM - A Review”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.
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Project Batch No	A16
Project Team	Enos Joel Makarios J
Project Title	Design of Electric Drive Train for Assessment of EV Performance Targets using Sim center Amesim
Project Guide	Mr. S Rajesh Kannan
Abstract	At present, the focus of automobile OEMs (Original Equipment Manufacturers) is the design and development of Electric Vehicles (EVs) due to various reasons such as government regulations, emission requirements, increase in fuel cost and making them future proof etc. In an electric vehicle various component like motor, battery, controllers are used. Battery and Motor are the main components for defining the whole working of the vehicle. In the process of developing the equipment’s, an important issue is related to defining the performance targets. In the current project, based on the critical targets defined, an optimal sizing of battery and motor is done to achieving the set targets using model-based engineering approach.
Outcomes	Published “Design of Electric Drive Train for Assessment Of EV Performance Targets Using Sim center Amesim”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	A17
Project Team	S Joseph Roy Lenin, R Joseph Agnel Romario, M Kishore Kumar
Project Title	Study of Heat Transfer Properties in Automobile Coolant using Nano-Fluid
Project Guide	Mr. D Muralikrishnan
Abstract	<p>Considering the emerging trends and challenges in automobile sector's thermal management, we developed a metallic Nano fluid to effectively transfer heat from engine. Nano fluids have attracted the attention as a new generation of heat transfer in automobile cooling application because of their excellent thermal behavior. This project deals with the preparation of Copper Aluminate Nano particles and characterization of the Nano particle. Nano fluids are prepared by dispersing nanometer-sized particles in a base fluid such as water, ethylene glycol, and other conventional heat transfer fluids. The Nano particles are added to the base fluid under different fractions from 0.1, 0.3, 0.5 and 0.7% to find the effective heat transfer rate in engine as coolant. The results discussed and compared shows a significant change in temperature while using the Nano fluids as coolant.</p>
Outcomes	Published "Study Of Heat Transfer Properties In Automobile Coolant Using Nano-Fluid", National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE' 18.

Project Batch No	A18
Project Team	S.Akilan, J.Augustin Thiraviam Sam, W.Blessly Prince
Project Title	Power Generation from Ventilated Parked Car
Project Guide	Mr. D. Muralikrishnan
Abstract	<p>During summer, the car will experience a high temperature when it is exposed to sunlight. The temperature difference may be around 25°C - 30°C from the ambient temperature. Even air conditioning system takes a while to regulate the heat inside cabin. The high temperature prevailing inside the vehicle is definitely unreceptive to the occupants when they arrive to take a drive. Meanwhile the exposure of plastics to high temperature releases toxic smell may cause respiratory problems in human beings. This project mainly focuses on regulating the heat from the cabin by a new ventilation system. The ventilation system comprises of heat pipes and exhaust fan. The power required to drive the exhaust fan is utilized from the ventilated heat with the help of turbine and generator. Experimental investigation is done on a prototype which is designed and fabricated as similar to a car cabin. In this project along with dissipation of heat, power generation is also done from the waste heat exhausted.</p>
Outcomes	Published “Power Generation from Ventilated Parked Car”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	A19
Project Team	Augustin S
Project Title	An Investigation of Production Loss in Plating Shop
Project Guide	Mr. Nishant B Mayekar
Abstract	<p>Production loss plays a vital role in determining the productivity of a manufacturing industry. It is very much important to identify the process which leads to the production loss, so that the productivity can be increased. The main purpose of this study is to find the current capacity, areas that need to be analyzed and to provide improvement ideas to increase the production. By the method of continuous collection of various data in the shop floor, the present performance as well as the capacity of plant can be determined. Process time is determined in a sequential manner in all the work stations involved in the shop floor and the bottleneck process is identified. Thus the process which contributes most in the production loss is analyzed so that its time can be reduced thereby increase in production.</p>
Outcomes	Published “An Investigation of Production Loss in Plating Shop”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	A20
Project Team	Amuluru Mounick Reddy, Biradavolu Krishnasai, Rakesh.K
Project Title	Brake Failure Indicator and Engine over Heating Alarm
Project Guide	Mr. A Sivaramakrishnan
Abstract	<p>Now a days, Machines are widely controlled by control system. To meet the need of exploding population economic and effective control of machines is necessary. The aim is to design and develop an indication system for indicating brake failure in vehicle and for an indication of excess temperature in an engine. Automatic brake failure indication system consists of push button which functions the buzzer when the contact between brake lever and foot lever gets damaged. Push button activation sends feedback to control unit for activation of buzzer. Similarly the when the engine temperature exceeds its maximum limit, this condition is sensed by a temperature sensor which is placed on the fins of an engine which monitors and displays a temperature status of engine if the temperature gets increased it activates buzzer along with automatic engine off by using pic-microcontroller to guide for spark plug to off the engine and to stop the vehicle for avoiding the damages caused for an engine is been reviewed. This system is applicable for both diesel and petrol engines differentiating by using spark plug guides and ignition system.</p>

Outcomes	Published “Brake Failure Indicator and Engine over Heating Alarm - A Review”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.
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Project Batch No	A21
Project Team	Ashley Varghese John, Aamir Massoud
Project Title	A Novel Bio-Inspired under Actuated Gripper for Precision Manipulation
Project Guide	Mr. V Gopal
Abstract	<p>In the precision industry, Micro positioning is an essential component in the field of micro/nano technology. Applications of micro positioning stage found in various field such as biological manipulation, and scanning probe microscopy, flexure-based compliant stages, optical fiber alignment, single molecule experiment in physics and biology, micromanipulation and micro assembly are popular devices to achieve ultrahigh precision positioning with micro/nanometer-level accuracy. Most of these applications require micrometer or even nanometer accuracy, but conventional mechanisms with motors, gears, and joints cannot meet the requirements mainly due to the backlash, hysteresis, clearance and friction of the joints and the geometric and dimensional errors of the components. This situation leads to the development of compliant micro motion stages which can overcome these difficulties. In the past, many compliant micro motion stages were proposed. In these designs, the motions are</p>

	conveyed by elastic deformations of flexure joints, which have advantages in terms of no backlash, no friction losses, no need for lubrication, ease of fabrication, and virtually no assembly. Design of compliant mechanism is done through kinematic based approach and topology optimization.
Outcomes	Published “A Novel Bio-Inspired Under Actuated Gripper For Precision Manipulation”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	A22
Project Team	Bala Vignesh.A, Dharmaraj. S, Anto Damien.S
Project Title	Effects of Process Parameters in Wire EDM of Inconel 625
Project Guide	Mr. I Manikandan
Abstract	In this project, different parameters of wire EDM are studied. Workpiece material for which parameters are to be optimized is Inconel 625 alloy. In these days it is very important to find best operating conditions for any manufacturing technique. Especially in case of non-conventional machining such as electro discharge machining, abrasive jet machining, electro chemical machining etc., because in these processes operating cost is higher than the conventional machining. Output parameter which is to be optimized is dimensional deviation and input parameters are wire feed,

	pulse off time, pulse on time and wire tension. Taguchi method was used to optimize the parameter. 'L27' orthogonal array was used for statistical analysis. MINITAB-17 software was used to get optimum values for the test and a confirmation experiment was done for validating the results.
Outcomes	Published "Effects of Process Parameters in Wire EDM of Inconel 625", National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE' 18.

Project Batch No	A23
Project Team	Sujith S, Vasanthan R, Vigneshwaran K R
Project Title	Investigation on Characterization of Wear Properties of Al7075
Project Guide	Mr. M Arul Inigo Raja
Abstract	This work investigated the influence of SiC on the wear behaviour of Al 7075/Al ₂ O ₃ hybrid composite. The investigation reveals the effectiveness of incorporation SiC in the composite for gaining wear reduction. Composite materials have revolutionized the field of engineering by giving rise to light weighted and high performance materials in modern engineering applications, For seeing its possibilities this work focuses on fabrication and testing the mechanical and metallurgical properties of composite materials with Aluminum(7075) as base matrix and SiC and aluminum oxide as reinforcement by using stir

	casting which is the most economical. The properties of the materials will have superior mechanical properties analogized to Aluminum base material. The wear properties of the hybrid composites containing the superior wear-resistance properties.
Outcomes	Published “Investigation on Characterization of Wear Properties of A17075”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	A24
Project Team	Vigneshkumar D, Vijay J
Project Title	Elimination of Billet Undersize in Shearing Machine
Project Guide	Mr. I Manikandan
Abstract	The hydraulic shearing machine is fitted with automatic feeding mechanism of bar stock. Due to issue in feeding mechanism the bar stock sheared is short bit and weight undersize. To eliminate this, a motion sensor is fitted to monitor the movement of bar stock. This project is done in "SUPER AUTO FORGE PVT. LTD" Kolapakkam plant, Chennai. To reduce the production downtime due to billet undersize caused in hydraulic shearing machine and also to reduce the wastage in raw materials.
Outcomes	Published “Elimination of Billet Undersize in Shearing Machine”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	B1
Project Team	Vignesh G.S, Mullai Venthan, Sreayus P Mathews
Project Title	Carburizing of Mild Steel using Reduced Graphene Oxide produced from Organic Wastes
Project Guide	Mr. S P Sathya Prasanth
Abstract	The aim of this work is to use carbon produced from domestic sources of carbon compounds like organic wastes to replace industrial carbon compounds used for carburizing and casehardening of steel for improvement of mechanical properties of mild steel. In this case, we synthesized RGO (Reduced Graphene Oxide) from coconut shells, which is widely available as a waste from domestic and oil producing industries. This RGO is then used for carburizing of steel. This method of RGO synthesis will reduce the domestic waste production by creating value for organic wastes for carbon compound extraction to be used in industries. This method creates a whole line of possibilities for the use of organic carbon rich wastes in the industrial side other than recycling and waste to energy.
Outcomes	Published “Carburizing of Mild Steel using Reduced Graphene Oxide Produced from Organic Wastes”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	B2
Project Team	S.Shriram, R.Sundar, S.Vishnu
Project Title	Characterization of Mechanical properties using Small Punch Test

Project Guide	Mr. A Sam Daniel Fenny
Abstract	<p>It is difficult to characterize the mechanical properties of metals accurately that are in the form of thin sheet, small tube and welded tube using conventional tensile test. In this work, a modified small punch test (SPT) method is proposed to characterize the mechanical properties of tubular specimen. The conventional SPT requires flat disc specimen for the characterization that can't be extracted from small tube components considering the smaller radius of curvature of tubes. Hence it is required to design and develop a customized SPT to evaluate the tensile properties of curved specimens. For the design of modified SPT, numerical method is adapted to study the parameters which affect the accuracy of the results such as clamping force, punch feed and curvature of specimen. Preliminary, tensile test experiments as per ASTM-E8 standard are carried out to develop finite element models. The load-displacement curves for various input conditions are extracted and the results are validated by conducting the experiments on modified SPT. The results are well agreed with each other and this method can be used to characterize the mechanical properties of small tubes.</p>
Outcomes	Published "Characterization of Mechanical Properties using Small Punch Test", National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE' 18.

Project Batch No	B3
Project Team	P. Shane Nathanael, P. ShankaraVarma
Project Title	Re-tooling of Valve Guide and Valve Seat Ring Pressing Machine
Project Guide	Dr. S Ramesh
Abstract	<p>Alfing Montagetechnik GmbH (AMT) valve guide and valve seat ring semi-automatic pressing machine is in the production line of Engine Plant, Company X., for pressing the valve seat ring and valve guide into the cylinder head of 1.4-liter Diesel Variant Engine (DV4) since 2008. As the company changed the capacity of the engine from 1.4-liter to 1.5-liter Diesel Variant (DV5) recently, the machine was out of use and a new fully automated machine was brought into production line for pressing valve seat ring and valve guide into the cylinder head of 1.5-liter DV5 engine. The main disadvantage of the new machine is that, rework of 'NOK' cylinder heads is not possible as the machine is fully automated. Hence, there arose a need for modifying the semi-automatic pressing machine in order to rework 'NOK' DV5 cylinder heads. This re-tooling of the semi-automatic pressing machine would also aid in assisting the production of DV5 cylinder heads if the new fully automated pressing machine broke down or is taken for maintenance. The above need made us to re-tool the semi-automatic pressing machine and aid in production with maximum possibility of rework and uninterrupted production of DV5 cylinder heads as well as providing economic benefits to the company.</p>

Outcomes	Published “Re-Tooling Of Valve Guide And Valve Seat Ring Pressing Machine”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.
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Project Batch No	B4
Project Team	T.Saravanan, N.Sivabalaji, E.Suresh Kumar, D.Vignesh
Project Title	Improving Machining Performance by Green Cutting Fluid
Project Guide	Dr. N Pragadish
Abstract	<p>Machining is one of the most fundamental and indispensable process in manufacturing industry. The heat generated in the cutting zone during machining is critical in deciding the work piece quality. Though cutting fluids are widely employed to carry away the heat in machining, their usage poses threat to ecology and the health of workers. Hence, there arises the need to identify the eco-friendly and user friendly alternative to conventional cutting fluids. The present work features a specify study on the application of Nano solid lubricant suspensions in lubricating oil in turning of mild steel with HSS tool. Coconut oil is taken as the base lubricant and copper oxide as suspension. The variation of cutting tool temperatures and the surface roughness of the machined surface with cutting speed and feed are studied with Nano solid lubricants suspensions in lubricating oil. Experiments are conducted in various composition of nanoparticle copper oxide</p>

	suspension (0.5%, 1%, 1.5%) in 1litre of coconut oil.
Outcomes	Published “Improving Machining Performance by Green Cutting Fluid”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	B5
Project Team	S.Nambidoss, Roshan James
Project Title	Analysis of Sodium Release under Pressurised Conditions during a Core Disruptive Accident
Project Guide	Mr. A.U.Meenakshi Sundareswaran
Abstract	<p>Reactor containment building (RCB) can be considered as the ultimate barrier to the environment against activity release in any nuclear plant. Core disruptive accident (CDA) is an important factor that specifies the design basis of a RCB. When a <i>CDA (core disruptive accident)</i> occurs, coolant (in this case, sodium) escapes into the <i>RCB (reactor containment building)</i> with high thermal and pressure loadings. Here, a fundamental approach towards the quantification of thermal and pressure loadings on the RCB during a CDA has been described. Mathematical models have been derived from fundamental conservation principles. Various heating sources for RCB air and RCB wall, has been identified. Computational fluid dynamic models (CFD) have also been created and a brief comparison between the two has been done. The RCB must be built in such a way that it withstands the</p>

	tremendous load of temperature and pressure. The pressure difference between the inlet and exit of the escape path can be found out by network analysis, CFD, parametric analysis.
Outcomes	Published “Analysis of Sodium Release under Pressurized Conditions during a Core Disruptive Accident”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	B6
Project Team	Seeni Mohammed, Muhammad Khalid, Vishnupriya
Project Title	Mitigating Car Cabin Air Temperature using Hybrid Energy Source
Project Guide	Mr. A. Venkatesan
Abstract	<p>When a vehicle is parked under the direct sun, the accumulated heat is affecting many interiors inside the vehicle cabin, such as the vinyl materials of the dashboard, the leather covers and the electronic components. The objective of the project is to reduce the cabin air temperature in a parked vehicle using a hybrid energy source which uses a TEC (thermo electric cooler) and solar panel. This utilizes the temperature difference between the inside cabin temperature is converted into electrical energy and charging the battery which in turn helps to drive the ventilation system in the car by continuous replenishment of battery power.</p>

Outcomes	Published “Mitigating Car Cabin Air Temperature using Hybrid Energy Source”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.
	Participated in IET Intra-departmental Project Challenge-2018 competition organised by students chapter of IETKCTECH.

Project Batch No	B7
Project Team	Raghul Krishna R, Ranjith V, Syed Ansari Z
Project Title	Mechanical Fuse for Overhead Power Lines
Project Guide	Mr. A.U.Meenakshi Sundareswaran
Abstract	Overhead power lines have chances to fall down which can cause severe damages to human and other living organism. It can also lead to fire accidents thus creating unsafe environment. There are many recorded cases of power line failure leads to fatality. Mostly power lines cuts down during rain, contact of power line with the stagnated water in roads leads to unpredictable damage to lives. Till now there is not an effective safety setup to handle overhead power line. A new mechanical setup is implemented in the power lines which interrupts power transmission in case of cut down of power lines. In case the power line cuts the mechanism is actuated and interrupts the power transmission to the damaged line. Thus many lives and property are saved.

Outcomes	Published “Mechanical Fuse for Overhead Power Lines”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.
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Project Batch No	B8
Project Team	S.P.Muralibalaji, A.Nithyanandham, V.Senthilmurugan, D.Vijayanandhan
Project Title	Experimental Study of Cutting Forces in End Milling of Magnesium AZ31B Alloy in Dry Cutting Condition
Project Guide	Mr. K Gobivel
Abstract	<p>Magnesium AZ31B is a wrought alloy, they having the characteristics like good room temperature strength and ductility. It finds an application in wide variety of uses including aircraft fuselages, cell phone and laptop cases etc., In this research work, the cutting parameters have been investigated, during the end milling of magnesium AZ31B alloy under dry cutting condition. In this study three cutting force components is investigated i.e. (feed forces, thrust forces and cutting forces) were measured to understand the material deformation characteristics. This operation was performed by varying cutting speed, feed rate and constant depth of cut and this work is done in the conventional vertical milling machine with the carbide inserts.</p>

Outcomes	Published “Experimental Study of Cutting Forces in End Milling of Magnesium Az31B Alloy in Dry Cutting Condition”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.
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Project Batch No	B9
Project Team	A.T. Saravanan
Project Title	First Time Quality Reduction in Nozzle used in CRI
Project Guide	Mr. J.PresennaPrabhu
Abstract	<p>Delphi TVS Diesel System Private Limited produces common rail diesel fuel injection system. There are various sections in this company; Nozzle department in this company produces single groove, double groove and triple groove nozzle, based on the different model of the vehicle. The nozzle to the injector of common rail diesel fuel injection system. In the nozzle soft section there are three main machines are used for the production of nozzle, namely the Tsugami, Fanuc, ECM. This company being a continuous production line, the quality of the product is to be within a certain limit or there should be no rejections of component, this is technically called as First time quality. The rejection percentage or the FTQ is high in Tsugami machine. A Tsugami machine is a six axis CNC lathe used for the production of nozzle. So the aim of our project is reduce the rejection percentage or FTQ by making use of Quality Control story approach a management</p>

	<p>tool the seven steps to solve a problem, thus the First Time Quality is reduced by using the quality control approach. Thus it reduces the rejection cost, rework cost for the component and it increases the quality of the nozzle.</p>
Outcomes	<p>By doing this project, student have learnt</p> <ul style="list-style-type: none"> • about the production of nozzles used in common rail Diesel fuel injection system. • to identify the factors which leads to increase in rejection percentage and rework. • to apply management tool to reduce the rejection rate and to increase the quality of the nozzle.

Project Batch No	B10
Project Team	Siddharth G V
Project Title	Design of Jig for Hub Bearing and Bolt Pressing for Various Hubs in Hydraulic Machine
Project Guide	Mr. J.PresennaPrabhu
Abstract	<p>This Company X produces trucks of various types and sizes. Front axle department in this company produces 8 bolt and 10 bolt hub, based on the different model of vehicle. These hubs are attached to the wheels of the truck and are used to hold the wheel, axle and brake system. Bolts of 8 or 10 numbers are attached to the holes that are present in the hub using a hydraulic pressing machine. This pressing action on 8 and 10 bolt hubs are done on 2 separate hydraulic press. This</p>

	company being a continuous production line, when the hub model changes it takes extra time for shifting the work from one press machine to another. This accounts for extra work and affects the production time. So we have designed a jig that replaces the stock jig. This new jig is a radially adjustable jig, which is controlled by a Rack and Pinion mechanism and it is capable of performing pressing actions on both 8 bolt and 10 bolt hubs in a single hydraulic press. This eliminates the extra work and continues the production in a single line with greater time saving.
Outcomes	Published “Design Of Jig For Hub Bearing And Bolt Pressing For Various Hubs In Hydraulic Machine”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	B11
Project Team	M.Nandha Kumar, S.Subilesh
Project Title	Performance Analysis on Steering Assembly to Improve Durability in C-EPS Tilt and Telescope Endurance Tester
Project Guide	Mr. M Sivashankar
Abstract	Electric power steering offers greater vehicle safety by adapting variable steering ratios to human needs, filtering drive train influences and even adjusting active steering torque in critical situations. In addition, it can make cars even lighter and more fuel efficient when compared to those using hydraulic steering systems The

	Steering gets affected during various conditions of vehicles, such as load, unload and stationary. Due to the load effect on steering, it may break. Hence, we are doing Performance Test of Steering. The performance test undergoes Lever up and down, Column up and down. These four processes are operated using pneumatic cylinders. When we replace the one part of Pneumatic cylinder with servomotor, the accuracy is increased and time can be saved.
Outcomes	<p>By doing this project, students in the team have learnt</p> <ul style="list-style-type: none"> • about the Electric power steering and its advantages. • to conduct performance analysis on steering assembly. • to use telescopic endurance tester in testing steering assembly.

Project Batch No	B12
Project Team	Mansoor.A.G, Michael Roshan, Manikandan.S, Samuvel.V
Project Title	Experimenting the Effectiveness of Heat-Pipe using a Peltier Module
Project Guide	Mr. Aaron.Mathews.Oommen
Abstract	The microelectronics industries are shifting towards heat-pipes for CPU cooling applications. Heat-pipes have shown a considerable increase in the rate of heat transfer compared to heat-sink cooling which makes them suitable for computer cooling applications. Due to their flexibility in

	<p>size and thickness, they are also integrated in laptops for cooling. Generally, in laptops, DC powered fans are used at condenser section of heat-pipes to condense the vapors inside the condenser section. Since the condensing capacity is limited by the speed and size of the fan, the condensing capacity at condenser section is reduced. Many scholars have done researches to optimize the working of heat-pipes by using a Nano-fluid as a working fluid. Some of the scholars have also done researches on TEC assessed vapor chambers (working mechanism is similar to that of heat-pipes) which are also used in electronics cooling, but, to the author's knowledge, no work has been done on integrating peltier module at the condenser section of the heat-pipe. This project will focus on experimenting the assessment of peltier module at condenser section of the heat-pipe to study the heat transfer rate, efficiency and combined effectiveness. The obtained results will be compared to fan cooling and heat-sink cooling.</p>
Outcomes	Published "Experimenting the Effectiveness of Heat-Pipe using a Peltier Module", National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE' 18.

Project Batch No	B13
Project Team	S. Suriya
Project Title	A Study of Optimization of Lignite Size Reduction in Lignite Handling System

Project Guide	Mr. M Manoj
Abstract	To Study the processes taking place in lignite handling system (LHS) TPS II EXPANSION. The process is to reduce the lignite received from mine- II of size 500 mm is to be reduced to size of 10 mm. The size reduction takes place in two stages in primary and secondary crushers. After that the screening process takes in screen house and above 10 mm size lignite are again send to secondary crusher for further crushing. By studying all these processes, we conclude that the size of 10mm can be obtained in the secondary crusher itself. By eliminating the screen house, we can save more quantity of power consumption, time consumption & Man power savings which increases the production rate.
Outcomes	By doing this project, student have learnt <ul style="list-style-type: none"> • about the need for getting Lignite coal in 10mm size. • to eliminate screen house and able to get coal to the required size in the secondary crusher itself, thereby increasing production rate.

Project Batch No	B14
Project Team	Sanjay R, Sakthivel V, Vignesh R, Nandha Kumar M. Surya S
Project Title	Permanent Magnet Assist Motor
Project Guide	Mr. M Sivashankar
Abstract	This project presents aspects of design and development of permanent magnet rotor and its

	<p>setup. In conventional induction motor the power consumption is more due to the induced current in the armature setup. In order to reduce the induced current power consumption a permanent magnet motor is designed in such a way with alternate poles of magnet with minimum air gap to create a magnetic flux with the AC stator field windings both the stator and rotors magnetic flux react with each other and produce a torque. This setup does the work with low power consumption as it only needs the power for stator field windings and it eventually eliminates the induced current in the normal conventional induction motor since it doesn't have the armature coil setup rather the power is obtained with the help of neodymium permanent magnet. This project also provides the load test result of this permanent magnet rotor setup.</p>
Outcomes	<p>Published “Design and Development of Permanent Magnet Rotor”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE' 18.</p> <p>Participated in IET Intra-departmental Project Challenge-2018 competition organised by students chapter of IETKCTECH.</p>

Project Batch No	B15
Project Team	Surya K, Vimalkumar U, Vishmudev A V
Project Title	Experimental Study of Car Suspension using Permanent Magnets
Project Guide	Dr. D Easu

Abstract	This work deals with the influence of magnetic repulsive force between two permanent magnets on the vibration reduction of a car suspension. Two Neodymium magnets are placed in a Maruti front wheel suspension in place of rubber bush and tested in a test rig. The non linearity in the stiffness of the permanent magnets are determined and the influence on the response of the top plate is studied experimentally. Also, the response is studied theoretically in MATLAB simulink for various stiffness and damping combination. Both theoretical and experimental results show the performance of magnetic suspension is better than the conventional suspension system.
Outcomes	Published “Influence Of Magnetic Repulsion On Vibration Reduction In A Car Suspension”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	B16
Project Team	Wesley Joel K, Vivek S, Siddharth D, Sudharsun G A
Project Title	Surface Texturing by Wire-cut EDM on Cutting Tool
Project Guide	Mr. S Jesudass Thomas
Abstract	Recent researches in the field of dry machining have indicated that surface texture has the potential to influence tribological conditions. Researchers have studied the application of controlled surface micro textures on cutting tool

	<p>surfaces to improve machining performance by changing the tribological conditions at the interfaces of tool-chip and tool-work piece. An experiment to study the performance of the micro-textured Un-coated carbide tool inserts implemented in the machining of Inconel 718 samples was carried out. Parallel, Perpendicular and Areal surface textures were introduced using Wire-cut Electrical discharge machining on the face of Un-coated carbide tool inserts. Machining in dry conditions was applied on Inconel 718 using lathe machine with micro-textured cutting tool inserts for varying range of feed, depth of cut, cutting speeds. Measurement of cutting force, cutting temperature and surface roughness of the work surfaces after machining were made. In this project, the experiments were conducted based on the established Taguchi's technique, L27 orthogonal array using Minitab-17 statistical software. The effect of Micro textured cutting tool inserts in the turning operation of Inconel 718 were studied and the outcomes of the experimental study are presented in this project.</p>
Outcomes	<p>Published "Surface Texturing By Wire-Cut EDM on Cutting Tool", National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE' 18.</p>

Project Batch No	B17
Project Team	M Magendran, B Mohammed Insha, S Mohammed Nainar, T Yashwanth

Project Title	Performance Studies Of In-house Developed Rapid Prototyping Machine
Project Guide	Dr. S Ramesh
Abstract	<p>Rapid prototyping is a group of techniques used to quickly fabricate a scale model of a physical part or assembly using three dimensional computer aided design (CAD) data. Construction of the part or assembly is usually done using 3D printing. 3D PRINTING is a form of additive manufacturing technology where a three dimensional object is created by laying down successive layers of material. 3D Printing is based on fused deposition modelling technique, which is one of the newly developed rapid prototyping process for the fabrication of parts. 3D printer allows the designers to produce the model in a very short time and also in precise form. There are various types in design we choose the delta type and we designed and fabricated because the moving parts are lightweight so that its easier to travel. That results in faster printing with greater accuracy. A Rapid prototype machine is developed in-house for meeting out the volume of 170*170*340mm capacity. The components are brought out from different Suppliers and other parts are machined and fabricated. Electrical control components are developed by our electrical instrumentation team. The machine is investigated in different parameters to check its performance. Additive machine can use polymer or other different materials to print a range of functional component, including complex structure that cannot be manufactured by other means. The use</p>

	of additive manufacturing can potentially benefit a wide range of industries including defence, aerospace, bio-medical, consumer products.
Outcomes	Published “Performance Studies of In-house Developed Rapid Prototyping Machine”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	B18
Project Team	Nicky Paul Eapen, G.Periasamy, S.Pearlin Shiju
Project Title	Experimental and Numerical Analysis of Buckling of an Aluminium Tube under Axial Load
Project Guide	Mr. L Prince Jeyalal
Abstract	Crashworthiness characteristics of thin-walled aluminium tubes with holes and slots which serves as crush initiators are experimentally and numerically studied. Crush initiators causes stress concentrations which are intentionally introduced into structural members in order to trigger their collapse. These stress concentrations have the effect of reducing the peak buckling load as well as controlling the collapse mode of an energy absorbing structure. The experiment is done to investigate the load management and energy absorption characteristics of these structural members.

Outcomes	Published “Experimental and Numerical Analysis of Buckling of an Aluminium Tube under Axial Load”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.
	Published “Numerical Investigation of The Collapse Behaviour of Thin Walled Metal Tubes Under Axial Impact” International Conference, Organized by VelTech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology - IDAD-2018

Project Batch No	B19
Project Team	A.R.Vishnuvardhan
Project Title	Performance Analysis of Turbocharged Diesel Engine
Project Guide	Mr. A.Venkatesan
Abstract	Internal combustion engine cycle simulation models have proved to be very effective in evaluating engine performance and also contributing towards saving time and money. Engine models perform comprehensive analysis of thermodynamic processes in an engine. Modeling an engine is affecting engine research at all levels, from a greater insight into an engine process to identifying the key variables controlling the process. Modeling also saves researchers from endeavors in costly experiments. Models have been successful in predicting engine behavior over a wide range of operating parameters with greater accuracy.

Outcomes	<p>By doing this project, student have learnt</p> <ul style="list-style-type: none"> • about IC Engine cycle simulation models in evaluating engine performance. • to develop models of engine and to identify the key variables controlling the thermodynamic process. • to predict engine behavior over a wide range of operating parameters with greater accuracy.
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Project Batch No	B20
Project Team	G.Sanjai Rahul, V.Sreevatsan
Project Title	Performance Analysis of Naturally Aspirated Diesel Engine by Varying Valve Timing
Project Guide	Mr. A.Venkatesan
Abstract	<p>Internal combustion engine cycle simulation models have proved to be very effective in evaluating engine performance and also contributing towards saving time and money. Engine models perform comprehensive analysis of thermodynamic processes in an engine. This project aims at conducting performance analysis of naturally aspirated diesel engine by varying valve timing. Modeling an engine is affecting engine research at all levels, from a greater insight into an engine process to identifying the key variables controlling the process. Modeling also saves researchers from endeavors in costly experiments. Models have been successful in predicting engine behavior over a wide range of operating parameters with greater accuracy.</p>

Outcomes	<p>By doing this project, students in the team have learnt</p> <ul style="list-style-type: none"> • about IC Engine cycle simulation models in evaluating engine performance. • to conduct performance analysis of naturally aspirated diesel engine by varying valve timing. • to predict engine behavior over a wide range of operating parameters with greater accuracy.

Project Batch No	B21
Project Team	Manoj Kumar A, Rathanakumar R, Vignesh R
Project Title	Emission Control in SI Engine utilising H-H-O Gas
Project Guide	Mr. M Manoj
Abstract	<p>In SI engine, atmospheric air blended with petrol is used as a fuel. Atmospheric air contains around 70% Nitrogen and other gases. Since engine intakes these gases more NO_x is produced and the emission of CO, HC, CO_2 is also more. Due to this environment is affected. This title aims to reduce both the emission and the consumption of fuel. We use the combination of hydrogen and petrol as a fuel. Hydrogen is obtained from the process of electrolysis. Electrolysis of water is the decomposition of water to give Hydrogen and Oxygen gas due to an electric current being passed to water. Since water is abundant in</p>

	nature, it is used to produce hydrogen more economically. Hydrogen produced via electrolysis results in zero green house gas emissions. In this project, the engine utilizing a mixture of gasoline and H-H-O as the air fuel mixture. Here emission of CO, HC and CO ₂ is less.
Outcomes	Published “Emission Control in SI Engine utilising H-H-O Gas”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	B22
Project Team	Ajitkumar S, Vignesh E, Surendher T
Project Title	Experimental Investigation on Hardened Material using Small Punch Test and its Characterization
Project Guide	Mr. A Sam Daniel Fenny
Abstract	Small punch test (SPT) is a miniature test method that replaces the conventional tensile test to characterize mechanical properties of any materials. If the volume of available material to be characterized is insufficient to prepare sub-size standard test coupons, the conventional tensile test method can't be used. In this scenario, SPT can be employed to characterize the mechanical properties. The results of SPT are highly sensitive to fixture configurations and testing parameters. To get realistic material characterization, sensitivity of the testing parameters should be studied. Heat treated 304

	Austenitic Stainless steel is used for characterising the mechanical properties. Also the study about contact angle Vs Hardness property has been done. From the obtained stress-strain curve of specimen the load-displacement curve is calculated
Outcomes	Published “Experimental Investigation on Hardened Material Using Small Punch Test And Its Characterization”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE’ 18.

Project Batch No	B23
Project Team	Prince Nissian David R, Narendar R S,Surender P
Project Title	Dual Axis Solar Panel Tracking System
Project Guide	Mr. M Sivashankar
Abstract	Solar energy can be used both directly and indirectly. It can be used directly in a variety of thermal applications like heating water or air, drying, distillation and cooking. The heated fluids can in turn be used for applications like power generation or refrigeration. A second way in which it is converted to electric energy is by indirectly causing the winds to blow, plants to grow, rain to fall and temperature differences to occur from the surface to the bottom of oceans. Useful energy can be obtained for commercial and non-commercial purposes through all these renewable sources. Problem associated with the use of solar energy is that its availability varies widely with time. The variation in availability

	occurs daily because of the day night cycle and also seasonally because of the earth's orbit around the sun.
Outcomes	Published “Dual Axis Solar Panel tracking System”, National Conference on Mechanical, Aeronautical and Civil Engineering - NCMACE' 18.
	Participated in IET Intra-departmental Project Challenge-2018 competition organised by students chapter of IETKCTECH.

Project Batch No	B24
Project Team	L.Sugumaran, V.Murali, V.Kishore
Project Title	Mechanical and Thermal Behaviour of Hybrid Natural Fiber Reinforced Composites
Project Guide	Mr. S P Sathyaprasanth
Abstract	Composite materials are widely used in the many applications due to its low weight to load-bearing capabilities. Nowadays, experimentation on natural fibres is getting popular because of several technical advantages over synthetic fibres such as low density, good strength and high modulus, moderate preparation cost and easiness for handling. This project deals about the evaluation of mechanical and thermal properties of the natural fibre-reinforced hybrid composites using snake grass and sisal fibre using epoxy as the binder. The fabrication of the hybrid composite is carried out using hand layup method with different volume fraction of fibre

	and matrix. The tensile, flexural properties and thermal properties of the hybrid snake grass-sisal fibre-reinforced composites are evaluated for different volume fraction of fibre and matrix.
Outcomes	<p>By doing this project, students in the team have learnt</p> <ul style="list-style-type: none"> • about the application of composite materials due to its low weight. • to fabricate hybrid composite using hand layup method. • to evaluate the mechanical and thermal properties of the natural fibre-reinforced hybrid composites using snake grass and sisal fibre using epoxy as the binder.